Baseline Data of Reproductive System in the JPHC Study

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Hormonal status in the body is closely related to the occurrence of estrogen-related cancers. Baseline survey data about the female reproductive system in JPHC study showed different gynecological and gestational profiles in each study area. Late menarche (15-16 y/o) was characteristic in the rural areas. Earlier gestational age and larger number of children were also more common in the rural areas. Baseline survey data, including gynecological past history, frequency of examination for uterine cancers, and so forth, showed some profile of middle aged women in the different areas in Japan. J Epidemiol, 2001; 11 (Suppl) : S75-S80.

reproductive history, menarche, menopause, prospective cohort study

INTRODUCTION

Japanese show the low incidence of breast cancer, endometrial cancer, and ovarian cancer compared to the Caucasians. Duration and amount of estrogen level is considered to be a risk factor for these cancers 1). Baseline survey of the JPHC study partially clarified the factors which being related to the geographic differences of the above described cancers in the female reproductive system.

METHODS

Information about the female reproductive system was obtained from the female session of two kinds of self-administered baseline questionnaires. Questions about age of menarche, age of menopause, regularity and days of menstruation cycle, any history of hormone therapy, number of pregnancy and children, age of gestation and childbirth, breast feeding, participation to the uterine and/or breast mass screening program, and past history of gynecological diseases were asked.

Several questions in the questionnaires were different in Cohort I and II. In terms of hormone treatment, “Have you ever used female sex hormones in the present or past?” in Cohort I was revised to “Have you ever used female sex hormones for contraception, dysmenorrhea or climacteric distress?” in Cohort II. Gynecological past history was selected from the list of diseases, such as “none, mastopathy, mastitis, mammary tumor, endometritis, uterine myoma, ovarian cyst, vaginitis, and others” in Cohort I, but vaginitis was deleted in Cohort II. The question about mass screening for uterine and mammary cancers was moved to the question for both sexes about an experience to participate to the mass-screening program performed by the local government, such as stomach, lung, colon, uterus and breast in Cohort II.

RESULTS

Age of cohort subjects was from 40 to 59 years in Cohort I and from 40 to 69 years in Cohort II. It may cause systematic bias about age of menarche and number of gestation and children due to the rapid change of society after the World War II. Average age of menarche was 16.4 year and 15.0 year in both area of Okinawa, such as Miyako and Ishikawa, respectively. It was 13.2 years in Suita and 13.4 years in Katsushika (Table 1). In other areas, it was averagely 14 years. Age of menarche in metropolitan areas was earlier than other rural areas, and it was 2-3 years older in Okinawa. On the contrary, age of menopause did not show such clear trend, but almost 2 years difference was present in Cohort I (47.8 years) and Cohort II (49.4 years) (Table 2).

Menstruation cycle was regular in about 80% women in all districts (Table 3a, b). Average menstruation cycle was 28...
### Table 1. Age distribution of menarche.

| Age (yr) | Ninohe | Yokote | Saku | Ishikawa | Katushika | Kasama | Kashiwazaki | Tosayamada | Arikawa | Miyako | Suite 1 | Suite 2 | Total |
|----------|--------|--------|------|----------|-----------|--------|-------------|------------|---------|--------|---------|---------|-------|
| <10      | 0.5    | 0.3    | 0.3  | 0.1      | 1.5       | 0.3    | 0.3         | 0.5        | 0.6     | 0.3    | 0.1     | 0.9     | 0.6   |
| 11       | 1.7    | 0.9    | 1.3  | 0.7      | 5.0       | 1.4    | 1.8         | 3.3        | 1.2     | 1.6    | 0.6     | 5.5     | 3.7   |
| 12       | 9.1    | 8.6    | 8.5  | 4.3      | 20.9      | 9.4    | 10.2        | 16.5       | 9.1     | 3.5    | 22.8    | 16.7    | 10.8  |
| 13       | 19.8   | 17.5   | 16.8 | 14.2     | 28.3      | 21.8   | 15.7        | 25.5       | 17.9    | 9.7    | 31.2    | 26.7    | 20.0  |
| 14       | 26.5   | 23.6   | 24.3 | 23.6     | 25.7      | 30.2   | 28.0        | 27.3       | 30.5    | 17.6   | 25.8    | 25.7    | 25.7  |
| 15       | 21.2   | 25.1   | 22.4 | 23.7     | 13.5      | 22.3   | 24.7        | 16.0       | 23.4    | 21.4   | 10.2    | 15.8    | 20.6  |
| 16       | 10.9   | 11.7   | 11.6 | 14.2     | 3.2       | 8.5    | 8.1         | 6.4        | 9.4     | 14.0   | 2.3     | 5.8     | 9.5   |
| 17       | 5.8    | 5.9    | 6.6  | 9.6      | 1.0       | 3.1    | 5.1         | 2.8        | 4.0     | 10.9   | 1.0     | 2.9     | 5.1   |
| 18       | 2.8    | 4.1    | 4.6  | 5.4      | 0.6       | 2.0    | 4.0         | 1.3        | 2.8     | 10.7   | 0.3     | 1.2     | 3.4   |
| 19       | 0.9    | 1.3    | 2.8  | 2.6      | 0.2       | 0.6    | 1.3         | 0.2        | 0.7     | 6.6    | 0.1     | 0.5     | 1.5   |
| >20      | 0.7    | 0.9    | 0.8  | 1.5      | 0.1       | 0.4    | 0.6         | 0.2        | 0.7     | 4.9    | 0.0     | 0.5     | 0.9   |

Number of subjects: 4651 6034 5207 5235 3933 6653 1000 2642 3819 3341 3563 1541 47619
Mean: 14.4 14.6 14.6 15.0 13.4 14.2 14.4 13.7 14.3 15.7 13.2 13.7 14.3
S.D.: 1.7 1.7 1.8 1.8 1.4 1.5 1.7 1.5 1.6 2.1 1.3 1.6 1.8

### Table 2. Age distribution of natural menopause.

| Age (yr) | Ninohe | Yokote | Saku | Ishikawa | Katushika | Kasama | Kashiwazaki | Tosayamada | Arikawa | Miyako | Suite 1 | Suite 2 | Total |
|----------|--------|--------|------|----------|-----------|--------|-------------|------------|---------|--------|---------|---------|-------|
| <29      | 0.1    | 0.0    | 0.0  | 0.0      | 0.0       | 0.0    | 0.0         | 0.0        | 0.1     | 0.0    | 0.4     | 0.0     | 0.0   |
| 30-34    | 0.2    | 0.1    | 0.2  | 0.3      | 0.3       | 0.1    | 0.2         | 0.0        | 0.2     | 0.1    | 0.2     | 0.2     | 0.2   |
| 35-39    | 1.0    | 0.9    | 1.1  | 1.5      | 2.2       | 0.7    | 0.4         | 0.8        | 0.8     | 1.4    | 1.1     | 0.1     | 1.0   |
| 40-44    | 6.0    | 6.4    | 5.8  | 5.5      | 4.4       | 4.9    | 4.4         | 4.9        | 6.1     | 6.3    | 5.7     | 3.6     | 5.6   |
| 45-49    | 41.7   | 38.9   | 35.7 | 37.9     | 75.4      | 37.2   | 35.9        | 32.9       | 36.6    | 39.5   | 85.6    | 30.7    | 40.6  |
| 50-54    | 48.1   | 50.4   | 54.1 | 52.0     | 17.8      | 54.2   | 54.2        | 58.0       | 52.7    | 49.5   | 7.0     | 60.8    | 49.5  |
| 55-59    | 2.9    | 3.3    | 3.1  | 2.9      | 0.0       | 2.9    | 4.8         | 3.4        | 3.5     | 3.3    | 0.0     | 4.8     | 3.0   |

Number of subjects: 2006 2913 2423 2184 780 2318 454 759 1647 1462 557 691 18194
Mean: 49.0 49.1 49.3 49.2 47.8 49.4 49.7 49.7 49.3 49.0 47.6 50.0 49.2
S.D.: 3.4 3.4 3.5 3.5 2.5 3.2 3.1 3.1 3.5 3.5 2.7 3.0 3.4

### Table 3a. Menstrual cycle.

| Days  | Ninohe | Yokote | Saku | Ishikawa | Katushika | Total |
|-------|--------|--------|------|----------|-----------|-------|
| <19   | 44     | 4.4    | 14   | 1.4      | 38        | 1.0   |
| 20-21 | 43     | 4.3    | 42   | 1.3      | 34        | 0.9   |
| 22-23 | 40     | 4.0    | 59   | 1.9      | 67        | 1.7   |
| 24-25 | 321    | 10.1   | 387  | 12.1     | 440       | 11.4  |
| 26-27 | 218    | 6.9    | 238  | 7.5      | 305       | 7.9   |
| 28-29 | 1863   | 58.8   | 1739 | 54.6     | 2069      | 53.7  |
| 30-31 | 583    | 18.4   | 661  | 20.7     | 836       | 21.7  |
| 32-33 | 20     | 0.6    | 20   | 0.6      | 16        | 0.4   |
| 34-35 | 20     | 0.6    | 26   | 0.8      | 33        | 0.9   |
| >36   | 17     | 0.5    | 14   | 0.4      | 1         | 0.0   |

Total: 3169 3852 3187 4317 2922 17447
Mean: 27.6 27.8 27.7 27.6 28.0 27.7
S.D.: 3.4 3.2 2.6 2.4 2.4 2.8
No answer: 292 655 540 107 122 1716
About 18% women used any hormonal drug in the past or present in Cohort I, but it was less than 10% in Cohort II (Table 4a, b). Number of gestation was 3.1 (2.7-3.9) in Cohort I, and 3.2 (2.6-4.4) in Cohort II. It was high in rural areas such as Miyako and Arikawa, and low in metropolitan city (Table 5). Number of delivery was 0.5 smaller than that of pregnancy. Age of first delivery was younger in Tohoku (23 years of age), and it was 25 years in Katsushika, Suita and Saku (Table 6). Average number of delivery was 2.6 (Table 7). Number of children was 1-2 in 46.7% and 3-4 in 39.3%. More than 7-8 children were reported in Arikawa (4.3%), Ishikawa (3.3%) and Miyako (3.7%), while the other areas were less than 1%. Age of first childbirth was 20-24 in 45.8% women and 25-29 in 42.4% women in average (Table 8). In general, more than half women in rural areas tended to deliver at younger age, while it was reverse in large city, such as Katsushika (Tokyo) and Suita. Saku showed the urban pattern, although it belonged primarily to agricultural district. Proportion of women who had delivered after age 40 years was also high in both districts of Okinawa, Ishikawa and Miyako.

Breast-feeding was reported by 81.6-93.9% mother (Table 9a, b). It exceeded 90% in Kashiwazaki, Arikawa and Miyako in Cohort II.

Proportion of mass-screening examinees within one year was 37.8-56.3% for uterine cancer, and 17.6-54.2% for breast cancer (Table 10a, b).

Gynecological past history was not present in 62-77% women, 70.7% in Cohort I and 65.2% in Cohort II in average (Table 11a, b). Uterine myoma, mastitis, vaginitis, mastopathy, and ovarian cyst were common diseases in the past history. The frequency was different by cohort areas. Diagnosis of uterine myoma was more frequent in Cohort II, especially in Tosayamada (18%) and Suita (17%). Vaginitis was reported from about 5% women in Saku and Katsushika. Past history of mammary tumor was less than 1% except for Suita.

### Table 3b. Menstrual cycle.

| Days | Kasama | Kashiwazaki | Tosayamada | Arikawa | Miyako | Suita 1 | Suita 2 | Total |
|------|--------|-------------|------------|---------|--------|--------|--------|-------|
|      | n      | %           | n          | %       | n      | %      | n      | %     |
| <25  | 690    | 10.2        | 107        | 12.7    | 248    | 11.3   | 335    | 7.0   |
|      | 26     | 220         | 3.2        | 27      | 3.2    | 58     | 2.6    | 87    | 1.8   |
|      | 27     | 201         | 3.0        | 23      | 2.7    | 74     | 3.4    | 163   | 3.4   |
|      | 28     | 3057        | 45.0       | 408     | 48.3   | 1136   | 51.8   | 2307  | 48.4  |
|      | 29     | 138         | 2.0        | 25      | 3.0    | 50     | 2.3    | 46    | 1.0   |
|      | 30     | 2289        | 33.7       | 240     | 28.4   | 550    | 25.1   | 1765  | 37.0  |
| >31  | 193    | 2.8         | 15         | 1.8     | 75     | 3.4    | 66     | 1.4   |
|      | Total  | 6788        | 845        | 2191    | 4769   | 4272   | 2679   | 1928  | 23472 |
| Mean | 28.4   | 28.1        | 28.3       | 28.5    | 28.3   | 28.3   | 28.0   | 28.4  | 28.3  |
| S.D. | 2.3    | 2.4         | 2.8        | 1.8     | 2.1    | 2.3    | 2.3    | 2.2   | 2.2   |
| No answer | 297 | 396 | 477 | 40 | 170 | 117 | 14 | 1511 |

### Table 4a. Take of hormone drug.

| Hormone therapy | Ninohe | Yokote | Saku | Ishikawa | Kashiwazaki | Kasama | Kashiwazaki | Tosayamada | Arikawa | Miyako | Suita 1 | Suita 2 | Total |
|-----------------|--------|--------|------|----------|-------------|--------|-------------|------------|---------|--------|--------|--------|--------|-------|
| None            | 3537   | 4656   | 4026 | 4173     | 3246        | 8621   | 1476        | 3422       | 5504    | 3932   | 3136   | 2150   | 47879 |
| Past            | 995    | 1090   | 919  | 933      | 606         | 491    | 44          | 313        | 220     | 156    | 351    | 160    | 6278  |
| Now             | 84     | 92     | 92   | 114      | 59          | 43     | 4           | 48         | 18      | 51     | 27     | 20     | 652   |
| Total           | 4616   | 5838   | 5037 | 5220     | 3911        | 9155   | 1524        | 3783       | 5742    | 4139   | 3514   | 2330   | 54809 |
| No answer       | 257    | 445    | 440  | 77       | 73          | 404    | 121         | 213        | 474     | 1130   | 68     | 59     | 3761  |

### Table 4b. Take of hormone drug.

| Hormone therapy | Ninohe | Yokote | Saku | Ishikawa | Kashiwazaki | Kasama | Kashiwazaki | Tosayamada | Arikawa | Miyako | Suita 1 | Suita 2 | Total |
|-----------------|--------|--------|------|----------|-------------|--------|-------------|------------|---------|--------|--------|--------|-------|
| None            | 76.6   | 79.8   | 79.9 | 79.9     | 83.0        | 94.2   | 96.9        | 90.5       | 95.9    | 95.0   | 89.2   | 92.3   | 87.4  |
| Past            | 21.6   | 18.7   | 18.2 | 17.9     | 15.5        | 5.4    | 2.9         | 8.3        | 3.8     | 3.8    | 10.0   | 6.9    | 11.5  |
| Now             | 1.8    | 1.6    | 1.8  | 2.2      | 1.5         | 0.5    | 0.3         | 1.3        | 0.3     | 1.2    | 0.8    | 0.9    | 1.2   |
| Total           | 4616   | 5838   | 5037 | 5220     | 3911        | 9155   | 1524        | 3783       | 5742    | 4139   | 3514   | 2330   | 54809 |
| No answer       | 257    | 445    | 440  | 77       | 73          | 404    | 121         | 213        | 474     | 1130   | 68     | 59     | 3761  |
### Table 5. Number of pregnancy.

| Pregnancy n | Ninohe | Yokote | Saku | Ishikawa | Katsushika | Kasama | Kashiwazaki | Tosayama | Arikawa | Miyako | Suita 1 | Suita 2 | Total |
|-------------|--------|--------|------|----------|------------|--------|-------------|----------|---------|--------|---------|---------|-------|
| 0           | 5.1    | 5.1    | 4.8  | 7.4      | 6.8        | 4.8    | 3.3         | 7.3      | 6.5     | 4.5    | 8.9     | 8.6    | 6.0   |
| 1-2         | 31.6   | 41.7   | 28.7 | 14.9     | 38.8       | 46.6   | 33.9        | 4.2      | 17.5    | 13.9   | 40.8    | 36.0   | 32.7  |
| 3-4         | 45.9   | 44.6   | 54.2 | 40.1     | 42.4       | 42.3   | 53.9        | 41.5     | 44.8    | 41.9   | 40.2    | 41.1   | 44.2  |
| 5-6         | 14.3   | 7.6    | 11.3 | 27.6     | 10.8       | 5.9    | 8.4         | 8.0      | 24.2    | 30.4   | 8.9     | 12.6   | 13.9  |
| 7-8         | 2.8    | 0.7    | 0.9  | 7.9      | 1.1        | 0.4    | 0.5         | 0.9      | 5.6     | 7.7    | 1.0     | 1.4    | 2.6   |
| 9-10        | 0.3    | 0.2    | 0.1  | 1.8      | 0.1        | 0.0    | 0.2         | 0.2      | 1.2     | 1.4    | 0.2     | 0.3    | 0.5   |
| 11-         | 0.1    | 0.0    | 0.0  | 0.3      | 0.0        | 0.0    | 0.1         | 0.1      | 0.3     | 0.2    | 0.1     | 0.1    | 0.1   |

Number of subjects: 4606
Mean: 3.1
S.D.: 1.6

### Table 6. Age of first pregnancy.

| Pregnant age (yr) | Ninohe | Yokote | Saku | Ishikawa | Katsushika | Kasama | Kashiwazaki | Tosayama | Arikawa | Miyako | Suita 1 | Suita 2 | Total |
|-------------------|--------|--------|------|----------|------------|--------|-------------|----------|---------|--------|---------|---------|-------|
| <19               | 10.0   | 3.0    | 1.3  | 9.5      | 3.9        | 2.7    | 1.8         | 6.9      | 6.1     | 5.3    | 2.6     | 2.2     | 4.8   |
| 20-24             | 59.9   | 64.0   | 40.3 | 47.9     | 44.7       | 52.4   | 62.5        | 61.5     | 58.7    | 55.3   | 47.2    | 47.2    | 52.9  |
| 25-29             | 25.6   | 29.2   | 51.4 | 30.5     | 41.1       | 39.1   | 31.9        | 26.0     | 28.7    | 31.6   | 42.0    | 43.0    | 35.3  |
| 30-34             | 3.6    | 2.8    | 5.8  | 9.0      | 7.8        | 4.7    | 3.3         | 4.6      | 5.1     | 5.6    | 6.4     | 6.4     | 5.5   |
| 35-39             | 0.9    | 0.9    | 1.1  | 2.5      | 2.4        | 1.0    | 0.3         | 0.9      | 1.2     | 1.8    | 1.7     | 0.9     | 1.4   |
| >40               | 0.1    | 0.0    | 0.1  | 0.5      | 0.2        | 0.1    | 0.2         | 0.2      | 0.2     | 0.1    | 0.2     | 0.2     | 0.2   |

Number of subjects: 4305
Mean: 23.3
S.D.: 3.4

* Only women who had ever experienced pregnancy.

### Table 7. Number of child birth.

| Children n | Ninohe | Yokote | Saku | Ishikawa | Katsushika | Kasama | Kashiwazaki | Tosayama | Arikawa | Miyako | Suita 1 | Suita 2 | Total |
|------------|--------|--------|------|----------|------------|--------|-------------|----------|---------|--------|---------|---------|-------|
| 0          | 5.2    | 4.9    | 4.8  | 7.6      | 8.6        | 5.3    | 3.7         | 7.7      | 6.9     | 4.9    | 10.7    | 10.4    | 6.5   |
| 1-2        | 14.2   | 10.4   | 41.8 | 20.2     | 59.9       | 57.5   | 46.4        | 65.6     | 25.2    | 19.6   | 63.7    | 61.6    | 46.7  |
| 3-4        | 45.3   | 33.1   | 50.4 | 46.8     | 30.4       | 35.5   | 47.3        | 25.6     | 48.5    | 52.1   | 24.7    | 27.2    | 39.3  |
| 5-6        | 0.9    | 1.4    | 2.8  | 20.1     | 1.0        | 1.6    | 2.4         | 0.9      | 15.0    | 19.7   | 0.8     | 7.6     | 6.2   |
| 7-8        | 0.7    | 0.1    | 0.2  | 4.2      | 0.1        | 0.0    | 0.2         | 0.1      | 3.6     | 3.4    | 0.1     | 0.1     | 0.1   |
| 9-10       | 0.1    | 0.1    | 0.0  | 1.0      | 0.0        | 0.0    | 0.0         | 0.0      | 0.6     | 0.3    | 0.0     | 0.0     | 0.1   |
| 11-        | 0.0    | 0.0    | 0.0  | 0.0      | 0.0        | 0.0    | 0.0         | 0.0      | 0.1     | 0.0    | 0.0     | 0.0     | 0.0   |

Number of subjects: 4630
Mean: 2.6
S.D.: 1.3

### Table 8. Age of first child birth.

| Birth age (yr) | Ninohe | Yokote | Saku | Ishikawa | Katsushika | Kasama | Kashiwazaki | Tosayama | Arikawa | Miyako | Suita 1 | Suita 2 | Total |
|----------------|--------|--------|------|----------|------------|--------|-------------|----------|---------|--------|---------|---------|-------|
| <19            | 5.7    | 1.2    | 0.6  | 6.0      | 1.2        | 1.2    | 0.6         | 3.2      | 2.5     | 2.4    | 0.8     | 1.0     | 2.4   |
| 20-24          | 56.4   | 55.3   | 30.8 | 44.5     | 34.8       | 43.8   | 52.4        | 57.7     | 53.4    | 51.2   | 36.2    | 37.4    | 45.8  |
| 25-29          | 31.8   | 38.0   | 58.5 | 34.9     | 49.8       | 46.7   | 42.2        | 31.9     | 36.0    | 36.8   | 51.2    | 50.0    | 42.4  |
| 30-34          | 1.8    | 4.0    | 8.6  | 10.9     | 10.9       | 6.7    | 4.1         | 5.9      | 6.2     | 6.8    | 9.3     | 9.9     | 7.4   |
| 35-39          | 1.3    | 1.4    | 1.4  | 3.0      | 3.1        | 1.5    | 0.6         | 1.2      | 1.6     | 2.2    | 2.3     | 1.4     | 1.8   |
| >40            | 0.1    | 0.1    | 0.1  | 0.6      | 0.2        | 0.2    | 0.1         | 0.2      | 0.3     | 0.5    | 0.2     | 0.3     | 0.3   |

Number of subjects: 4313
Mean: 23.9
S.D.: 3.5
### Table 9a. Proportion of breast feeding in Cohort I.

| Breast feeding | Ninohe | Yokote | Saku | Ishikawa | Katsushihka | Total |
|----------------|--------|--------|------|----------|-------------|-------|
| Yes            | 3787   | 87.4%  | 4524 | 82.6%    | 4196        | 87.5% | 4131 | 86.5% | 2903 | 81.6% | 19548 | 85.2% |
| No             | 544    | 12.6%  | 953  | 17.4%    | 600         | 12.5% | 647  | 13.5% | 655  | 18.4% | 3399  | 14.8% |
| Total          | 4331   |        | 5477 |          | 4796        |       | 4778 |       | 3558 |       | 22940 |       |
| No answer      | 58     |        | 63   |          | 53          |       | 14   |       | 19   |       | 207   |       |

### Table 9b. Proportion of breast feeding in Cohort II.

| Breast feeding | Kasama | Kashiwazaki | Tosayamada | Arikawa | Miyako | Suita 1 | Suita 2 | Total |
|----------------|--------|-------------|------------|---------|--------|---------|---------|-------|
| Yes            | 7167   | 85.3%       | 1341       | 91.9%   | 2895   | 83.6%   | 4882    | 93.1% | 3636   | 93.9% | 2638   | 85.6% | 1762 | 86.6% | 24341 | 88.3% |
| No             | 1232   | 14.7%       | 118        | 8.1%    | 568    | 16.4%   | 362     | 6.9%  | 236    | 6.1%  | 448    | 14.4% | 272  | 13.4% | 3236  | 11.7% |
| Total          | 8399   |             | 1459       |         | 3463   |         | 5244    |       | 3872   |       | 3106   |       | 2034 |       | 27577 |       |
| No answer      | 87     |             | 19         |         | 66     |         | 95      |       | 122    |       | 31     |       | 33   |       | 453   |       |

### Table 10a. Participant rate to uterine cancer screening in Cohort I.

| Mass screening | Ninohe | Yokote | Saku | Ishikawa | Katsushihka | Total |
|----------------|--------|--------|------|----------|-------------|-------|
| Yes            | 2039   | 42.7%  | 3011 | 48.1%    | 2891        | 56.3% | 2414 | 46.1% | 1490 | 37.8% | 11845 | 46.7% |
| No             | 2731   | 57.3%  | 3245 | 51.9%    | 2248        | 43.7% | 2827 | 53.9% | 2452 | 62.2% | 13503 | 53.3% |
| Total          | 4770   |        | 6256 |          | 5139        |       | 5241 |       | 3942 |       | 25348 |       |
| No answer      | 103    |        | 27   |          | 338         |       | 56   |       | 42   |       | 566   |       |

### Table 10b. Participant rate to uterine cancer screening in Cohort II.

| Mass screening | Ninohe | Yokote | Saku | Ishikawa | Katsushihka | Total |
|----------------|--------|--------|------|----------|-------------|-------|
| Yes            | 1766   | 37.1%  | 2048 | 32.8%    | 2773        | 54.2% | 1870 | 35.7% | 691  | 17.6% | 9148  | 36.2% |
| No             | 2992   | 62.9%  | 4197 | 67.2%    | 2340        | 45.8% | 3367 | 64.3% | 3244 | 82.4% | 16140 | 63.8% |
| Total          | 4758   |        | 6245 |          | 5113        |       | 5237 |       | 3935 |       | 25288 |       |
| No answer      | 115    |        | 38   |          | 364         |       | 60   |       | 49   |       | 626   |       |

### Table 11a. Past gynecological history in Cohort I.

| Past history    | Ninohe | Yokote | Saku | Ishikawa | Katsushihka | Total |
|-----------------|--------|--------|------|----------|-------------|-------|
| None            | 3739   | 76.7%  | 4427 | 70.5%    | 3435        | 62.7% | 4087 | 77.2% | 2641 | 66.3% | 18329 | 70.7% |
| Mastopathy      | 130    | 2.7%   | 282  | 4.5%     | 369         | 6.7%  | 76   | 1.4%  | 116  | 2.9%  | 973   | 3.8%  |
| Mastitis        | 221    | 4.5%   | 429  | 6.8%     | 466         | 8.5%  | 251  | 4.7%  | 320  | 8%    | 1687  | 6.5%  |
| Mammary gland tumor | 24  | 0.5% | 28   | 0.4%     | 32          | 0.6%  | 17   | 0.3%  | 27   | 0.7%  | 128   | 0.5%  |
| Endometritis    | 535    | 11%    | 881  | 14%      | 954         | 17.4% | 496  | 9.4%  | 602  | 15.1% | 3468  | 13.4% |
| Uterine myoma   | 103    | 2.1%   | 136  | 2.2%     | 204         | 3.7%  | 152  | 2.9%  | 111  | 2.8%  | 706   | 2.7%  |
| Ovarian cystoma | 104    | 2.1%   | 157  | 2.5%     | 162         | 3%    | 97   | 1.8%  | 138  | 3.5%  | 658   | 2.5%  |
| Vaginitis       | 146    | 3%     | 239  | 3.8%     | 280         | 5.1%  | 185  | 3.5%  | 226  | 5.7%  | 1076  | 4.2%  |
| Others          | 81     | 1.7%   | 105  | 1.7%     | 120         | 2.2%  | 134  | 2.5%  | 133  | 3.3%  | 573   | 2.2%  |
| Total           | 4873   |        | 6283 |          | 5477        |       | 5297 |       | 3984 |       | 25914 |       |
| No answer       | 246    |        | 96   |          | 398         |       | 57   |       | 39   |       | 836   |       |
**DISCUSSION**

Active duration of estrogen secretion is closely related to the occurrence of breast, endometrial, and ovarian cancer \(^1\). Higher age of menarche among Japanese was considered to result in low incidence of estrogen-related cancers. Recent studies suggested that the dietary interaction like phytoestrogens modifies the effect of estrogen to reduce the risk of cancer and other gynecological distress \(^4\).

Proportion of many answers by women in Cohort I and II was different. The age of subjects in Cohort I was between age 40 and 59, while that in Cohort II was from age 40 to 69. This 10-year difference in age 60s reflected the dramatic change of lifestyle among Japanese around the World War II. Number of gestation, pregnancy, and children had changed after the war. Age of menarche and first pregnancy was different in rural and urban areas. Saku is known as an area of high education, so attitude of women seemed to be similar to those in urban city.

Mortality of uterine cervical cancer was steadily dropped since 1960. After the mass screening program was installed in 1983, high screening rate could decrease the mortality rate to 5/10,000 by early treatment \(^7\). However, the participation rates to mass screening test was less than half in most areas. The education for hygiene and improvement of housing condition had contributed more to decrease the incidence rate. Rate of endometritis, vaginitis and uterine myoma in the past history varied much by area. The chance to go to gynecologists may be a factor to cause such difference, because the rural areas showed relatively high proportion to have had above diseases in the past history. Mammary tumor also showed the same trend, and only Suita subjects reported the tumor in more than 1%.

Cancer registration system has been made in each cohort area and works in high quality, so the risk and preventive factors could be more clearly shown based upon the histologically verified cases. Extension of the epidemiological study to osteoporosis and climacteric distress may be also possible in the JPHC Cohort in the future, if the proper diagnosis could be collected at the time of follow-up study.

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