

FREQUENCY OF CONSANGUINEOUS MARRIAGES IN JAPAN: GEOGRAPHICAL VARIATIONS

Yoko IMAIZUMI and Nobuo SHINOZAKI

*Institute of Population Problems, Ministry of Health and Welfare
of Japan, Kasumigaseki, Tokyo 100, Japan*

Summary The frequency of consanguineous marriages in eight districts of Japan is described based on a nation-wide survey of consanguineous marriages which was conducted on June 1 in 1972 through questionnaires. The rate of first cousin marriages was higher in Kyushu than Hokkaido, Kinki and Shikoku districts in each married year group.

INTRODUCTION

According to Imaizumi *et al.* (1975), the frequency of consanguineous marriages decreased as the year of marriage became more recent in the whole of Japan. Geographical variations of the frequency of first cousin marriages were also observed among eight districts in Japan (Imaizumi *et al.*, 1975). In Japan, the data on autosomal recessive diseases are usually collected by university hospitals and localized in many cases. Therefore, to estimate the frequency of autosomal recessive genes based on the local data, the frequency of consanguineous marriages of the local population should be used instead of that of the whole of Japan. In this paper, the frequency of consanguineous marriages in eight districts of Japan is described to give basic data for such studies.

MATERIALS AND METHODS

The present study utilizes data from the Sixth Fertility Survey conducted on June 1, 1972 by the Institute of Population Problems, Ministry of Health and Welfare, Japan. In the present survey, 300 census enumeration districts were chosen at random out of 2,040 districts which was the master sample and was chosen at random out of 579,709 districts assigned in the 1970 Population Census of Japan (Bureau of Statistics, Office of the Prime Minister). These 300 districts consisted of 219 urban (city) and 81 rural (*gun*) areas. The total number of relevant couples was 9,525. Questionnaires were distributed to all of them. Of the 9,525 cases,

Received June 26, 1983; revised version received July 28, 1984

Table 1. Frequency of consanguineous marriages in eight districts of Japan according to married year of the couple.

District	Married year	F=0	1/16	1/32	1/64	>0	UK	Total	1st cousin marriages (%)	Total consanguineous marriages (%)	
Hokkaido	-June 1, 1947	36	0	1	0	0	3	40	0	2.50	
	June 2, 1947-June 1, 1952	78	4	0	0	0	3	85	4.71	4.71	
	June 2, 1952-June 1, 1957	107	2	0	1	2	3	115	1.74	4.35	
	June 2, 1957-June 1, 1962	111	0	0	0	1	2	114	0	0.88	
	June 2, 1962-June 1, 1967	105	1	0	0	0	3	109	0.92	0.92	
	June 2, 1967-June 1, 1972	100	0	0	0	0	3	103	0	0	
	Unknown	5	0	0	0	0	0	5	—	—	
	Total	542	7	1	1	3	17	571	1.23	2.10	
	Tohoku	-June 1, 1947	60	6	3	1	1	2	73	8.22	15.07
		June 2, 1947-June 1, 1952	118	7	1	0	3	4	133	5.26	8.27
June 2, 1952-June 1, 1957		148	5	3	2	2	8	168	2.98	7.14	
June 2, 1957-June 1, 1962		167	1	2	4	4	6	184	0.54	5.98	
June 2, 1962-June 1, 1967		146	1	0	1	3	6	157	0.64	3.18	
June 2, 1967-June 1, 1972		144	4	1	1	2	3	155	2.58	5.16	
Unknown		3	0	0	0	0	1	4	—	—	
Total		786	24	10	9	15	30	874	2.75	6.64	
Kanto		-June 1, 1947	110	3	2	4	5	3	127	2.36	11.02
		June 2, 1947-June 1, 1952	218	13	1	2	4	17	255	5.10	7.84
	June 2, 1952-June 1, 1957	277	7	2	4	6	16	312	2.24	6.09	
	June 2, 1957-June 1, 1962	472	7	3	5	4	17	508	1.38	3.74	
	June 2, 1962-June 1, 1967	602	4	4	3	2	18	633	0.63	2.05	
	June 2, 1967-June 1, 1972	505	8	3	2	8	11	537	1.49	3.91	
	Unknown	38	1	1	0	0	4	44	—	—	
	Total	2,222	43	16	20	29	86	2,416	1.78	4.55	
	Chubu	-June 1, 1947	103	8	2	8	4	8	133	6.02	16.54
		June 2, 1947-June 1, 1952	195	17	0	6	6	7	231	7.36	12.55
June 2, 1952-June 1, 1957		294	7	2	5	7	11	326	2.15	6.44	
June 2, 1957-June 1, 1962		326	3	7	3	4	16	359	0.84	4.74	
June 2, 1962-June 1, 1967		374	3	1	4	4	8	391	0.77	2.30	
June 2, 1967-June 1, 1972		387	1	0	3	4	12	407	0.25	1.97	
Unknown		12	0	0	0	0	2	14	—	—	
Total		1,691	39	12	29	26	64	1,861	2.10	5.70	

FREQUENCY OF CONSANGUINEOUS MARRIAGES

Kinki	-June 1, 1947	92	6	1	0	4	8	111	5.41	9.91
	June 2, 1947-June 1, 1952	174	6	0	5	4	25	214	2.80	7.01
	June 2, 1952-June 1, 1957	195	8	3	3	5	15	229	3.49	8.30
	June 2, 1957-June 1, 1962	313	7	2	4	2	21	349	2.01	4.30
	June 2, 1962-June 1, 1967	310	2	1	1	5	14	333	0.60	2.70
	June 2, 1967-June 1, 1972	334	1	0	2	8	17	362	0.28	3.04
	Unknown	21	0	0	1	0	3	25	-	-
	Total	1,439	30	7	16	28	103	1,623	1.85	4.99
	-June 1, 1947	41	4	1	3	0	2	51	7.84	15.69
	June 2, 1947-June 1, 1952	66	2	2	0	0	2	72	2.78	5.56
June 2, 1952-June 1, 1957	90	0	2	3	2	2	99	0	7.07	
June 2, 1957-June 1, 1962	80	0	0	2	1	4	87	0	3.45	
June 2, 1962-June 1, 1967	90	0	2	1	1	2	96	0	4.17	
June 2, 1967-June 1, 1972	87	1	0	2	5	3	98	1.02	8.16	
Unknown	3	0	0	0	1	4	8	-	-	
Total	457	7	7	11	10	19	511	1.37	6.85	
Shikoku	-June 1, 1947	20	3	0	3	0	0	26	11.54	23.08
	June 2, 1947-June 1, 1952	33	0	0	0	3	0	36	0	8.33
	June 2, 1952-June 1, 1957	42	0	1	1	1	1	46	0	6.52
	June 2, 1957-June 1, 1962	64	0	0	1	2	0	67	0	4.48
	June 2, 1962-June 1, 1967	69	0	1	1	1	1	73	0	4.11
	June 2, 1967-June 1, 1972	64	0	1	0	1	0	66	0	3.03
	Unknown	0	0	0	0	0	0	0	-	-
	Total	292	3	3	6	8	2	314	0.96	6.37
	-June 1, 1947	74	16	6	5	4	4	109	14.68	28.44
	June 2, 1947-June 1, 1952	126	10	5	9	7	9	166	6.02	18.67
June 2, 1952-June 1, 1957	161	8	3	3	3	4	182	4.40	9.34	
June 2, 1957-June 1, 1962	179	6	5	6	3	11	210	2.86	9.52	
June 2, 1962-June 1, 1967	238	3	1	3	3	9	257	1.17	3.89	
June 2, 1967-June 1, 1972	227	2	2	0	1	7	239	0.84	2.09	
Unknown	13	2	0	0	1	6	22	-	-	
Total	1,018	47	22	26	22	50	1,185	3.97	9.87	
Unknown	June 2, 1947-June 1, 1952	30	0	0	0	0	0	30	0	0

Table 2. Frequency of consanguineous marriages in urban and rural areas according to married year of the couple.

	Married year	Number of couples					Percent of consanguineous marriages					
		F=0	1/16	1/32	1/64	>0	UK	Total	1/16	1/32	1/64	Total
Urban	-June 1, 1947	374	23	10	12	14	18	451	5.10	2.22	2.66	13.30
	June 2, 1947-June 1, 1952	699	32	5	12	14	45	807	3.97	0.62	1.49	7.81
	June 2, 1952-June 1, 1957	933	24	4	11	14	42	1,028	2.33	0.39	1.07	5.16
	June 2, 1957-June 1, 1962	1,316	19	13	16	16	57	1,437	1.32	0.90	1.11	4.45
	June 2, 1962-June 1, 1967	1,543	10	4	6	8	49	1,620	0.62	0.25	0.37	1.73
	June 2, 1967-June 1, 1972	1,480	14	4	8	8	46	1,572	0.89	0.25	0.51	2.93
	Unknown	73	2	1	1	1	11	89	—	—	—	—
Total	6,418	124	41	66	87	268	7,004	1.77	0.59	0.94	4.54	
Rural	-June 1, 1947	162	23	6	12	4	12	219	10.50	2.74	5.48	20.55
	June 2, 1947-June 1, 1952	309	27	4	10	13	22	385	7.01	1.04	2.60	14.03
	June 2, 1952-June 1, 1957	381	13	12	11	14	18	449	2.90	2.67	2.45	11.14
	June 2, 1957-June 1, 1962	396	5	6	9	5	20	441	1.13	1.36	2.04	5.67
	June 2, 1962-June 1, 1967	391	4	6	8	8	12	429	0.93	1.40	1.86	6.06
	June 2, 1967-June 1, 1972	368	3	3	2	9	10	395	0.76	0.76	0.51	4.30
	Unknown	22	1	0	0	1	9	33	—	—	—	—
Total	2,029	76	37	52	54	103	2,351	3.23	1.57	2.21	9.32	
Unknown	June 2, 1947-June 1, 1952	30	0	0	0	0	30	0	0	0	0	

140 (1.5%) were not returned because of traveling (13), absence (33), hospitalization (2) and/or rejection (92) of the persons questioned. Details of the surveys have been reported elsewhere (Imaizumi *et al.*, 1975).

RESULTS

Table 1 shows the frequency of consanguineous marriages in each district according to the year the couple was married. In this table, non-related, first cousin, first cousin once removed and second cousin marriages, and consanguineous marriages excluding the above three types of cousin marriages are indicated as $F=0$, $1/16$, $1/32$, $1/64$ and >0 , respectively. The mean rate of first cousin marriages was higher in the Kyushu than in the Hokkaido, Kinki and Shikoku districts in each year group. With one exception the rate in each year group was higher in the Kyushu than in the Tohoku, Kanto, Chugoku and Chubu districts. An exception is seen in the youngest group for the first three districts and in the group of 1947–1952 for the Chubu district. In the oldest group the mean rate of first cousin marriages was the highest in Kyushu (14.7%) followed by Shikoku (11.5%), whereas it was the lowest in Hokkaido (0%) followed by the Kanto district (2.4%). Therefore, this rate was six times as large in Kyushu as in the Kanto district. On the other hand, in the youngest group, the mean rate of first cousin marriages was the highest in the Tohoku district (2.58%) followed by the Kanto district (1.49%), whereas it was the lowest in Hokkaido (0%) and Shikoku (0%) followed by the Chubu district (0.25%).

Table 2 shows the frequency of consanguineous marriages in urban and rural areas according to year married. Overall frequencies of first cousin, first cousin once removed and second cousin marriages, and other consanguineous marriages were 1.8, 2.7, 2.3 and 1.8 times as large in rural as in urban areas, respectively. In the oldest group, frequency of first cousin marriages was 5.1% in urban areas and 10.5% in rural areas, whereas in the youngest group the rate of first cousin marriages was under 1% in both areas. The rate of first cousin marriages rapidly decreased up to 1962 in both urban and rural areas. After this year, the rate was constant and similar in both areas. On the other hand, the rate of second cousin marriages rapidly decreased for the couples married before 1952, but after this year the rate decreased slowly. The rate in urban areas was similar for married couples after 1962, whereas the rate in rural areas was three times higher in the period of 1962–1967 than in the period of 1967–1972. Therefore, the rate declined more quickly in urban than rural areas and in first cousin than second cousin marriages.

REFERENCES

- Imaizumi, Y., Shinozaki, N., and Aoki, H. 1975. Inbreeding in Japan: Results of nation-wide study. *Jpn. J. Human Genet.* 20: 91–107.