

2. Blood Survey

This survey measured the concentration of dioxins in the blood, a measure considered to be an indicator of long-term exposure to dioxins.

Blood survey results aggregated by area and region are shown in Table 2-1 and Table 2-2 (Reference Values). The concentrations adjusted for age*1) are shown in Table 2-3.

Table 2-1. Concentrations of PCDD+PCDF+Co-PCB in the Blood

(Unit: pg-TEQ/g-fat)

	Osaka Prefecture Nose Town Regions		Saitama Prefecture Regions			Hiroshima Prefecture Fuchu City Regions	
	A region (n=22)	B region (n=15)	A1 region (n=12)	A2 region (n=24)	B region (n=13)	A region (n=16)	B region (n=19)
PCDD+PCDF							
Mean	16	19	16	17	14	15	16
Standard deviation	10	12	6.8	7.2	4.8	5.6	7.1
Median	14	16	14	16	14	15	15
Range	0.87 – 44	7.0 – 57	6.2 – 30	7.0 – 32	1.6 – 22	7.2 – 26	6.3 – 31
Co-PCB							
Mean	11	11	10	9.8	8.1	12	15
Standard deviation	7.5	4.2	5.3	5.0	3.9	5.6	6.9
Median	10	9.9	10	8.9	6.7	11	15
Range	1.6 – 35	5.3 – 20	1.4 – 20	2.7 – 26	3.4 – 15	3.5 – 23	5.7 – 34
PCDD+PCDF +Co-PCB							
Mean	26	30	26	27	22	27	32
Standard deviation	17	14	12	11	8.5	10	13
Median	25	24	26	26	21	26	30
Range	2.5 – 79	13 – 68	7.6 – 51	9.7 – 48	10 – 36	11 – 44	13 – 65

Notes:

1 Isomers that were detected at levels below the lower limit of determination (ND) were assigned a zero value in calculation.

2 The lower limits of determination were as follows:

T₄CDD, T₄CDF: 1 (pg/g-fat), P₅CDD, P₅CDF: 1 (pg/g-fat)

H₆CDD, H₆CDF: 2 (pg/g-fat), H₇CDD, H₇CDF: 2 (pg/g-fat)

O₈CDD, O₈CDF: 4 (pg/g-fat), Co-planar PCB: 10 (pg/g-fat)

Table 2-2. Concentrations of PCDD+PCDF+Co-PCB in the Blood (Reference Values)

(Unit: pg-TEQ/g-fat)

	Osaka Prefecture Nose Town Regions		Saitama Prefecture Regions			Hiroshima Prefecture Fuchu City Regions	
	A region (n=22)	B region (n=15)	A 1 region (n=12)	A2 region (n=24)	B region (n=13)	A region (n=16)	B region (n=19)
PCDD+PCDF							
Mean	17	19	16	17	14	16	17
Standard deviation	10	12	6.4	7.2	4.4	5.3	6.7
Median	14	16	15	17	14	16	15
Range	2.6 – 44	8.0 – 57	7.2 – 30	7.9 – 32	7.6 – 22	8.3 – 26	7.3 – 31
Co-PCB							
Mean	11	11	10	9.8	8.1	12	15
Standard deviation	7.5	4.2	5.2	5.0	3.9	5.6	6.9
Median	10	9.9	10	8.9	6.7	11	15
Range	1.7 – 35	5.3 – 20	1.9 – 20	2.7 – 26	3.4 – 15	3.5 – 23	5.7 – 34
PCDD+PCDF +Co-PCB							
Mean	27	30	27	27	22	28	32
Standard deviation	17	14	11	11	8.1	10	13
Median	25	25	26	27	22	27	30
Range	4.3 – 79	14 – 68	9.1 – 51	11 – 48	11 – 36	12 – 44	14 – 65

Note: Isomers that were detected at levels below the lower limit of determination (ND) were assigned a zero value in calculation.

Table 2-3. Concentrations of PCDD+PCDF+Co-PCB in the Blood (Adjusted for Age)

(Unit: pg-TEQ/g-fat)

	Osaka Prefecture Nose Town Regions		Saitama Prefecture Regions			Hiroshima Prefecture Fuchu City Regions	
	A region (n=22)	B region (n=15)	A1 region (n=12)	A2 region (n=24)	B region (n=13)	A region (n=16)	B region (n=19)
PCDD+PCDF							
Mean	17	19	17	17	14	15	14
Standard deviation	8.5	12	6.9	6.4	5.0	5.9	7.6
Median	15	19	15	15	15	13	13
Range	6.9 – 40	3.7 – 56	7.7 – 29	7.9 – 33	5.3 – 22	7.1 – 28	4.0 – 31
Co-PCB							
Mean	12	11	10	10	9.1	12	13
Standard deviation	5.7	5.3	4.3	3.7	3.7	5.3	7.7
Median	11	11	9.9	9.4	10	11	13
Range	3.1 – 30	1.5 – 23	3.3 – 19	3.8 – 22	1.9 – 17	0.90 – 21	2.0 – 34
PCDD+PCDF +Co-PCB							
Mean	29	30	27	27	24	26	27
Standard deviation	14	15	10	9.0	8.5	10	15
Median	25	31	25	25	25	24	26
Range	15 – 70	5.3 – 66	11 – 49	12 – 46	7.2 – 39	8.0 – 45	6.0 – 66

Note: Concerning adjustment for age

<Correlation between Concentration of Dioxins in the Blood and Various Factors>

The concentration of PCDD+PCDF in the blood and the concentration of Co-PCBs in the blood are considered to be influenced by such factors as age, dietary habits, and birth history. Consequently, the correlation between the concentrations of PCDD+PCDF and Co-PCB in the blood and age, dietary habits, birth history, and smoking history were analyzed in this study. The results indicate that there is a statistically significant correlation between the concentration of PCDD+PCDF or Co-PCB in the blood, and age or the number of years passed since the last child bearing before the survey period. However, no clear correlation was found with dietary habits (frequency of ingestion of shore fish, other fish, beef, pork, chicken eggs, milk, home-grown foods) or smoking history (smoker, passive smoker). It was considered necessary, therefore, to take into account age and the number of years since the last child bearing before the survey period when evaluating concentrations of these substances in the blood. However, larger figures for the number of years since last giving birth before the survey period also meant larger figures for age, and a statistically significant correlation between these two factors was observed. Therefore, it was decided to perform the analysis with figures adjusted only for age, which was a factor applicable to all survey subjects.

The number of survey subjects in each region was 12 to 24 persons, and this was another reason for not adjusting for any factors other than age. The questionnaire survey results also indicated that there were no major differences overall in dietary habits between regions in any of the areas. Thus this factor was considered not to have any significant influence on comparisons between regions. However, it is necessary to note that there were evident differences in women survey subjects in the Nose Town area of Osaka Prefecture with respect to nursing of their children (breast feeding, mixed milk, and artificial milk).

Figure 2-2 shows the relationship between age and concentration of dioxins in the blood, while Figure 2-3 shows the relationship between the number of years since the last child bearing and the concentration of dioxins in the blood.

<Concerning the Method of Adjustment for Age>

First, regression equations for PCDD+PCDF blood concentrations and Co-PCB blood concentrations in the survey subjects (human beings) in the different areas were created.

Table 2-4. Regression Equations for PCDD+PCDF+Co-PCB Concentrations in the Blood

	Regression Equation	Regression Coefficient	Coefficient of Correlation
PCDD+PCDF	Blood concentration = $0.30 \times \text{age} - 0.055$	5% significance	0.28
Co-PCB	Blood concentration = $0.38 \times \text{age} - 9.3$	5% significance	0.47

Based on these regression coefficients, it was hypothesized that each increase of one year in age would increase the PCDD+PCDF blood concentration by 0.30 pg-TEQ/g-fat, and increase the Co-PCB blood concentration by 0.38 pg-TEQ/g-fat. The age of each survey subject was adjusted to 54.2 years, which is the mean age for the entire survey group.

Analysis and Evaluation

A comparison of regions in each area was made in order to investigate environmental factors in exposure to dioxins.

(a) Comparison of Regions

In all three areas, mean and median values for PCDD+PCDF concentrations in the blood and Co-PCB concentrations in the blood in every region were similar (see Table 2-1). Figure 2-1 shows the frequency distribution of concentration in the blood. As shown in Table 2-3, generally the same tendencies were still evident even after adjustment for age.

(b) Isomer Patterns in Dioxin Blood Concentrations

Isomer patterns in PCDD+PCDF+Co-PCB concentrations in blood did not show any large differences between regions. Specifically, PCDD+PCDF made up 51-62% of PCDD+PCDF+Co-PCB in all regions, and Co-PCB made up the remaining 38-49%. By isomer, 1, 2, 3, 7, 8-PeCDD, 2, 3, 4, 7, 8-PeCDF, and 3, 3', 4, 4', 5-PCB accounted for large shares of the total at about 20% each. Tables 2-5-1 to 2-5-3 show the mean concentrations in the blood by isomer for Summary of Blood Survey

Summary of Blood Survey

In all three areas, mean and median values for PCDD+PCDF concentrations in the blood and Co-PCB concentrations in the blood in every region were similar. Generally the same tendencies were still evident even after adjustment for age.

Reference

Concerning the Correlation between Concentration of Dioxins in Blood and Distance of Residence from Waste Incineration Facilities

The main objective of this survey was to evaluate the difference between the regions in the vicinity of waste incineration facilities and the control regions. Therefore, there are constraints on the adequate evaluation of correlations between distance of residence from waste incineration facilities (hereafter simply distance) and concentration of dioxins in blood. An attempt was made to investigate this matter for the Nose Town area in Osaka Prefecture, which has a single waste incineration facility at the center, and the area inside a circle of two-kilometer radius around it was defined as the vicinity region, while the area outside this circle was defined as the control region. The results for the survey subjects in the A region and the B region were analyzed with respect to distance and concentration of dioxins in the blood, but no statistically significant correlation was found. This remained the case even after adjustment for age.

This study was unable to reach any definite conclusion concerning correlation between distance and the PCDD+PCDF concentration in blood.

Figure 2-4 shows the relationship between concentrations in blood and horizontal distances from the Toyono-gun Beautification Center to the residential area.

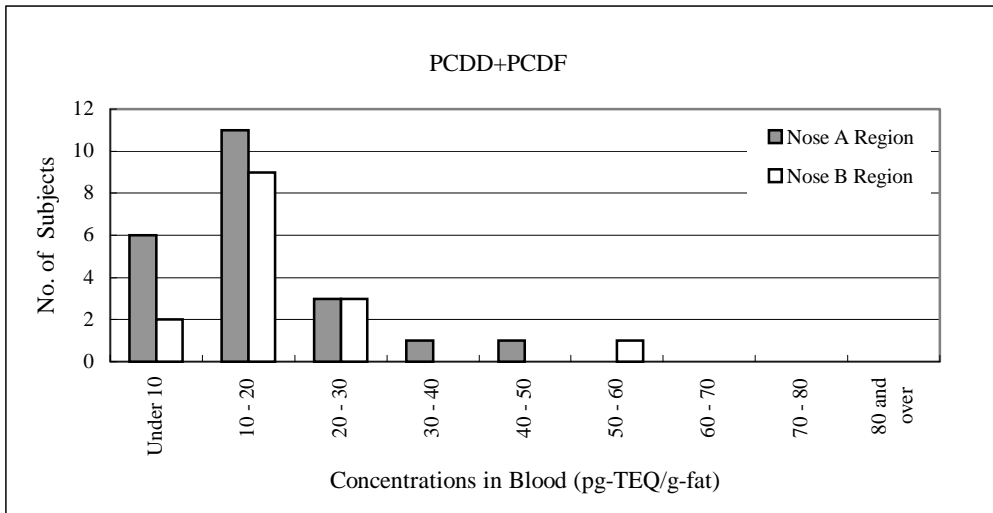


Figure 2-1-1A. Frequency Distribution of Concentrations in Blood (Nose Area • PCDD+PCDF)

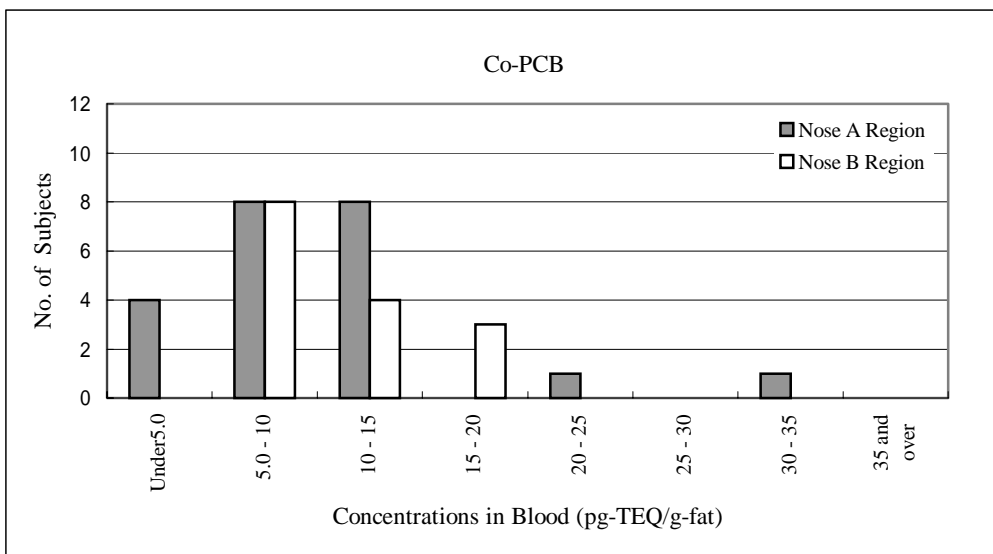


Figure 2-1-1B. Frequency Distribution of Concentrations in Blood (Nose Area • Co-PCB)

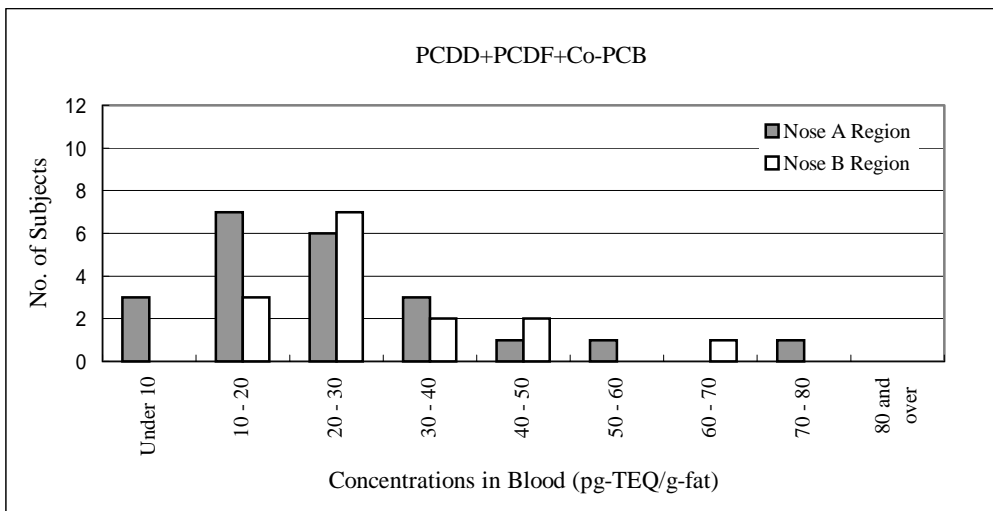


Figure 2-1-1C. Frequency Distribution of Concentrations in Blood (Nose Area • PCDD+PCDF+Co-PCB)

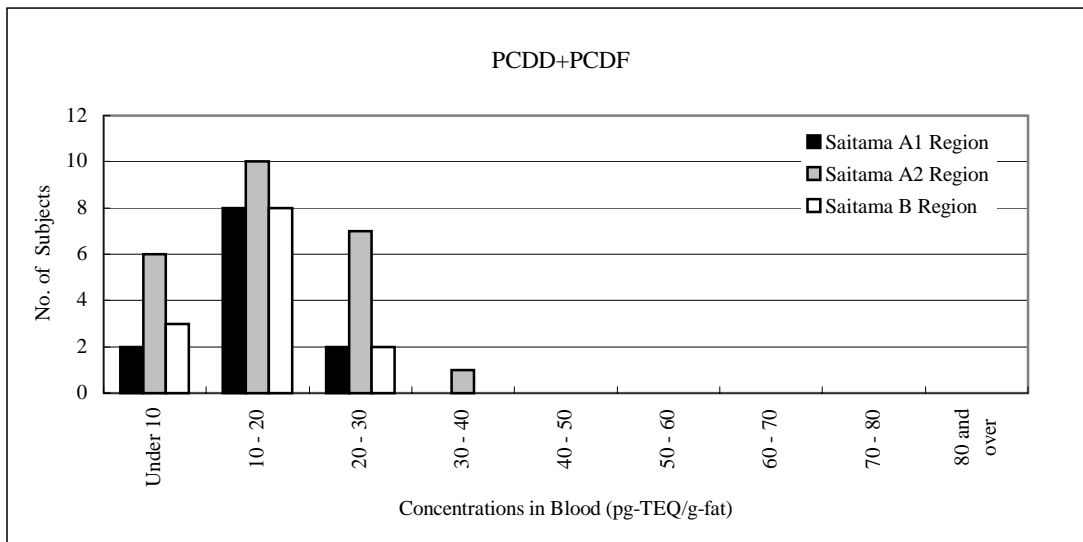


Figure2-1-2A. Frequency Distribution of Concentrations in Blood (Saitama Area • PCDD+PCDF)

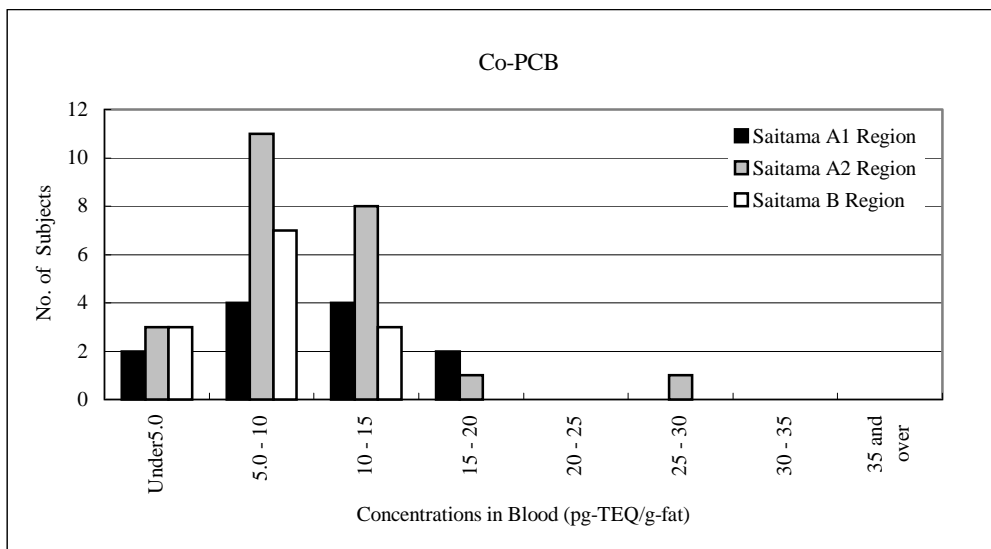


Figure2-1-2B. Frequency Distribution of Concentrations in Blood (Saitama Area • Co-PCB)

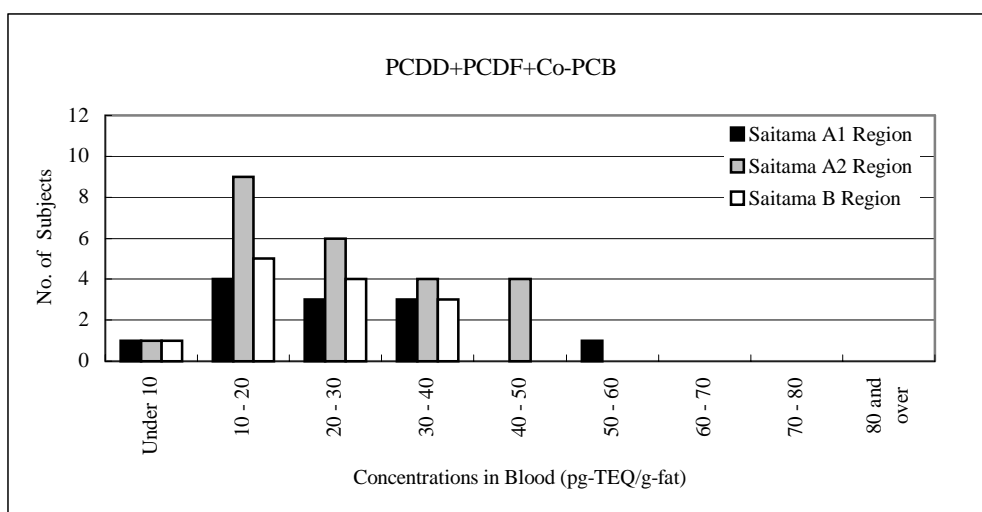


Figure2-1-2C. Frequency Distribution of Concentrations in Blood (Saitama Area • PCDD+PCDF+Co-PCB)

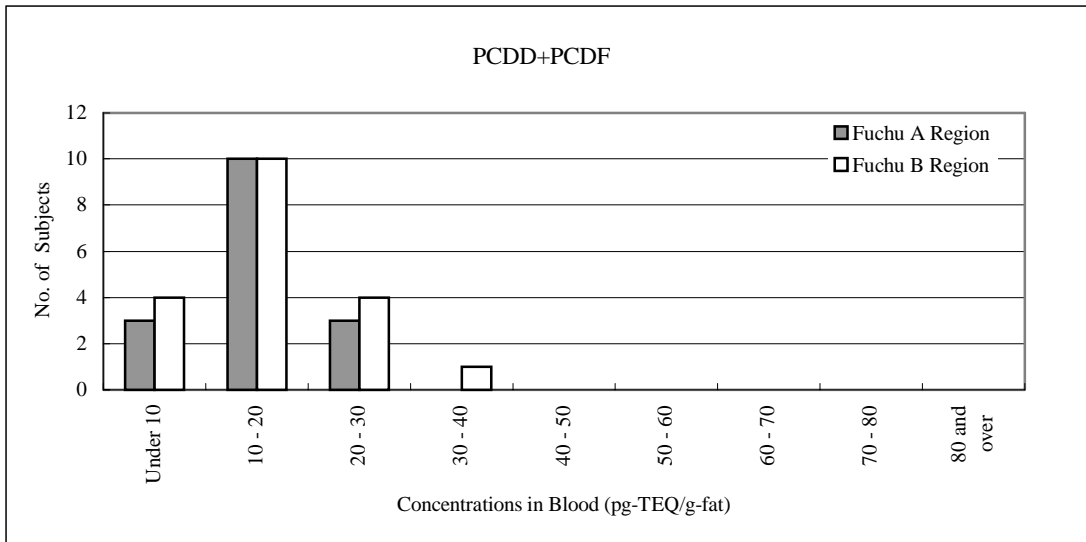


Figure2-1-3A. Frequency Distribution of Concentrations in Blood (Fuchu Area • PCDD+PCDF)

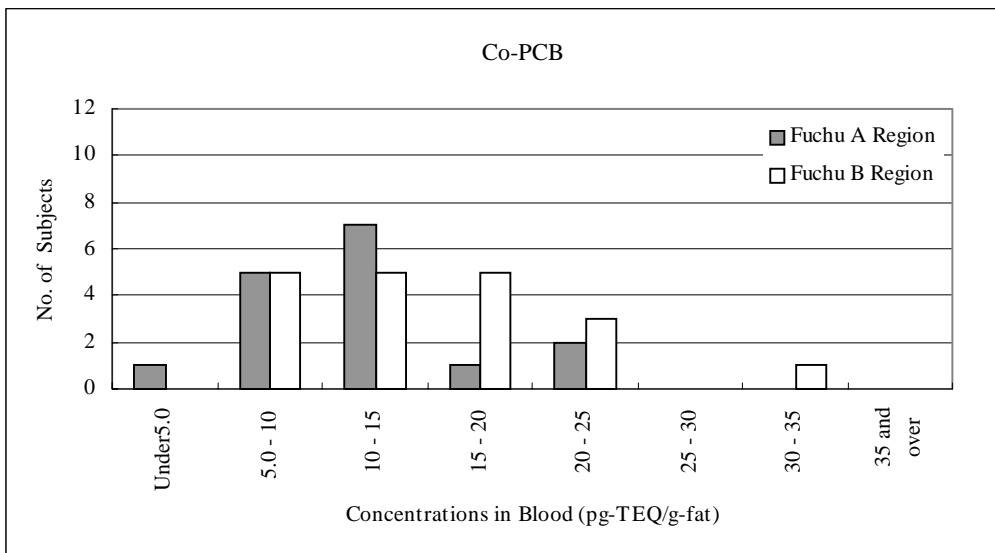


Figure2-1-3B. Frequency Distribution of Concentrations in Blood (Fuchu Area • Co-PCB)

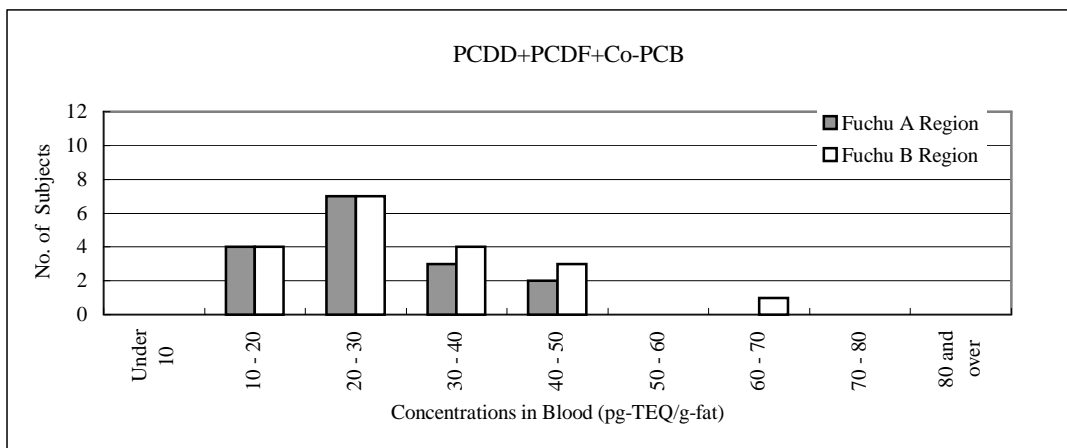
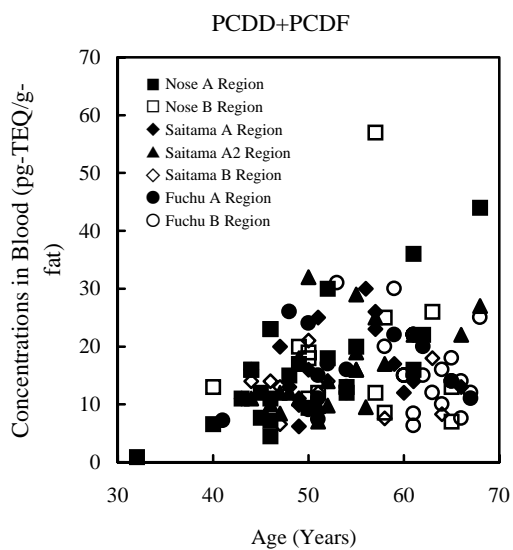
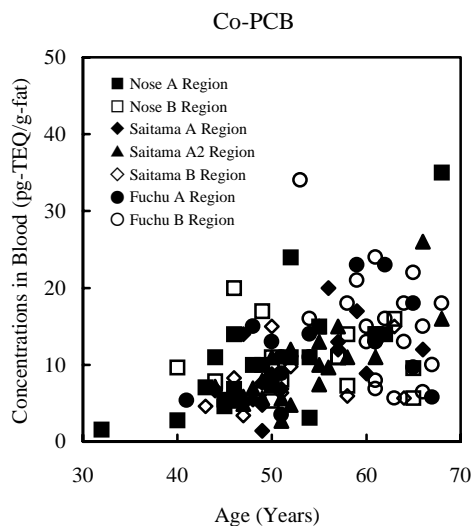


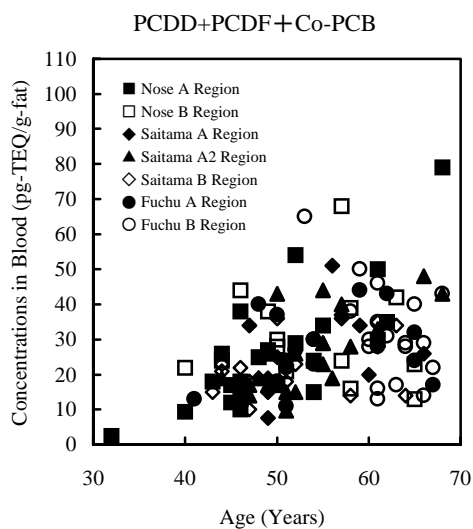
Figure2-1-3C. Frequency Distribution of Concentrations in Blood (Fuchu Area • PCDD+PCDF+Co-PCB)



Regression Equation (All Data)
 $y=0.30x-0.055$ ($p<0.01$)
 Correlation Coefficient
 $R=0.28$



Regression Equation (All Data)
 $y=0.38x-9.3$ ($p<0.01$)
 Correlation Coefficient
 $R=0.47$



Regression Equation (All Data)
 $y=0.68x-9.2$ ($p<0.01$)
 Correlation Coefficient
 $R=0.40$

Figure 2-2. Relationship between Age and Concentration in Blood

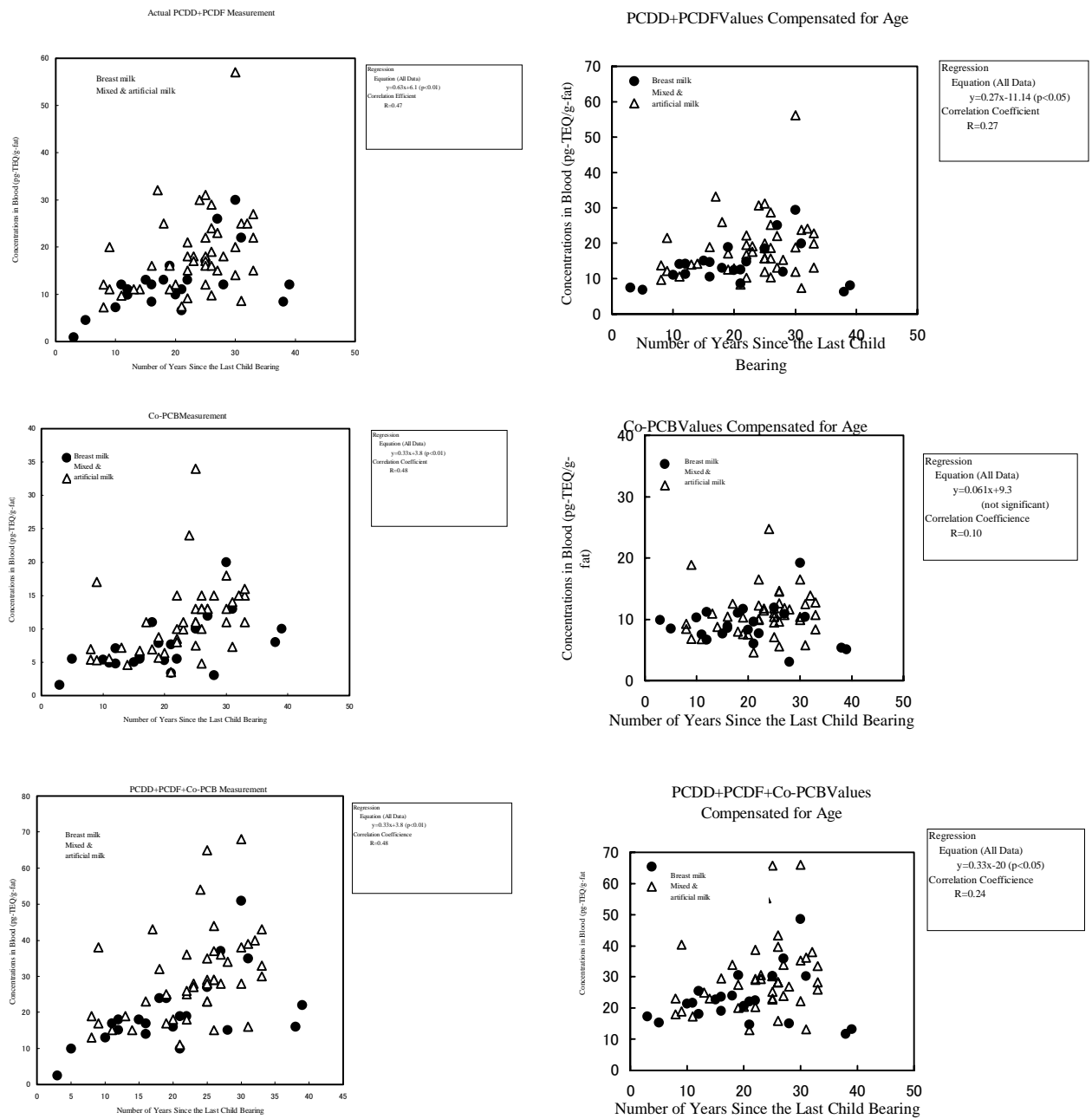


Figure 2-3. Relationship between Concentration in Blood and Number of Years since the last child bearing

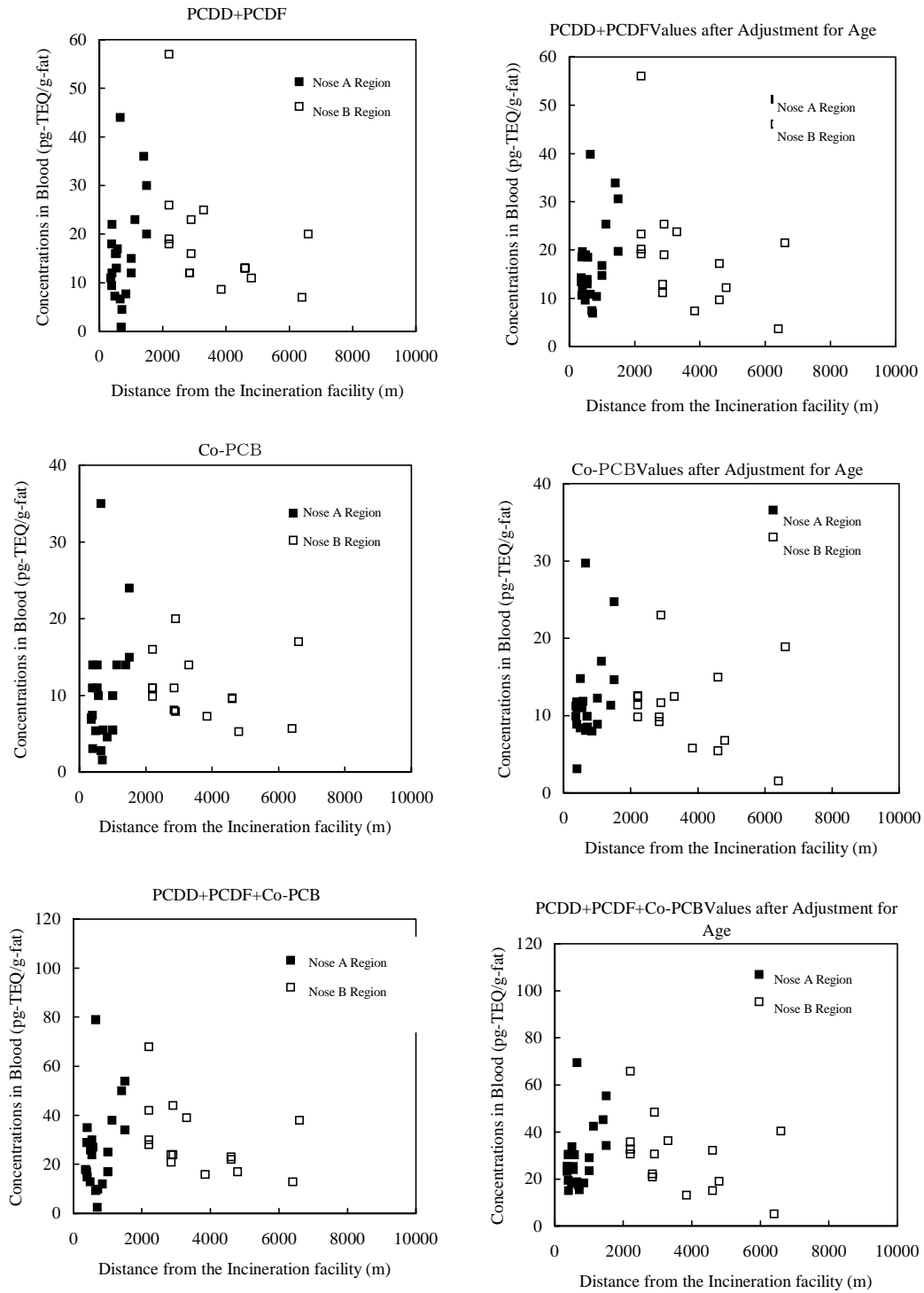


Figure 2-4. Relationship between Concentration in Blood and Horizontal Distance from Toyono-gun Incineration facility to Subject's Residential Area

Table 2-5-1. Fiscal 1999 Mean Concentration in Blood by Isomers in Nose Area (Toxic Equivalent)

Unit: pg-TEQ/g-fat

	Isomer	A Region			B Region			Whole Region		
		Mean	S.D.	%	Mean	S.D.	%	Mean	S.D.	%
PCDD+PCDF	2,3,7,8-TeCDD	0.4545	0.6710	1.72%	0.8000	0.7746	2.67%	0.5946	0.7249	2.13%
	1,2,3,7,8-PeCDD	5.0909	2.9906	19.21%	5.4000	1.9567	18.04%	5.2162	2.5942	18.70%
	1,2,3,4,7,8-HxCDD	0.1545	0.1845	0.58%	0.1600	0.2923	0.53%	0.1568	0.2304	0.56%
	1,2,3,6,7,8-HxCDD	2.7773	1.3925	10.48%	3.2133	1.0914	10.73%	2.9541	1.2812	10.59%
	1,2,3,7,8,9-HxCDD	0.4455	0.3789	1.68%	0.5267	0.3035	1.76%	0.4784	0.3481	1.72%
	1,2,3,4,6,7,8-HpCDD	0.1582	0.1266	0.60%	0.1640	0.1317	0.55%	0.1605	0.1269	0.58%
	OCDD	0.0325	0.0377	0.12%	0.0400	0.0448	0.13%	0.0355	0.0403	0.13%
	Total: PCDD	9.1441	5.3375	34.51%	10.2133	3.8807	34.12%	9.5776	4.7706	34.34%
	2,3,7,8-TeCDF	0.0182	0.0853	0.07%	0.0000	0.0000	0.00%	0.0108	0.0658	0.04%
	1,2,3,7,8-PeCDF	0.0136	0.0640	0.05%	0.0000	0.0000	0.00%	0.0081	0.0493	0.03%
	2,3,4,7,8-PeCDF	5.2273	3.8967	19.73%	6.1000	4.4288	20.38%	5.5811	4.0834	20.01%
	1,2,3,4,7,8-HxCDF	0.4591	0.4239	1.73%	0.6067	0.7507	2.03%	0.5189	0.5739	1.86%
	1,2,3,6,7,8-HxCDF	0.7364	0.6765	2.78%	0.9933	1.5659	3.32%	0.8405	1.1122	3.01%
	1,2,3,7,8,9-HxCDF	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
	2,3,4,6,7,8-HxCDF	0.2500	0.3306	0.94%	0.7400	2.1410	2.47%	0.4486	1.3805	1.61%
	1,2,3,4,6,7,8-HpCDF	0.0700	0.0477	0.26%	0.0713	0.0887	0.24%	0.0705	0.0662	0.25%
	1,2,3,4,7,8,9-HpCDF	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
	OCDF	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
	Total: PCDFs	6.7818	5.3213	25.60%	8.4867	8.7193	28.35%	7.4730	6.8413	26.80%
	Total: PCDD+PCDF	16.0123	10.2758	60.43%	18.7067	12.0738	62.49%	17.1046	10.9583	61.33%
Co-PCB	3,3',4,4'-TeCB	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
	3,4,4',5'-TeCB	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
	3,3',4,4',5'-PeCB	5.5000	4.4481	20.76%	5.4667	2.1668	18.26%	5.4865	3.6562	19.67%
	3,3',4,4',5,5'-HxCB	0.3818	0.2630	1.44%	0.4733	0.3173	1.58%	0.4189	0.2856	1.50%
	Total: non-ortho PCBs	5.9136	4.6925	22.32%	5.9333	2.3588	19.82%	5.9216	3.8741	21.23%
	2,3,3',4,4'-PeCB	0.1840	0.1764	0.69%	0.1905	0.1034	0.64%	0.1866	0.1494	0.67%
	2,3,4,4',5'-PeCB	0.3084	0.2229	1.16%	0.3453	0.1694	1.15%	0.3234	0.2012	1.16%
	2,3',4,4',5'-PeCB	1.0664	0.9779	4.02%	1.1113	0.5521	3.71%	1.0846	0.8227	3.89%
	2',3,4,4',5'-PeCB	0.0522	0.0532	0.20%	0.0501	0.0251	0.17%	0.0514	0.0436	0.18%
	2,3,3',4,4',5'-HxCB	2.4336	1.3934	9.19%	2.5533	1.1307	8.53%	2.4822	1.2780	8.90%
	2,3,3',4,4',5'-HxCB	0.6414	0.3952	2.42%	0.6860	0.3154	2.29%	0.6595	0.3610	2.36%
	2,3',4,4',5,5'-HxCB	0.0203	0.0166	0.08%	0.0211	0.0095	0.07%	0.0206	0.0140	0.07%
	2,3,3',4,4',5,5'-HpCB	0.0586	0.0322	0.22%	0.0593	0.0283	0.20%	0.0589	0.0303	0.21%
	Total: mono-ortho PCBs	4.7514	3.1589	17.93%	4.9933	2.1382	16.68%	4.8495	2.7592	17.39%
	Total: Co-PCB	10.5864	7.5310	39.96%	10.9000	4.2088	36.41%	10.7135	6.3244	38.41%
Total: PCDD+PCDF+Co-PCB	26.4955	17.3801	100.00%	29.9333	14.2752	100.00%	27.8892	16.0743	100.00%	

Table 2-5-2. Fiscal 1999 Mean Concentration in Blood by Isomers in Saitama Areas
(Toxic Equivalent)

Unit: pg-TEQ/g-fat

Isomer	A1 Region			A2 Region			B Region			Whole Region		
	Mean	S.D.	%	Mean	S.D.	%	Mean	S.D.	%	Mean	S.D.	%
2,3,7,8-TeCDD	0.6429	0.8419	2.35%	0.7727	0.8125	2.97%	0.6154	0.6504	2.83%	0.6939	0.7693	2.74%
1,2,3,7,8-PeCDD	5.2857	2.1989	19.29%	5.3182	2.2967	20.43%	4.6154	1.7578	21.20%	5.1224	2.1177	20.25%
1,2,3,4,7,8-HxCDD	0.2571	0.1453	0.94%	0.2500	0.2110	0.96%	0.1000	0.1683	0.46%	0.2122	0.1922	0.84%
1,2,3,6,7,8-HxCDD	2.3571	0.9637	8.60%	2.0545	0.9247	7.89%	1.9077	0.6448	8.76%	2.1020	0.8717	8.31%
1,2,3,7,8,9-HxCDD	0.4857	0.2825	1.77%	0.4045	0.2299	1.55%	0.3154	0.2075	1.45%	0.4041	0.2441	1.60%
1,2,3,4,6,7,8-HpCDD	0.2000	0.1060	0.73%	0.1845	0.0962	0.71%	0.1885	0.1384	0.87%	0.1900	0.1092	0.75%
OCDD	0.0489	0.0418	0.18%	0.0508	0.0646	0.20%	0.0470	0.0533	0.22%	0.0492	0.0549	0.19%
Total: PCDD	9.2571	4.1335	33.79%	9.0636	4.3951	34.82%	7.7385	3.0905	35.55%	8.7673	3.9828	34.66%
2,3,7,8-TeCDF	0.0286	0.0611	0.10%	0.0182	0.0501	0.07%	0.0077	0.0277	0.04%	0.0184	0.0486	0.07%
1,2,3,7,8-PeCDF	0.0321	0.0608	0.12%	0.0114	0.0306	0.04%	0.0077	0.0277	0.04%	0.0163	0.0413	0.06%
2,3,4,7,8-PeCDF	5.6429	2.0702	20.59%	5.4773	2.2755	21.04%	4.3846	1.3716	20.14%	5.2347	2.0415	20.70%
1,2,3,4,7,8-HxCDF	0.5929	0.3198	2.16%	0.5182	0.1842	1.99%	0.4462	0.1391	2.05%	0.5204	0.2245	2.06%
1,2,3,6,7,8-HxCDF	0.8429	0.3936	3.08%	0.7773	0.2991	2.99%	0.6615	0.2103	3.04%	0.7653	0.3113	3.03%
1,2,3,7,8,9-HxCDF	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
2,3,4,6,7,8-HxCDF	0.4214	0.2007	1.54%	0.3136	0.1959	1.20%	0.2692	0.1182	1.24%	0.3327	0.1864	1.32%
1,2,3,4,6,7,8-HpCDF	0.0643	0.0231	0.23%	0.0564	0.0168	0.22%	0.0469	0.0175	0.22%	0.0561	0.0197	0.22%
1,2,3,4,7,8,9-HpCDF	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
OCDF	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
Total: PCDF	7.6286	2.9588	27.84%	7.1773	2.8626	27.57%	5.8231	1.7541	26.75%	6.9469	2.6883	27.47%
Total: PCDD+PCDF	16.8643	6.9548	61.55%	16.2455	7.2138	62.41%	13.6538	4.7754	62.72%	15.7347	6.5751	62.21%
3,3',4,4'-TeCB	0.0011	0.0014	0.00%	0.0002	0.0007	0.00%	0.0002	0.0004	0.00%	0.0004	0.0010	0.00%
3,4,4',5'-TeCB	0.0000	0.0000	0.00%	0.0001	0.0004	0.00%	0.0000	0.0000	0.00%	0.0000	0.0003	0.00%
3,3',4,4',5'-PeCB	6.0000	3.5082	21.90%	5.0455	3.4843	19.38%	4.5385	2.8465	20.85%	5.1837	3.3146	20.50%
3,3',4,4',5,5'-HxCB	0.3500	0.1286	1.28%	0.3955	0.1731	1.52%	0.2846	0.0801	1.31%	0.3531	0.1459	1.40%
Total: non-ortho PCBs	6.4214	3.7143	23.44%	5.4727	3.6701	21.02%	4.7692	2.7657	21.91%	5.5571	3.4541	21.97%
2,3,3',4,4'-PeCB	0.1891	0.1028	0.69%	0.1685	0.1054	0.65%	0.1512	0.0820	0.69%	0.1698	0.0980	0.67%
2,3,4,4',5'-PeCB	0.2882	0.1298	1.05%	0.3086	0.1539	1.19%	0.2077	0.0907	0.95%	0.2760	0.1370	1.09%
2,3',4,4',5'-PeCB	1.1543	0.5510	4.21%	1.0718	0.6203	4.12%	0.9408	0.5255	4.32%	1.0606	0.5711	4.19%
2',3,4,4',5'-PeCB	0.0559	0.0322	0.20%	0.0451	0.0331	0.17%	0.0384	0.0228	0.18%	0.0464	0.0306	0.18%
2,3,3',4,4',5-HxCB	1.8607	0.6851	6.79%	2.1159	0.8915	8.13%	1.5346	0.5490	7.05%	1.8888	0.7798	7.47%
2,3,3',4,4',5'-HxCB	0.5107	0.2004	1.86%	0.6059	0.2679	2.33%	0.4369	0.1573	2.01%	0.5339	0.2314	2.11%
2,3',4,4',5,5'-HxCB	0.0196	0.0090	0.07%	0.0204	0.0101	0.08%	0.0162	0.0070	0.07%	0.0190	0.0090	0.08%
2,3,3',4,4',5,5'-HpCB	0.0445	0.0151	0.16%	0.0506	0.0196	0.19%	0.0356	0.0096	0.16%	0.0449	0.0170	0.18%
Total: mono-ortho PCBs	4.0929	1.6639	14.94%	4.3591	1.9264	16.75%	3.3385	1.2868	15.34%	4.0122	1.7226	15.86%
Total: Co-PCB	10.3571	5.0231	37.80%	9.7409	5.1952	37.42%	8.1308	3.9031	37.35%	9.4898	4.8165	37.52%
Total: PCDD+PCDF+Co-PCB	27.4000	11.0284	100.00%	26.0318	11.3864	100.00%	21.7692	8.4868	100.00%	25.2918	10.6102	100.00%

Table 2-5-3. Fiscal 1999 Mean Concentration in Blood by Isomers
in Hiroshima Prefecture Fuchu Area (Toxic Equivalent)

Unit: pg-TEQ/g-fat

	Isomer	A1 Region			B Region			Whole Region		
		Mean	S.D.	%	Mean	S.D.	%	Mean	S.D.	%
PCDD+PCDF	2,3,7,8-TeCDD	0.6250	0.8062	2.31%	0.9474	0.8481	2.98%	0.8000	0.8331	2.70%
	1,2,3,7,8-PeCDD	5.3125	2.0565	19.63%	5.4211	2.2685	17.05%	5.3714	2.1432	18.13%
	1,2,3,4,7,8-HxCDD	0.0750	0.1390	0.28%	0.1000	0.1414	0.31%	0.0886	0.1388	0.30%
	1,2,3,6,7,8-HxCDD	2.6750	1.0357	9.88%	2.8684	1.0646	9.02%	2.7800	1.0406	9.38%
	1,2,3,7,8,9-HxCDD	0.4125	0.1784	1.52%	0.4474	0.2458	1.41%	0.4314	0.2153	1.46%
	1,2,3,4,6,7,8-HpCDD	0.1456	0.0590	0.54%	0.1474	0.0874	0.46%	0.1466	0.0747	0.49%
	OCDD	0.0211	0.0113	0.08%	0.0214	0.0188	0.07%	0.0213	0.0156	0.07%
	Total: PCDD	9.2063	3.6424	34.02%	9.8789	4.3224	31.08%	9.5714	3.9824	32.30%
	2,3,7,8-TeCDF	0.0125	0.0342	0.05%	0.0158	0.0375	0.05%	0.0143	0.0355	0.05%
	1,2,3,7,8-PeCDF	0.0094	0.0272	0.03%	0.0053	0.0158	0.02%	0.0071	0.0215	0.02%
	2,3,4,7,8-PeCDF	4.8125	2.0238	17.78%	5.6842	2.6099	17.88%	5.2857	2.3679	17.84%
	1,2,3,4,7,8-HxCDF	0.3625	0.1668	1.34%	0.3053	0.2094	0.96%	0.3314	0.1906	1.12%
	1,2,3,6,7,8-HxCDF	0.4188	0.1940	1.55%	0.4316	0.1734	1.36%	0.4257	0.1804	1.44%
	1,2,3,7,8,9-HxCDF	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
	2,3,4,6,7,8-HxCDF	0.1188	0.1424	0.44%	0.0579	0.1216	0.18%	0.0857	0.1332	0.29%
	1,2,3,4,6,7,8-HpCDF	0.0369	0.0108	0.14%	0.0174	0.0119	0.05%	0.0263	0.0150	0.09%
	1,2,3,4,7,8,9-HpCDF	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
	OCDF	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
	Total: PCDF	5.8000	2.5110	21.43%	6.5632	3.0808	20.65%	6.2143	2.8205	20.97%
	Total: PCDD+PCDF	15.0438	5.6414	55.59%	16.4368	7.0584	51.71%	15.8000	6.3963	53.33%
Co-PCB	3,3',4,4'-TeCB	0.0000	0.0000	0.00%	0.0001	0.0002	0.00%	0.0000	0.0002	0.00%
	3,4,4',5'-TeCB	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%
	3,3',4,4',5'-PeCB	6.0625	3.3955	22.40%	8.3684	4.5118	26.32%	7.3143	4.1499	24.69%
	3,3',4,4',5,5'-HxCB	0.3938	0.1611	1.45%	0.4263	0.2077	1.34%	0.4114	0.1859	1.39%
	Total: non-ortho PCBs	6.5125	3.6300	24.06%	8.8737	4.7505	27.91%	7.7943	4.3801	26.31%
	2,3,3',4,4'-PeCB	0.1988	0.1103	0.73%	0.2623	0.1370	0.83%	0.2332	0.1278	0.79%
	2,3,4,4',5'-PeCB	0.3491	0.1684	1.29%	0.4563	0.2011	1.44%	0.4073	0.1920	1.37%
	2,3',4,4',5'-PeCB	1.3669	0.7177	5.05%	1.7053	0.7365	5.36%	1.5506	0.7374	5.23%
	2',3,4,4',5'-PeCB	0.0563	0.0311	0.21%	0.0842	0.0483	0.26%	0.0714	0.0432	0.24%
	2,3,3',4,4',5'-HxCB	2.7906	1.2605	10.31%	3.2053	1.2412	10.08%	3.0157	1.2492	10.18%
	2,3,3',4,4',5'-HxCB	0.7763	0.3766	2.87%	0.8868	0.3436	2.79%	0.8363	0.3581	2.82%
	2,3',4,4',5,5'-HxCB	0.0278	0.0137	0.10%	0.0345	0.0134	0.11%	0.0315	0.0137	0.11%
	2,3,3',4,4',5,5'-HpCB	0.0734	0.0351	0.27%	0.0853	0.0373	0.27%	0.0798	0.0363	0.27%
	Total: mono-ortho PCBs	5.6188	2.4858	20.76%	6.6368	2.4350	20.88%	6.1714	2.4758	20.83%
	Total: Co-PCB	12.1125	5.6403	44.76%	15.4263	6.9238	48.53%	13.9114	6.4977	46.95%
Total: PCDD+PCDF+Co-PCB	27.0625	10.1355	100.00%	31.7895	13.2564	100.00%	29.6286	12.0027	100.00%	