

Figure 4-2 Head circumference for female infants and children (2010)

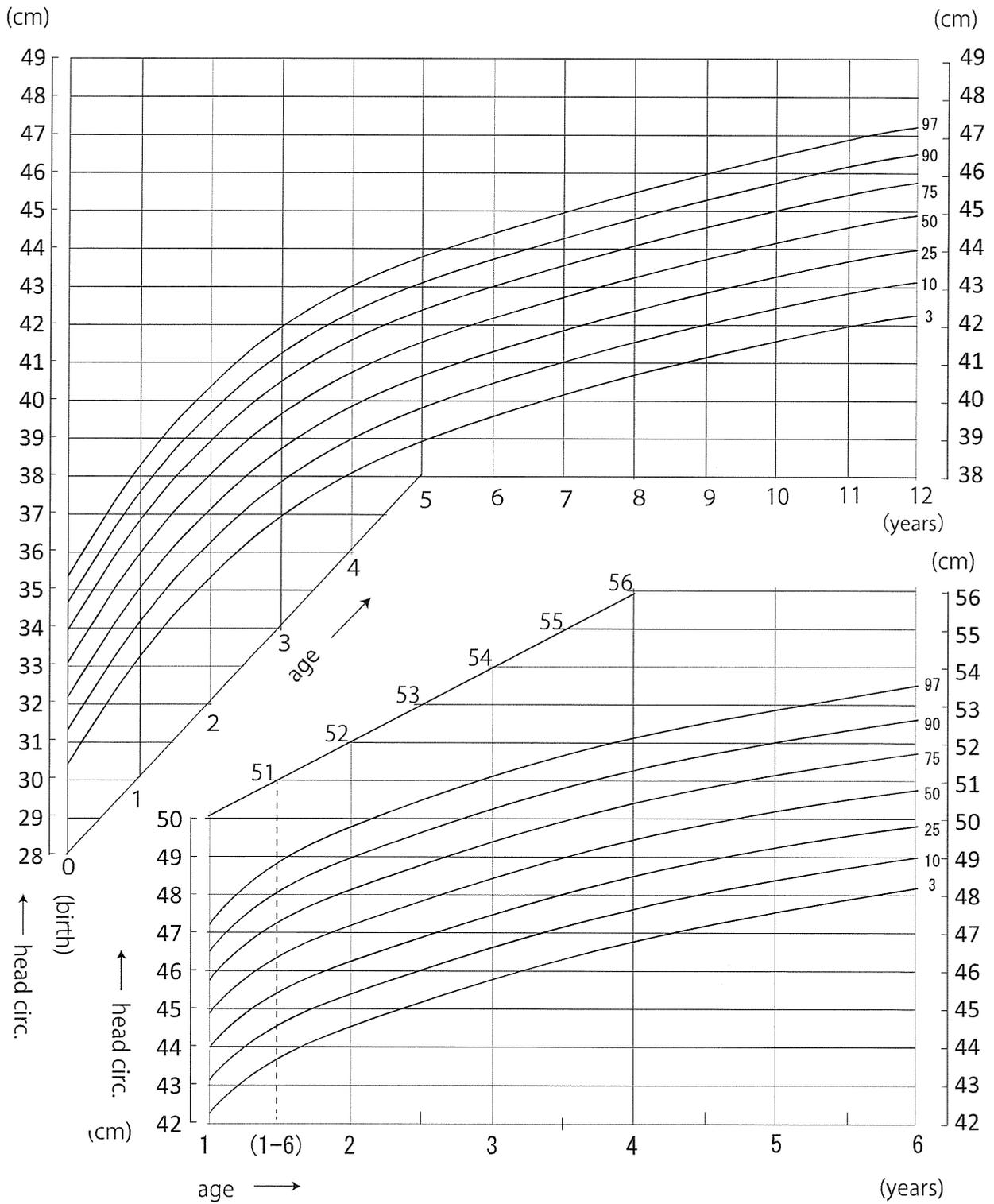
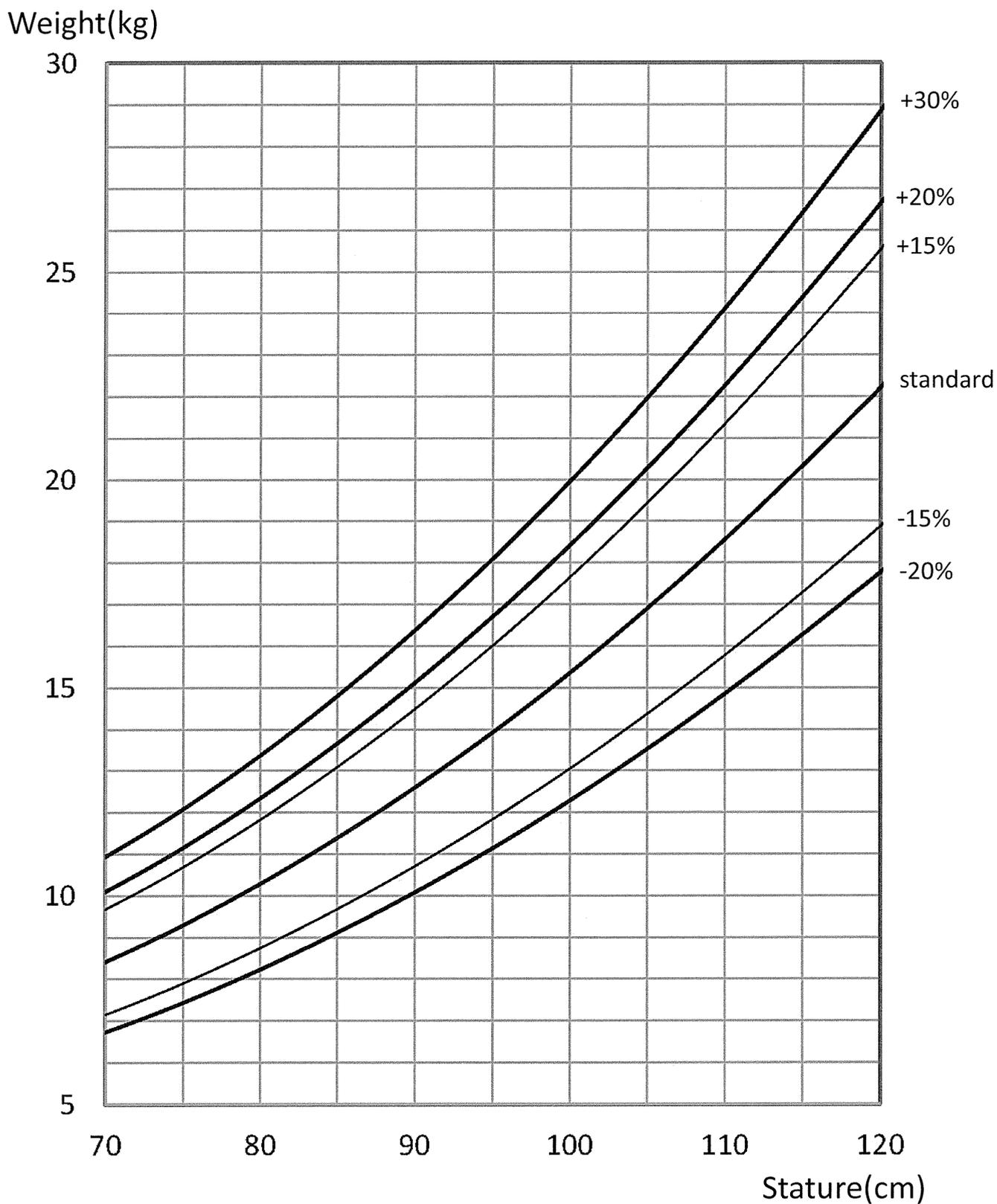
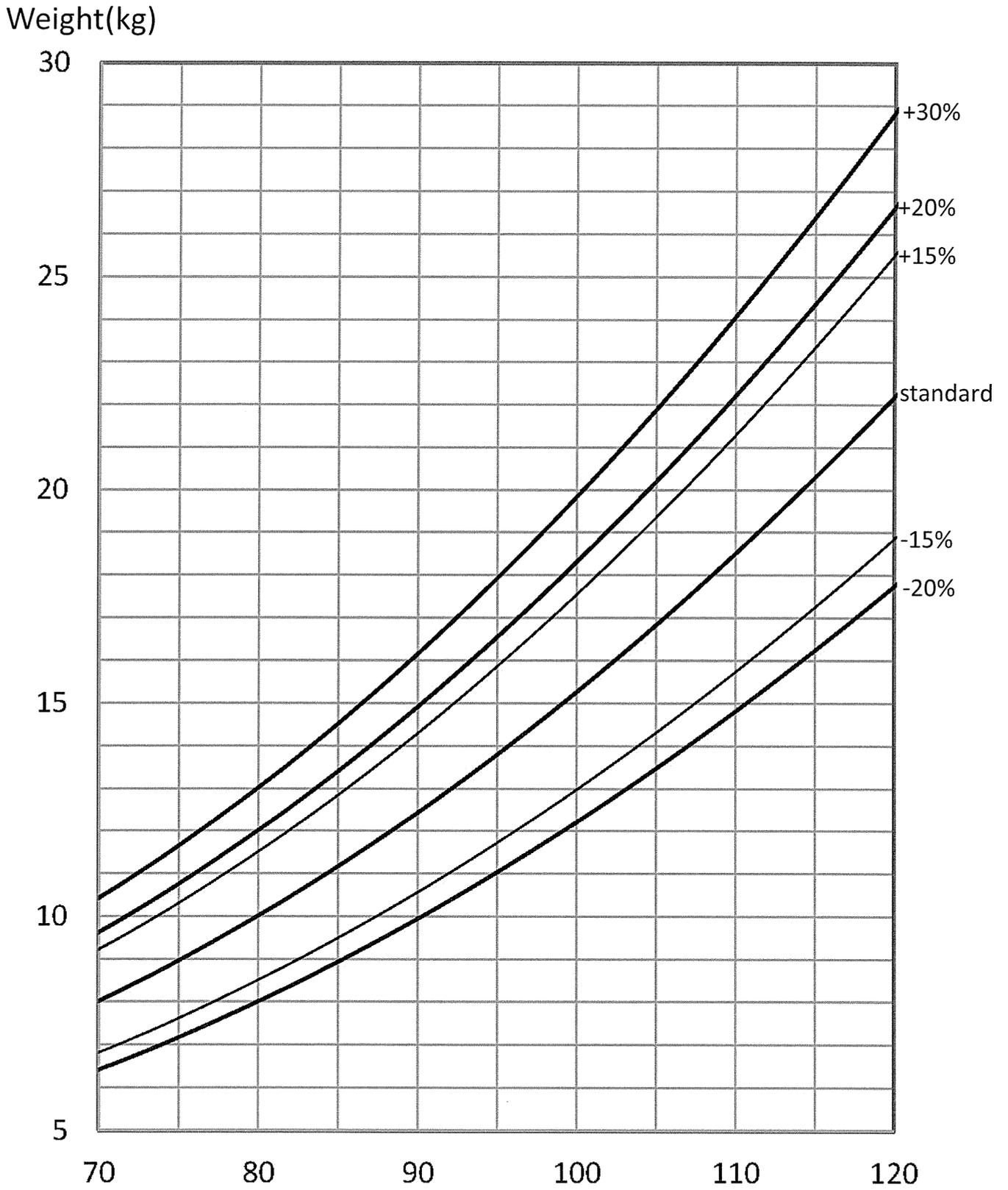


Figure 5-1 Weight for stature of male children



Fitted formula :  $Y=0.002226X^2 - 0.1471X + 7.8033$

Figure 5-2 Weight for stature of female children



Fitted formula :  $Y=0.002091X^2 - 0.1139X + 5.7453$  Stature(cm)

## Appendix A The numbers of samples among age groups

Data source for the survey consist of two kinds of data collection. The community based cross sectional data were gathered within a period of one month (September 2010). The longitudinal hospital data are with the quite short observation period which is around one month. Infants are recruited at 1 month health check-up both for mothers and babies. Measurement data were gathered retrospectively from the hospital admission records. The described age groups were used for LMS method where three parameters were calculated within each group.

For body weight, smoothing was done from the age group of five days through the age group of 6years or more. To reflect the neonatal physiological body loss which brings the lowest body weight values at the 2<sup>nd</sup> or 3<sup>rd</sup> days of life, the body weight references were created at every days of age until 4<sup>th</sup> days of life directly from the hospital records.

For length, chest circumference and head circumference, smoothing was done from the age group at birth, where sufficient amount of data were obtained during hospital stay of infants.

The cross sectional data and longitudinal data were combined for the smoothing of growth curves.

For smoothing, extreme data which were over or under 0.01% among distribution were excluded.

Table A-1 Number of samples for cross-sectional and longitudinal data

age group	male weight			female weight			male stature			female stature		
	total	cross-sectional	longitudinal	total	cross-sectional	longitudinal	total	cross-sectional	longitudinal	total	cross-sectional	longitudinal
birth	2414		2414	2284		2284	2384		2384	2274		2274
1day	2135		2135	2026		2026						
2days	2160		2160	2050		2050	13		13	10		10
3days	2187		2187	2084		2084	8		8	9		9
4days	2188		2188	2093		2093	92		92	135		135
5days	2084		2084	1944		1944	349		349	100		100
8-22days	14	4	10	23	6	17	14	4	10	23	6	17
23-27days	145	4	141	157	3	154	145	4	141	157	3	154
28-32days	1100	3	1097	1016	4	1012	1100	3	1097	1015	4	1011
33-37days	939	6	933	890	4	886	938	6	932	886	4	882
38-42days	199	9	190	185	8	177	199	9	190	184	7	177
43days- less than 2months	83	42	41	81	43	38	82	42	40	81	43	38
2months- less than 3 months	103	103		91	89	2	103	103		91	89	2
3months- less than 4 months	91	90	1	98	98		91	90	1	98	98	
4months- less than 5 months	117	117		112	112		118	118		112	112	
5months- less than 6 months	103	103		119	119		103	103		119	119	
6months- less than 7 months	116	116		120	120		116	116		120	120	
7months- less than 8 months	110	110		113	113		110	110		113	113	
8months- less than 9 months	103	103		99	99		103	103		99	99	
9months- less than 10 months	121	121		114	114		121	121		114	114	
10months- less than 11 months	101	101		92	92		102	102		92	92	
11months- less than 12 months	112	112		107	107		112	112		107	107	
12months- less than 13 months	111	111		111	111		113	113		111	111	
13months- less than 14 months	111	111		98	98		112	112		97	97	
14months- less than 15 months	94	94		85	85		95	95		86	86	
15months- less than 16 months	79	79		91	91		80	80		91	91	
16months- less than 17 months	104	104		106	106		105	105		106	106	
17months- less than 18 months	105	105		86	86		106	106		87	87	
18months- less than 19 months	104	104		105	105		105	105		106	106	
19months- less than 20 months	97	97		83	83		100	100		84	84	
20months- less than 21 months	92	92		88	88		94	94		89	89	
21months- less than 22 months	101	101		82	82		101	101		82	82	
22months- less than 23 months	107	107		92	92		107	107		93	93	
23months- less than 2years	105	105		96	96		106	106		96	96	
2years- less than 2years 6months	195	195		192	192		198	198		195	195	
2years 6months- less than 3years	163	163		166	166		163	163		164	164	
3years- less than 3years 6months	179	179		129	129		183	183		130	130	
3years 6months- less than 4years	157	157		158	158		160	160		159	159	
4years- less than 4years 6months	198	198		163	163		198	198		164	164	
4years 6months- less than 5years	147	147		150	150		147	147		149	149	
5years- less than 5years 6months	160	160		149	149		161	161		149	149	
5years 6months- less than 6years	156	156		148	148		156	156		148	148	
6years-	144	144		158	158		145	145		159	159	

Table A-2 Number of samples for cross-sectional and longitudinal data

age group	male chest circumference			female chest circumference			male head circumference			female head circumference		
	total	cross-sectional	longitudinal	total	cross-sectional	longitudinal	total	cross-sectional	longitudinal	total	cross-sectional	longitudinal
birth	2361		2361	2248		2248	2362		2362	2253		2253
1day	11		11	10		10	14		14	11		11
2days	1		1	4		4	4		4	6		6
3days	8		8	9		9	9		9	11		11
4days	91		91	134		134	97		97	137		137
5days	352		352	99		99	357		357	369		369
8-22days	14	4	10	23	6	17	14	4	10	23	6	17
23-27days	145	4	141	155	3	152	144	4	140	157	3	154
28-32days	1088	3	1085	1005	4	1001	1098	3	1095	1013	4	1009
33-37days	933	6	927	886	4	882	937	6	931	889	4	885
38-42days	197	9	188	183	8	175	198	9	189	185	8	177
43days- less than 2months	81	41	40	81	43	38	80	41	39	81	43	38
2months- less than 3 months	103	103		91	89	2	103	103		91	89	2
3months- less than 4 months	91	90	1	98	98		91	90	1	98	98	
4months- less than 5 months	118	118		112	112		118	118		112	112	
5months- less than 6 months	103	103		119	119		103	103		119	119	
6months- less than 7 months	116	116		120	120		116	116		120	120	
7months- less than 8 months	110	110		113	113		110	110		113	113	
8months- less than 9 months	103	103		99	99		103	103		99	99	
9months- less than 10 months	121	121		114	114		121	121		114	114	
10months- less than 11 months	102	102		92	92		102	102		92	92	
11months- less than 12 months	112	112		107	107		112	112		107	107	
12months- less than 13 months	112	112		111	111		112	112		111	111	
13months- less than 14 months	112	112		97	97		112	112		97	97	
14months- less than 15 months	95	95		85	85		95	95		85	85	
15months- less than 16 months	80	80		91	91		80	80		91	91	
16months- less than 17 months	105	105		106	106		105	105		106	106	
17months- less than 18 months	106	106		87	87		107	107		87	87	
18months- less than 19 months	105	105		105	105		105	105		105	105	
19months- less than 20 months	101	101		84	84		101	101		84	84	
20months- less than 21 months	93	93		89	89		93	93		89	89	
21months- less than 22 months	102	102		82	82		102	102		82	82	
22months- less than 23 months	109	109		93	93		109	109		93	93	
23months- less than 2years	105	105		96	96		106	106		96	96	
2years- less than 2years 6months	198	198		196	196		198	198		196	196	
2years 6months- less than 3years	165	165		165	165		167	167		166	166	
3years- less than 3years 6months	183	183		130	130		182	182		130	130	
3years 6months- less than 4years	158	158		159	159		158	158		159	159	
4years- less than 4years 6months	197	197		164	164		197	197		164	164	
4years 6months- less than 5years	147	147		150	150		147	147		150	150	
5years- less than 5years 6months	160	160		149	149		160	160		149	149	
5years 6months- less than 6years	155	155		147	147		155	155		147	147	
6years-	144	144		159	159		145	145		159	159	

Table A-3 Number of samples used for smoothing

age group	male weight			female weight			male stature			female satrure		
	total	smoothed	excluded	total	smoothed	excluded	total	smoothed	excluded	total	smoothed	excluded
birth	2414	0	2414	2284	0	2284	2384	2372	12	2274	2264	10
1day	2135	0	2135	2026	0	2026						
2days	2160	0	2160	2050	0	2050	13	0	13	10	0	10
3days	2187	0	2187	2084	0	2084	8	0	8	9	0	9
4days	2188	0	2188	2093	0	2093	92	0	92	135	0	135
5days	2084	2078	6	1944	1936	8	349	0	349	363	0	363
8-22days	14	14	0	23	23	0	277	0	277	237	0	237
23-27days	145	145	0	157	157	0	107	0	107	100	0	100
28-32days	1100	1090	10	1016	1007	9	1100	1090	10	1015	1008	7
33-37days	939	937	2	890	888	2	938	932	6	886	882	4
38-42days	199	199	0	185	184	1	199	198	1	184	184	0
43days- less than 2months	83	83	0	81	81	0	82	82	0	81	81	0
2months- less than 3 months	103	103	0	91	91	0	103	103	0	91	90	1
3months- less than 4 months	91	91	0	98	98	0	91	91	0	98	98	0
4months- less than 5 months	117	116	1	112	112	0	118	117	1	112	112	0
5months- less than 6 months	103	102	1	119	119	0	103	102	1	119	119	0
6months- less than 7 months	116	116	0	120	119	1	116	115	1	120	119	1
7months- less than 8 months	110	110	0	113	112	1	110	109	1	113	112	1
8months- less than 9 months	103	103	0	99	97	2	103	103	0	99	98	1
9months- less than 10 months	121	121	0	114	113	1	121	121	0	114	114	0
10months- less than 11 months	101	101	0	92	92	0	102	101	1	92	92	0
11months- less than 12 months	112	112	0	107	106	1	112	112	0	107	106	1
12months- less than 13 months	111	111	0	111	111	0	113	113	0	111	111	0
13months- less than 14 months	111	110	1	98	98	0	112	111	1	97	97	0
14months- less than 15 months	94	94	0	85	85	0	95	95	0	86	86	0
15months- less than 16 months	79	78	1	91	91	0	80	80	0	91	91	0
16months- less than 17 months	104	104	0	106	105	1	105	105	0	106	106	0
17months- less than 18 months	105	105	0	86	86	0	106	106	0	87	87	0
18months- less than 19 months	104	104	0	105	105	0	105	105	0	106	106	0
19months- less than 20 months	97	97	0	83	83	0	100	99	1	84	83	1
20months- less than 21 months	92	92	0	88	88	0	94	93	1	89	89	0
21months- less than 22 months	101	101	0	82	82	0	101	101	0	82	82	0
22months- less than 23 months	107	106	1	92	92	0	107	107	0	93	93	0
23months- less than 2years	105	105	0	96	96	0	106	106	0	96	96	0
2years- less than 2years 6months	195	195	0	192	190	2	198	197	1	195	194	1
2years 6months- less than 3years	163	163	0	166	166	0	163	163	0	164	163	1
3years- less than 3years 6months	179	179	0	129	129	0	183	182	1	130	130	0
3years 6months- less than 4years	157	155	2	158	158	0	160	158	2	159	158	1
4years- less than 4years 6months	198	198	0	163	163	0	198	198	0	164	164	0
4years 6months- less than 5years	147	147	0	150	149	1	147	147	0	149	149	0
5years- less than 5years 6months	160	159	1	149	149	0	161	160	1	149	148	1
5years 6months- less than 6years	156	155	1	148	148	0	156	156	0	148	147	1
6years-	144	144	0	158	157	1	145	145	0	159	159	0

Table A-4 Number of samples used for smoothing

age group	male chest circumference			female chest circumference			male head circumference			female head circumference		
	total	smoothed	excluded	total	smoothed	excluded	total	smoothed	excluded	total	smoothed	excluded
birth	2361	2348	13	2248	2239	9	2362	2345	17	2253	2238	15
1day	11	0	11	10	0	10	14	0	14	11	0	11
2days	1	0	1	4	0	4	4	0	4	6	0	6
3days	8	0	8	9	0	9	9	0	9	11	0	11
4days	91	0	91	134	0	134	97	0	97	137	0	137
5days	352	0	352	365	0	365	357	0	357	369	0	369
8-22days	14	14	0	23	23	0	14	14	0	23	23	0
23-27days	145	145	0	155	155	0	144	144	0	157	156	1
28-32days	1088	1073	15	1005	995	10	1098	1089	9	1013	1003	10
33-37days	933	931	2	886	882	4	937	933	4	889	884	5
38-42days	197	197	0	183	181	2	198	198	0	185	185	0
43days- less than 2months	81	81	0	81	81	0	80	80	0	81	80	1
2months- less than 3 months	103	103	0	91	91	0	103	103	0	91	90	1
3months- less than 4 months	91	91	0	98	98	0	91	91	0	98	98	0
4months- less than 5 months	118	116	2	112	112	0	118	118	0	112	112	0
5months- less than 6 months	103	103	0	119	119	0	103	102	1	119	119	0
6months- less than 7 months	116	116	0	120	119	1	116	116	0	120	119	1
7months- less than 8 months	110	110	0	113	113	0	110	110	0	113	113	0
8months- less than 9 months	103	103	0	99	97	2	103	102	1	99	99	0
9months- less than 10 months	121	120	1	114	114	0	121	120	1	114	114	0
10months- less than 11 months	102	102	0	92	92	0	102	100	2	92	92	0
11months- less than 12 months	112	112	0	107	106	1	112	112	0	107	107	0
12months- less than 13 months	112	112	0	111	111	0	112	112	0	111	111	0
13months- less than 14 months	112	110	2	97	97	0	112	111	1	97	97	0
14months- less than 15 months	95	94	1	85	84	1	95	95	0	85	85	0
15months- less than 16 months	80	80	0	91	91	0	80	79	1	91	91	0
16months- less than 17 months	105	105	0	106	106	0	105	105	0	106	105	1
17months- less than 18 months	106	106	0	87	86	1	107	106	1	87	87	0
18months- less than 19 months	105	104	1	105	105	0	105	102	3	105	105	0
19months- less than 20 months	101	101	0	84	84	0	101	101	0	84	84	0
20months- less than 21 months	93	93	0	89	89	0	93	92	1	89	89	0
21months- less than 22 months	102	102	0	82	82	0	102	101	1	82	81	1
22months- less than 23 months	109	108	1	93	93	0	109	106	3	93	93	0
23months- less than 2years	105	105	0	96	96	0	106	106	0	96	96	0
2years- less than 2years 6months	198	198	0	196	195	1	198	198	0	196	195	1
2years 6months- less than 3years	165	164	1	165	164	1	167	167	0	166	165	1
3years- less than 3years 6months	183	183	0	130	130	0	182	182	0	130	130	0
3years 6months- less than 4years	158	157	1	159	159	0	158	156	2	159	159	0
4years- less than 4years 6months	197	197	0	164	163	1	197	196	1	164	163	1
4years 6months- less than 5years	147	147	0	150	149	1	147	147	0	150	149	1
5years- less than 5years 6months	160	159	1	149	149	0	160	158	2	149	149	0
5years 6months- less than 6years	155	154	1	147	147	0	155	155	0	147	145	2
6years-	144	143	1	159	159	0	145	145	0	159	159	0

## Appendix B The ranges of data used for the smoothing

For smoothing, extreme data which were over or under 0.01% among distribution were excluded. The upper and lower limits were shown in the tables.

Table B-1 The ranges of data used for smoothing

age group	male weight(g)		female weight(g)	
	lower	upper	lower	upper
5days	1129	4481	1376	4410
8-22days	1526	5539	1739	5384
23-27days	1703	5968	1867	5709
28-32days	1821	6242	1960	5942
33-37days	1940	6509	2057	6178
38-42days	2076	6804	2161	6425
43days- less than 2months	2332	7333	2359	6882
2months- less than 3 months	2963	8503	2908	8045
3months- less than 4 months	3611	9537	3370	8917
4months- less than 5 months	4169	10314	3790	9627
5months- less than 6 months	4612	10869	4161	10198
6months- less than 7 months	4993	11325	4446	10613
7months- less than 8 months	5280	11669	4704	10977
8months- less than 9 months	5518	11964	4910	11267
9months- less than 10 months	5728	12240	5086	11520
10months- less than 11 months	5915	12504	5251	11764
11months- less than 12 months	6076	12750	5404	11999
12months- less than 13 months	6234	13004	5550	12233
13months- less than 14 months	6404	13289	5709	12498
14months- less than 15 months	6554	13547	5872	12778
15months- less than 16 months	6725	13855	6028	13056
16months- less than 17 months	6895	14168	6186	13346
17months- less than 18 months	7062	14488	6357	13672
18months- less than 19 months	7222	14803	6519	13990
19months- less than 20 months	7385	15136	6682	14323
20months- less than 21 months	7545	15471	6858	14696
21months- less than 22 months	7703	15811	7005	15016
22months- less than 23 months	7864	16171	7171	15392
23months- less than 2years	8013	16515	7336	15778
2years- less than 2years 6months	8539	17833	7813	16972
2years 6months- less than 3years	9319	20181	8681	19468
3years- less than 3years 6months	10000	22805	9328	21633
3years 6months- less than 4years	10594	25698	9913	23833
4years- less than 4years 6months	11074	28456	10452	26055
4years 6months- less than 5years	11556	31264	11017	28490
5years- less than 5years 6months	11990	33200	11633	31225
5years 6months- less than 6years	12428	34286	12506	35752
6years-	12856	34776	13552	44957

age group	male stature(cm)		female stature(cm)	
	lower	upper	lower	upper
birth	37.17	55.96	40.17	56.66
8-22days	40.26	59.26	41.89	58.41
23-27days	41.56	60.43	42.48	59.23
28-32days	42.40	61.19	42.90	59.83
33-37days	43.21	61.93	43.34	60.43
38-42days	44.11	62.77	43.80	61.08
43days- less than 2months	45.74	64.29	44.67	62.29
2months- less than 3 months	49.39	67.76	47.00	65.52
3months- less than 4 months	52.82	71.05	48.93	68.14
4months- less than 5 months	55.59	73.75	50.73	70.47
5months- less than 6 months	57.74	75.89	52.45	72.54
6months- less than 7 months	59.62	77.82	53.93	74.19
7months- less than 8 months	61.07	79.41	55.45	75.78
8months- less than 9 months	62.33	80.86	56.85	77.14
9months- less than 10 months	63.50	82.26	58.18	78.41
10months- less than 11 months	64.58	83.60	59.54	79.67
11months- less than 12 months	65.52	84.81	60.86	80.89
12months- less than 13 months	66.41	85.97	62.11	82.07
13months- less than 14 months	67.32	87.15	63.43	83.35
14months- less than 15 months	68.09	88.14	64.71	84.65
15months- less than 16 months	68.92	89.22	65.90	85.90
16months- less than 17 months	69.71	90.24	67.05	87.17
17months- less than 18 months	70.45	91.22	68.25	88.56
18months- less than 19 months	71.14	92.13	69.35	89.90
19months- less than 20 months	71.81	93.05	70.41	91.25
20months- less than 21 months	72.45	93.93	71.53	92.77
21months- less than 22 months	73.07	94.80	72.42	94.04
22months- less than 23 months	73.68	95.69	73.41	95.51
23months- less than 2years	74.25	96.52	74.36	97.00
2years- less than 2years 6months	76.26	99.58	76.97	101.36
2years 6months- less than 3years	79.40	104.51	81.18	108.71
3years- less than 3years 6months	82.53	109.45	83.88	112.81
3years 6months- less than 4years	85.62	114.31	85.82	115.53
4years- less than 4years 6months	88.39	118.71	86.95	117.90
4years 6months- less than 5years	91.34	123.32	87.28	120.51
5years- less than 5years 6months	93.88	127.01	87.44	123.27
5years 6months- less than 6years	96.02	129.77	89.61	126.75
6years-	97.37	131.71	94.90	130.62

1.319cm added when 2years and more  
 1.366cm added when 2years and more

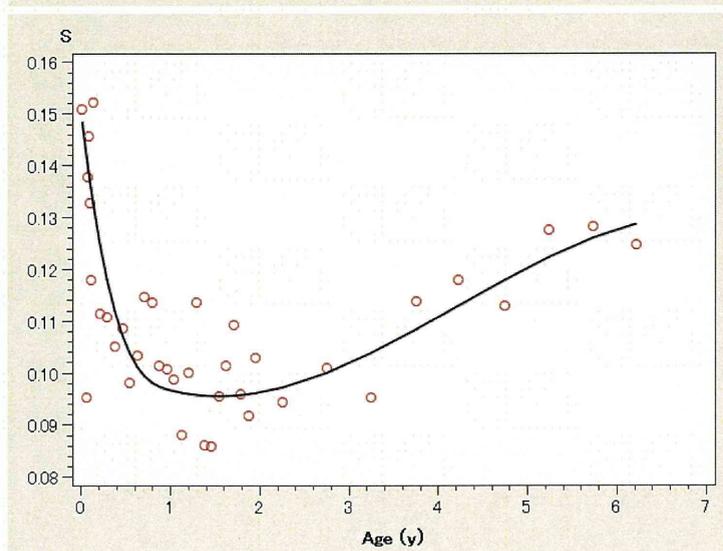
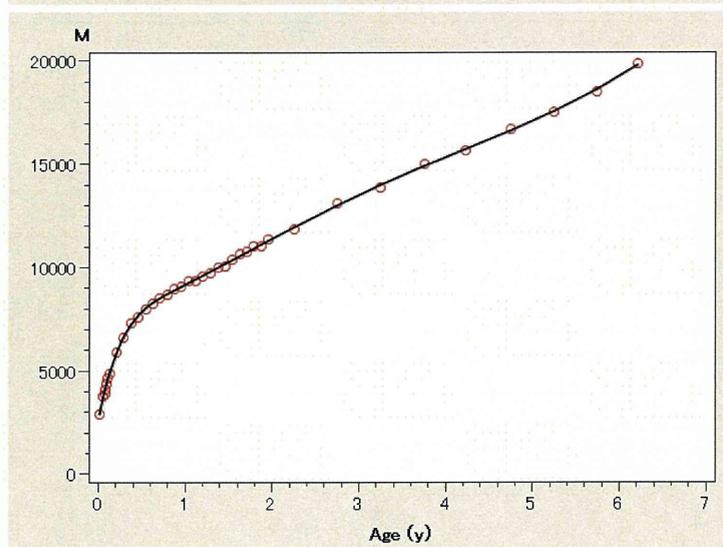
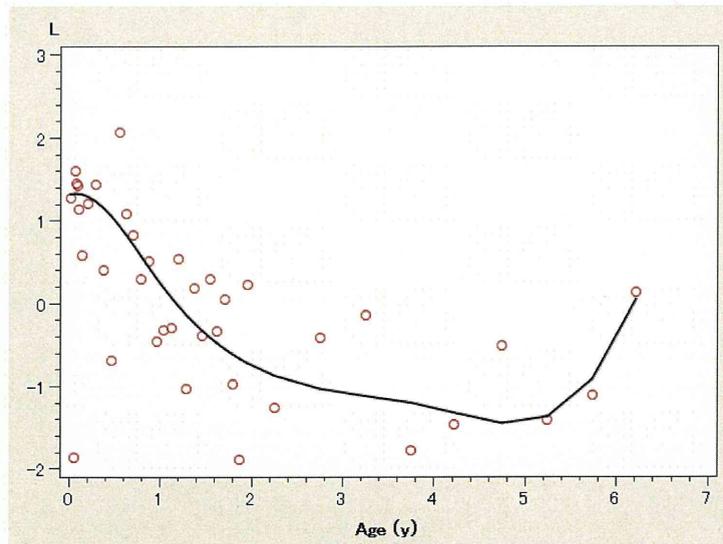
Table B-2 The ranges of data used for smoothing

age group	male chest circ(cm)		female chest circ(cm)		male head circ(cm)		female head circ(cm)	
	lower	upper	lower	upper	lower	upper	lower	upper
birth	23.53	38.31	24.80	38.57	27.70	38.64	28.20	39.09
8-22days	25.87	41.07	26.57	41.01	29.20	40.24	29.49	40.45
23-27days	26.81	42.17	27.17	41.81	29.82	40.89	29.93	40.90
28-32days	27.41	42.87	27.59	42.38	30.22	41.31	30.24	41.23
33-37days	27.99	43.54	28.02	42.95	30.61	41.71	30.56	41.55
38-42days	28.63	44.28	28.48	43.55	31.04	42.15	30.90	41.89
43days- less than 2months	29.78	45.59	29.31	44.64	31.83	42.94	31.52	42.51
2months- less than 3 months	32.25	48.34	31.41	47.28	33.58	44.65	33.13	44.04
3months- less than 4 months	34.31	50.53	32.93	49.05	35.17	46.13	34.35	45.12
4months- less than 5 months	35.72	51.92	34.10	50.28	36.38	47.20	35.35	45.96
5months- less than 6 months	36.61	52.73	34.98	51.09	37.26	47.97	36.16	46.61
6months- less than 7 months	37.31	53.35	35.61	51.60	38.02	48.65	36.77	47.12
7months- less than 8 months	37.84	53.86	36.19	52.04	38.62	49.24	37.33	47.62
8months- less than 9 months	38.30	54.32	36.67	52.37	39.15	49.80	37.79	48.07
9months- less than 10 months	38.72	54.76	37.08	52.64	39.64	50.36	38.18	48.48
10months- less than 11 months	39.10	55.17	37.46	52.88	40.09	50.91	38.54	48.89
11months- less than 12 months	39.43	55.51	37.81	53.09	40.48	51.40	38.86	49.26
12months- less than 13 months	39.73	55.82	38.12	53.28	40.84	51.87	39.14	49.59
13months- less than 14 months	40.03	56.10	38.44	53.50	41.19	52.33	39.42	49.90
14months- less than 15 months	40.27	56.32	38.74	53.71	41.47	52.70	39.67	50.19
15months- less than 16 months	40.54	56.53	39.02	53.92	41.76	53.08	39.90	50.44
16months- less than 17 months	40.78	56.72	39.28	54.13	42.02	53.43	40.11	50.66
17months- less than 18 months	41.00	56.88	39.55	54.36	42.25	53.74	40.31	50.88
18months- less than 19 months	41.21	57.03	39.79	54.59	42.46	54.02	40.50	51.07
19months- less than 20 months	41.41	57.17	40.02	54.81	42.65	54.28	40.66	51.24
20months- less than 21 months	41.60	57.31	40.25	55.06	42.81	54.50	40.84	51.42
21months- less than 22 months	41.79	57.45	40.44	55.28	42.97	54.71	40.98	51.56
22months- less than 23 months	41.98	57.60	40.65	55.52	43.11	54.89	41.12	51.72
23months- less than 2years	42.15	57.75	40.84	55.78	43.24	55.05	41.27	51.87
2years- less than 2years 6months	42.81	58.44	41.35	56.57	43.62	55.45	41.67	52.31
2years 6months- less than 3years	43.89	60.00	42.10	58.28	44.04	55.69	42.39	53.16
3years- less than 3years 6months	44.89	62.22	42.55	59.92	44.24	55.64	42.94	53.85
3years 6months- less than 4years	45.75	65.33	42.97	61.84	44.25	55.55	43.47	54.51
4years- less than 4years 6months	46.39	69.16	43.51	64.15	44.18	55.54	44.00	55.14
4years 6months- less than 5years	46.81	73.45	44.30	67.06	44.20	55.66	44.57	55.75
5years- less than 5years 6months	46.67	74.42	45.26	70.49	44.54	55.98	45.14	56.29
5years 6months- less than 6years	45.28	72.24	46.49	76.19	45.28	56.63	45.79	56.90
6years-	39.08	69.64	47.72	90.24	46.24	57.93	46.42	57.51

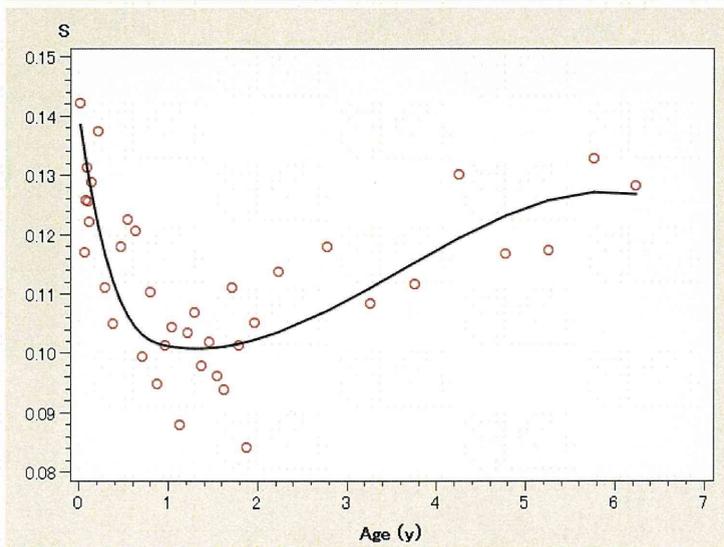
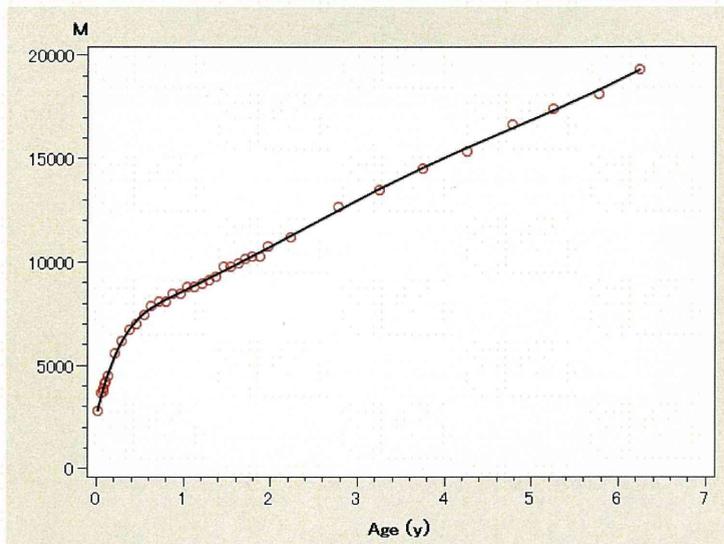
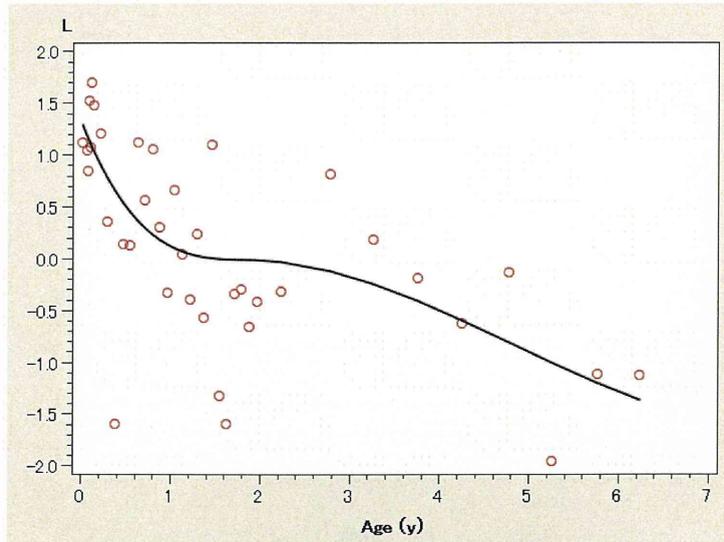
# Appendix C

Smoothed L, M and S for each item

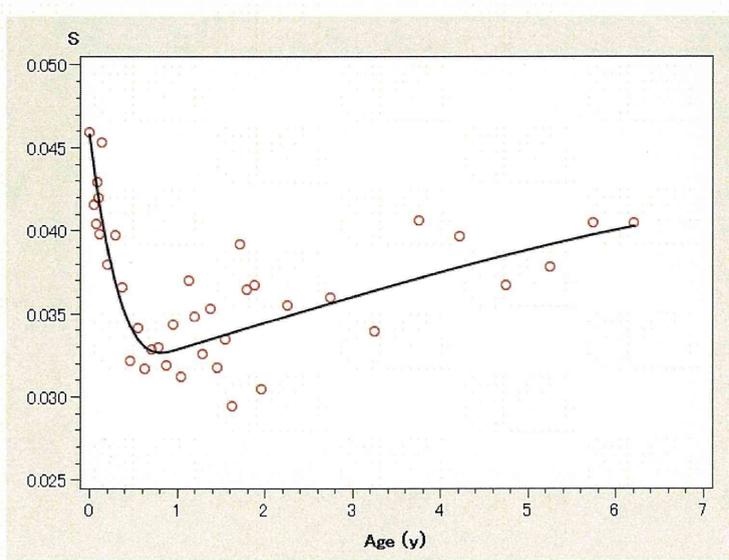
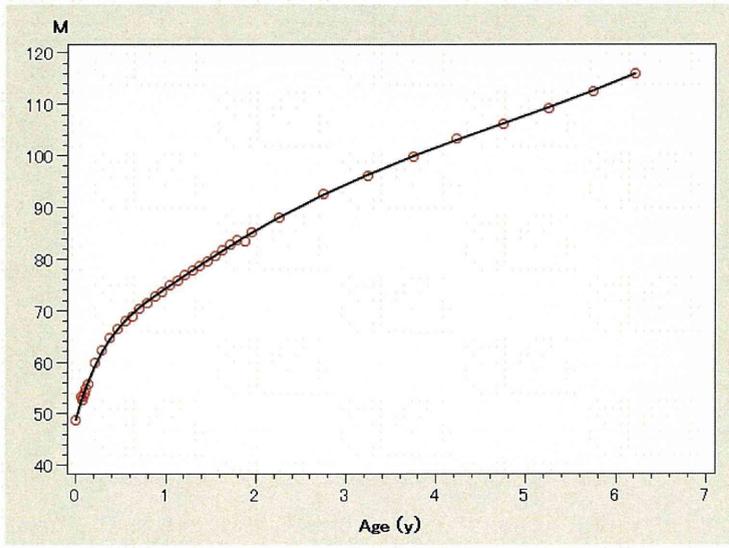
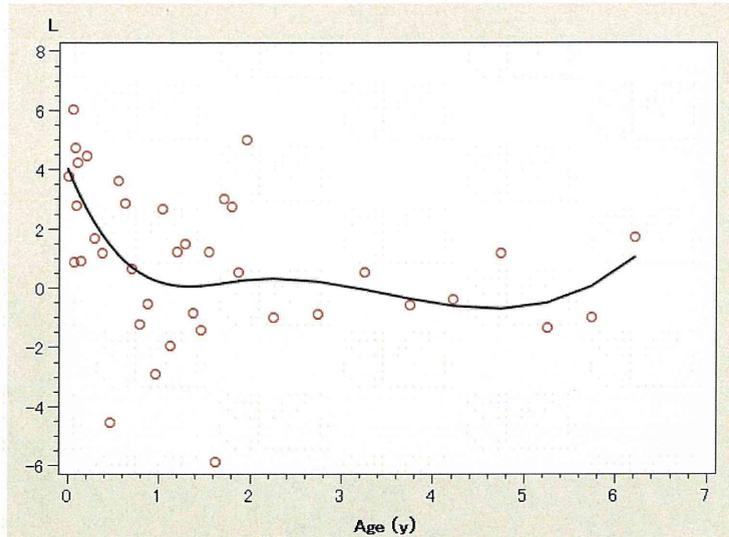
a. male weight



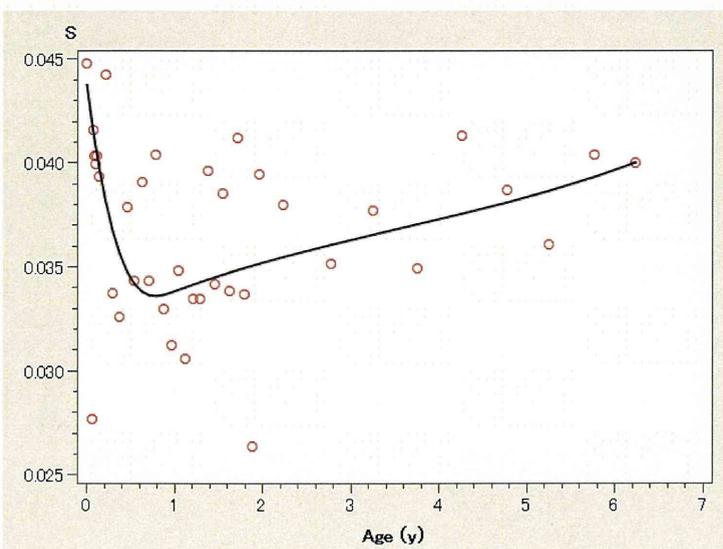
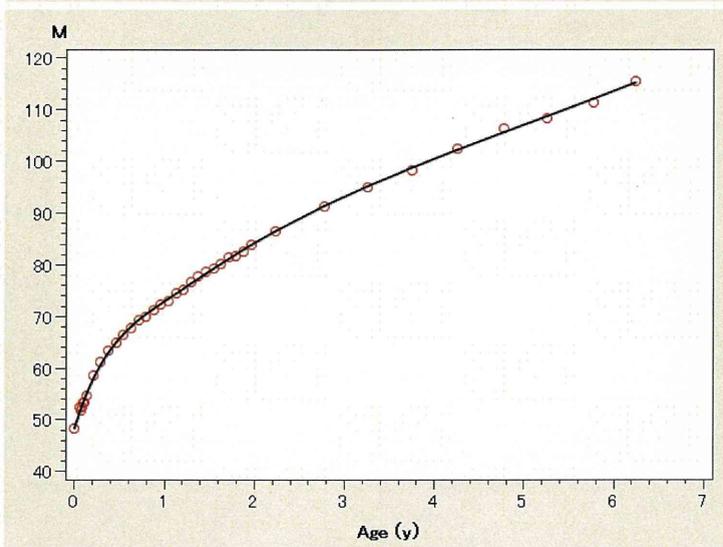
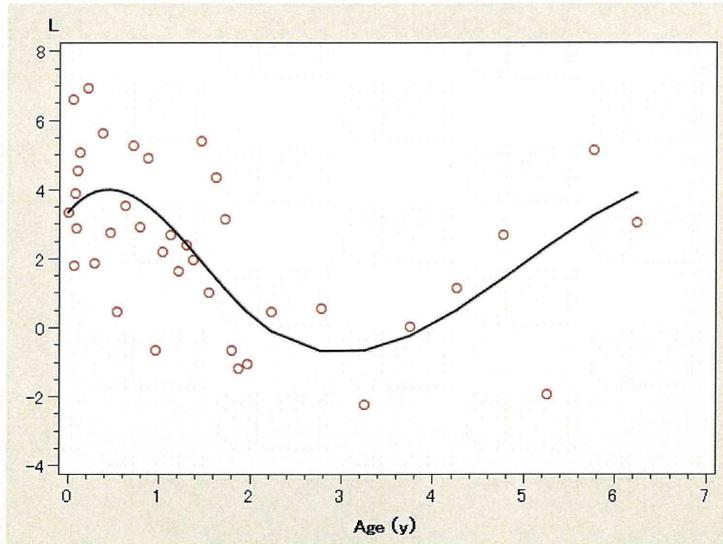
b. Female weight



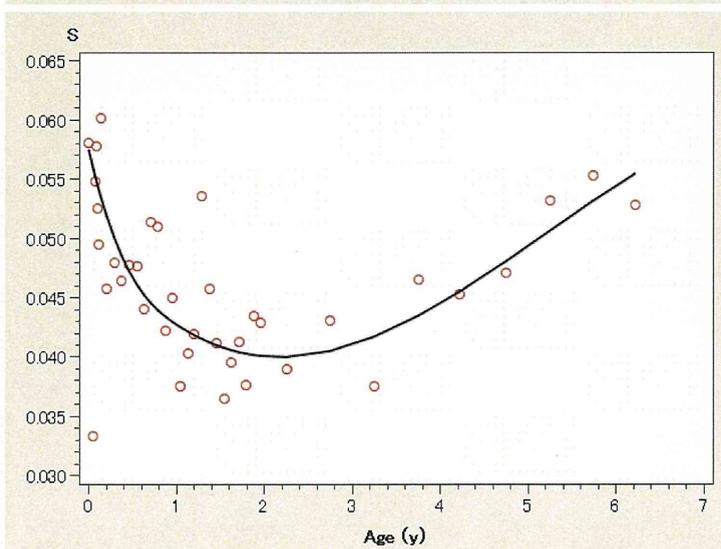
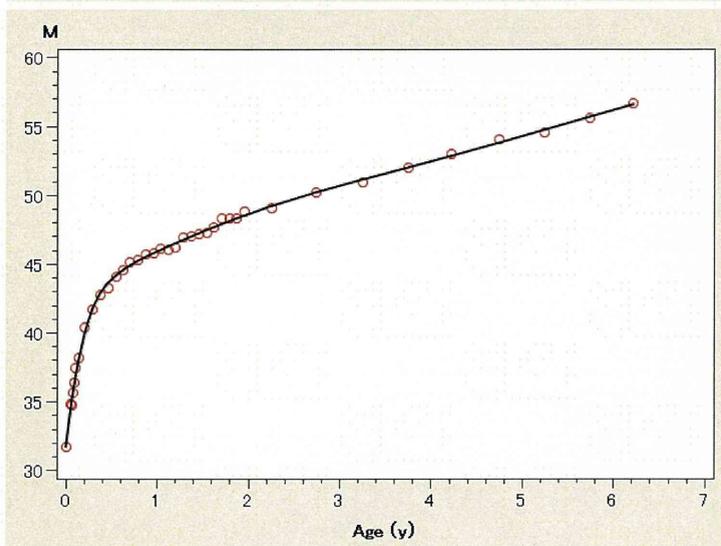
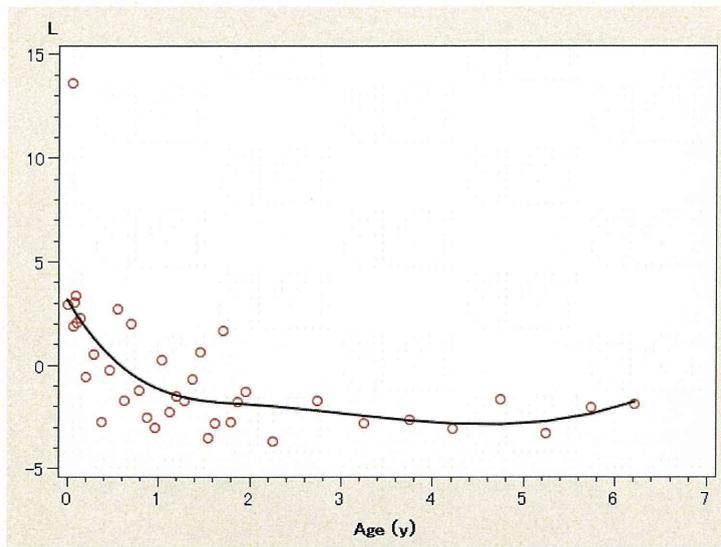
c. male stature (1.319cm added when more than 2 years of age)



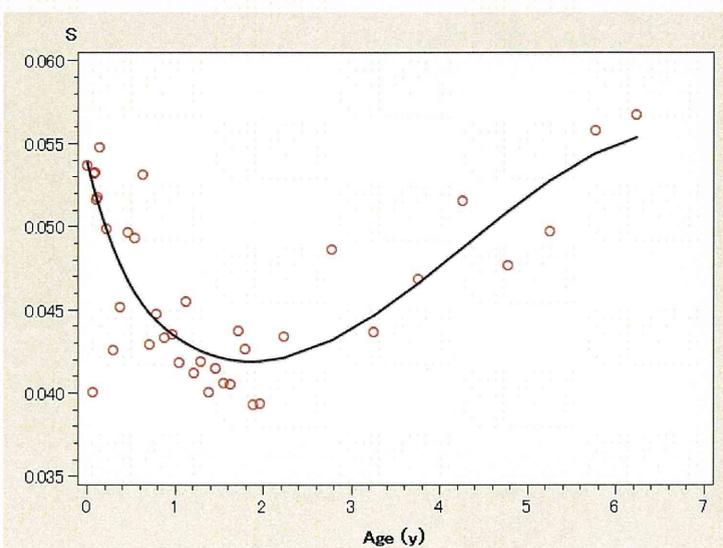
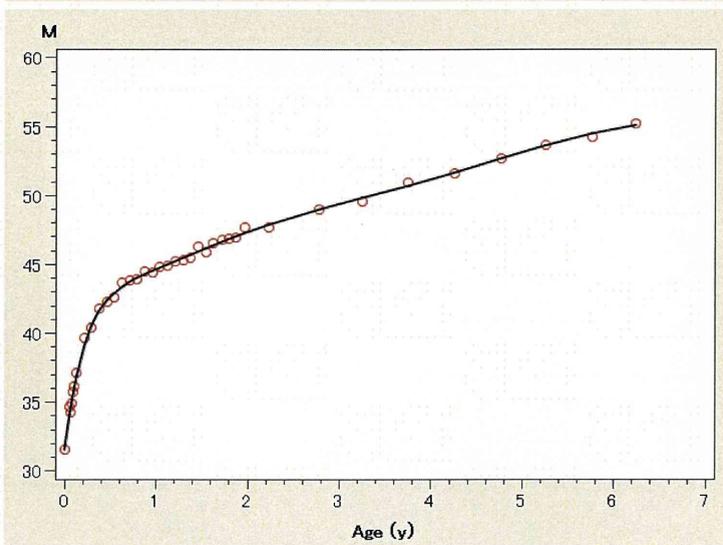
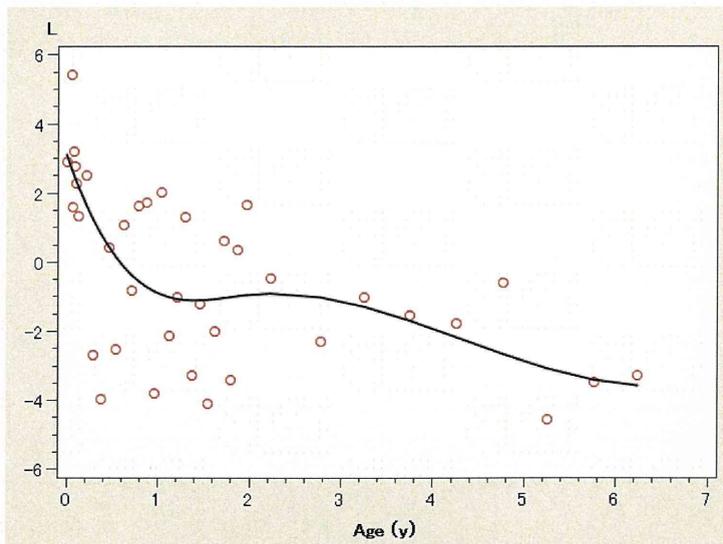
d. female stature (1.366cm added when more than 2 years of age)



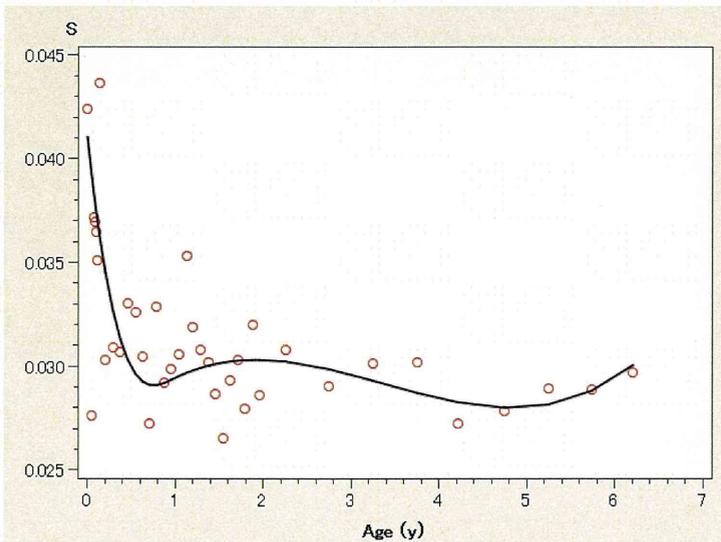
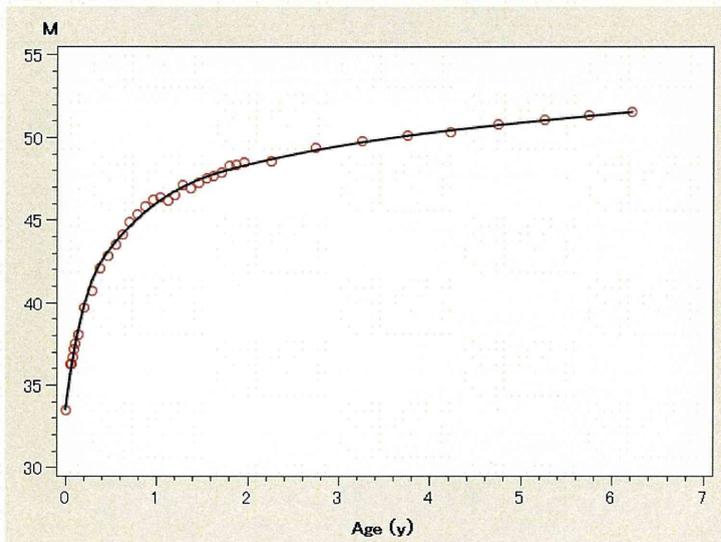
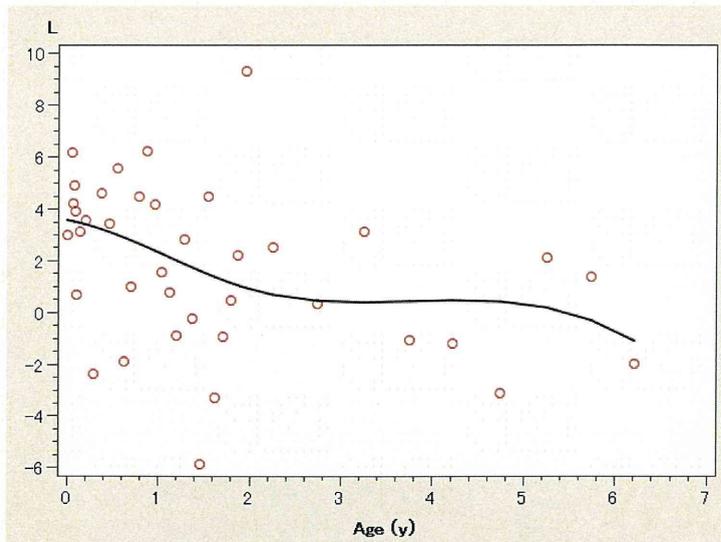
e. male chest circumference



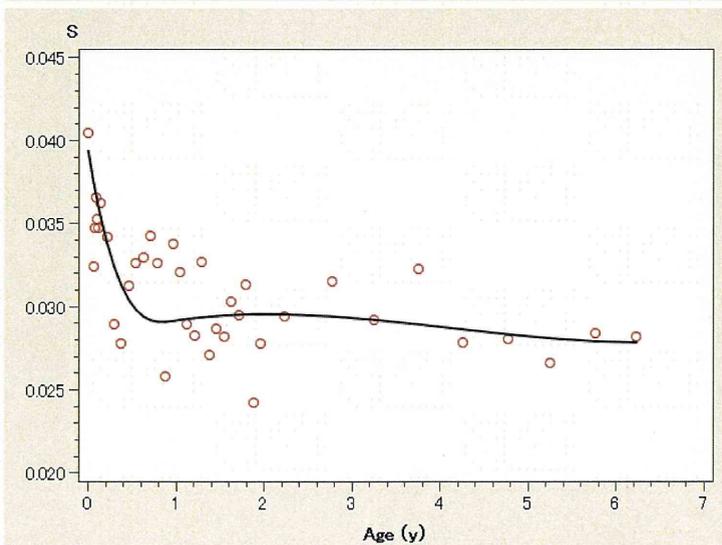
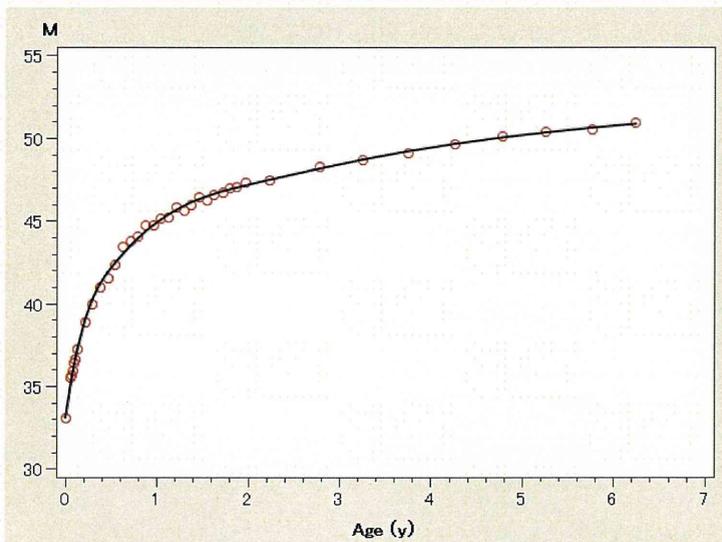
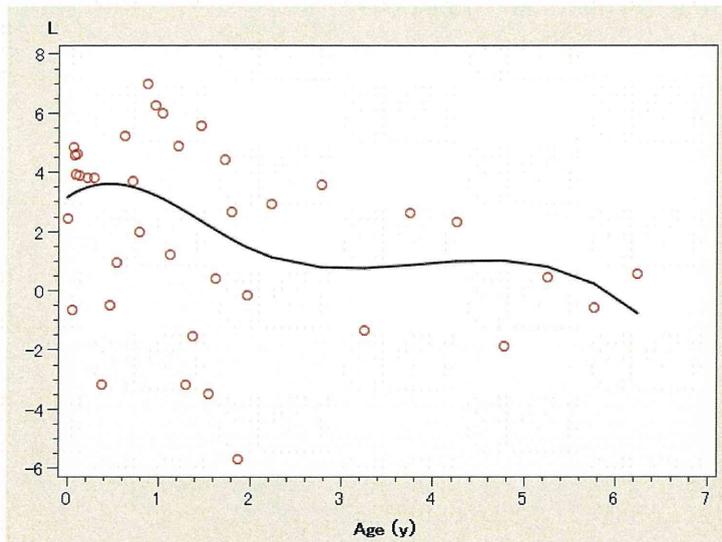
f. female chest circumference



g. male head circumference



h. female head circumference



Appendix D. Smoothed formulae for L,M and S  
Results of smoothing by cubic spline function

a. male weight (g, x: age of years)

L

5 days – 1 year

$$0.991050734x^3 - 2.3951634x^2 + 0.331977x + 1.31741$$

1 year – 4 years

$$-0.08335596x^3 + 0.82805665x^2 - 2.89124x + 2.391817$$

4 years -

$$0.253585268x^3 - 3.2152381x^2 + 13.28194x - 19.1724$$

M

5 days – 0.5 years

$$15570.72592x^3 - 28355.313x^2 + 20734.37x + 2612.627$$

0.5years – 0.9 years

$$4301.572917x^3 - 11451.583x^2 + 12282.5x + 4021.271$$

0.9 years – 2.1 years

$$-70.0644185x^3 + 351.837657x^2 + 1659.422x + 7208.195$$

2.1 years – 3.5 years

$$-22.3137367x^3 + 51.0083614x^2 + 2291.164x + 6765.976$$

3.5 years -

$$87.18864401x^3 - 1098.7666x^2 + 6315.376x + 2071.061$$

S

5 days – 1 year

$$-0.04498833x^3 + 0.13931728x^2 - 0.14798x + 0.150307$$

1 year -

$$-0.08997665x^3 + 0.27863456x^2 - 0.29595x + 0.300613$$

b. female weight(g, x: age of years)

L

5 days – 2 years

$$-0.22155082x^3 + 1.19869901x^2 - 2.17802x + 1.317518$$

2 years -

$$0.015418376x^3 - 0.2231162x^2 + 0.665613x - 0.57824$$

M

5 days – 0.5 years

$$11794.92532x^3 - 22756.72x^2 + 17934.9x + 2562.949$$

0.5years – 0.9 years

$$4295.998048x^3 - 11508.329x^2 + 12310.7x + 3500.315$$

0.9 years – 2.1 years

$$-3.58665342x^3 + 100.549844x^2 + 1862.714x + 6634.712$$

2.1 years – 3.5 years

$$-67.7627649x^3 + 504.859347x^2 + 1013.664x + 7229.047$$

3.5 years -

$$55.75487068x^3 - 792.07583x^2 + 5552.937x + 1933.228$$

S

5 days – 1 year

$$-0.03200352x^3 + 0.10028505x^2 - 0.10709x + 0.140026$$

1 year -

$$-0.06400704x^3 + 0.20057009x^2 - 0.21418x + 0.280052$$