

3. AGE-RELATED MEAN VALUES AND PERCENTILES OF SELECTED BODY MEASUREMENTS (KÁLMÁN JOUBERT, SAROLTA DARVAY, ANNAMÁRIA ZSÁKAI, RÓZSA ÁGFALVI)

One important objective of the Hungarian Longitudinal Growth Study was to develop and publish age-related national reference values for the most important body measurements.

As stated in the section on sampling, the data recorded up to the age of 14 are national reference values without any corrections. Due to regional differences in drop out ratios, data on subjects between the age of 14.5 and 18 years need to be corrected with weights in order to become national reference values.

The results in the tables and figures published in this volume are calculated from data weighted according to the requirements, so *means and percentiles published from birth to the age of 18 years are national reference values*.

Here we have to note that as written in the titles of tables and figures: the published study results refer to the so-called “reference data population”. In accordance with the request of the Paediatric Professional Board, only those children who were born with a body weight between 2500 and 4500g, and who were neither suffering from any diseases influencing growth and development, nor from other lasting diseases, were included in the “reference population”. As such, 2984 boys and 2701 girls were included in the so-called reference data population at birth. By the age of 18, we could take measurements of 516 boys and 523 girls of those originally enrolled.

Ever since the first results were published, Hungarian paediatricians and health visitors have been using these reference values (means, percentiles), which were based on the body measurements recorded during the longitudinal child growth survey, and performed on a nationally representative sample (*Joubert-Ágfalvi 1988a, 1988b, Joubert-Darvay-Ágfalvi 1993a, 1993b, 1996a, 1996b; Darvay-Ágfalvi-Joubert 1997; Joubert-Darvay-Ágfalvi 2003; 2005*).

In the following section, we present the reference-means \bar{x} , standard deviations (SD), and reference percentiles (3rd, 10th, 25th, 50th, 75th, 90th and 97th percentiles) of selected body measurements and calculated values from the anthropometric sizes, which were recorded during the survey from birth to the age of 18 years for boys and girls: body height (body length), body weight, body mass index (BMI), body weight for body height, head circumference, chest circumference, abdominal circumference, and skinfolds measured in the triceps, subscapular, suprailiacal, and abdominal region.

Before presenting the anthropometric measurements listed above in tables and figures, we provide a precise description of the given sizes.

Body length and body height

From birth to the age of two years, children’s *body length* is measured on an infant-length measuring board in a supine position.

From the age of three onwards, *body height* is measured in standing position with an anthropometer. The head of the child standing barefoot is in a straight position – but not too tense – and set to the Frankfurt horizontal plane. The feet are kept in an open position in front, and in a not entirely closed position at the back.

The reference values for children’s body height (body length) are found in *Tables 3.1* and *3.2*. Reference percentiles curves for ages 0 to 36 months are shown in *Figures 3.1* and *3.2*, while reference percentiles for the body height values for ages two to 18 are shown in *Figures 3.3* and *3.4*.

Body weight

A child's body weight (body mass) is measured with ten-gram precision in infancy, always at the same time of the day, preferably in the morning, while the child is naked or wearing just a pair of short trousers.

Children's body weight reference values are found in *Tables 3.3* and *3.4*. Reference percentiles for 0 to 36 months of age are shown in *Figures 3.5* and *3.6*, while reference curves for two to 18 years of age are found in *Figures 3.7* and *3.8*.

The surveyed child's body height (body length) and body weight values are marked in the percentile graph from time to time, or these values are compared to values in the tables, so the actual growth and development data of the child can easily be examined and evaluated.

Weight-for-height

Reference values of weight-for-height (length) provide age-independent figures to evaluate the status of the infant and child in terms of nutritional and physical development. Weight-for-height is a frequently applied indicator despite the distortive effect of age independence.

Reference means and reference percentiles of body weight related body height (body length) are presented in *Tables 3.5* and *3.6*. Corresponding reference percentile curves for 0 to 2 years of age are shown in *Figures 3.9* and *3.10*, and for two to ten years of age in *Figures 3.11* and *3.12*. They provide information on mean body weight and body weight percentiles per body height (body length) in centimetres. The figures were modeled by fitting a fifth degree polynomial based on data referring to the period from birth to the age of 14. Values are presented from birth to the age of 18.

Comparison of the two biological parameters should aid evaluation of the status of physical development of the child, even if evaluation of reference values obtained for an age was not straightforward. We present two examples to study this relationship.

A four-year-old boy is 108.2cm and 14.5kg. According to his age, both of his measurements are *appropriate and within range for the age* (body mass is above the 10th percentile, and body height is below the 90th percentile). Examining the child's body-mass-body-length relationship based on the weight-for-height percentile figure, we can state that the intersection point of the two co-ordinates is well below the 3rd percentile, and the *child is therefore underweight compared to his body height (weight-deficient)*.

A five-year-old boy's body height is 105.4cm and his body weight is 21.9kg, so both measurements are *appropriate and within range for the age*. The child's body-weight-for-body-height percentile figure (*Figure 3.11*) shows that his *body mass is larger compared to his body height: the child is overweight (has significant body weight excess)*.

Based on the weight-for-height value, the *child's nutritional condition corresponds to his/her body height* between the 25th and 75th percentile. Between the 25th and 10th, as well as 75th and 90th percentile, the *child's nutritional condition is adequate for his/her body height*. Between the 3rd and 10th percentile the *child's nutritional condition as compared to his/her body height is less than adequate*. Between the 90th and 97th percentile the child is *better fed than adequate*. Below the 3rd percentile the *child is underweight as compared to his/her body height, i.e. thin (weight-deficient)*. Above the 97th percentile, the *child is overweight as compared to his/her body height (has a significant body weight excess)*.

Body mass index (BMI)

The *body mass index* (BMI) shows the relationship between body weight and body height, by providing the number of body weight kilograms per 'square metre' of body height: $BMI = \text{body mass (kg)} / \text{body height}^2 (\text{m}^2)$.

BMI is suitable for determining the status of overweight or obese, because it has a strong correlation with body weight (Pearson's $R=0.84$), though its correlation with body height is weak ($R=0.20$) (Bodzsár 1991).

To define the extent of obesity, WHO recommendations (1998) are usually taken into account: <18.49 underweight (weight-deficient); $18.5-24.9$ adequate nutritional condition (normal weight); $25.0-29.9$ overweight (pre-obesity); $30.0-39.9$ real overweight (obese); and BMI of 40.0 and higher values fall under the category of pathological overweight (obesity) (WHO TRS 1995).

Evaluation of a child's nutritional condition based on BMI may be performed only by applying the corresponding age-related BMI reference percentiles. The calculated BMI of the studied child is evaluated in the standard manner, after taking BMI percentile bands into account (see the evaluation described for body weight for body height).

Besides these features, BMI is widely suitable for screening overweight and obesity in childhood, with the method evaluated by Cole *et al.* (2000). It can be used easily because it is simple, and the necessary sizes are widely available (Gyenis *et al.* 2004).

The 85th percentile curves of BMI as the cut-off values for screening overweight in childhood were estimated according to the recommendations of Cole and his colleagues (2000). By comparing the percentile distributions of children's BMI from different populations, Cole and his colleagues (2000) found that the 85th percentile of BMI coincides with the adult cut-off point for overweight ($25\text{kg}/\text{m}^2$) at the age of 18 years in both sexes.

In some cases, however, BMI only provides information on whether the studied individual has a body mass surplus compared to his/her body height. It does not offer information about whether the body mass excess is primarily made up of muscle or adipose tissue.

Head circumference

When measuring head circumference the steel measuring tape is held around the child's head in such a way that it passes through the glabella landmark point at the front, through the opistocranium landmark point at the back, and over the maximum bulge of the occiput.

Reference means and reference percentiles of head circumference are shown in *Tables 3.9* and *3.10*. Reference percentile curves of head circumference for 0 to 36 months of age can be seen in *Figures 3.17* and *3.18*, while reference curves for two to 18 years are shown in *Figures 3.19* and *3.20*.

Chest circumference

The steel measuring tape is placed directly under the lower shoulder blade angles at the back, then after leading it around the chest it is placed precisely above the areola of the mamillas. The measurement is taken following exhalation of a relaxed inhalation.

The chest circumference size of the examined child can be evaluated based on the reference data in *Tables 3.11* and *3.12*, or by using the reference percentile curves. Reference percentiles for 0 to 36 months can be seen in *Figures 3.21* and *3.22*, while reference curves for two to 18 years are shown in *Figures 3.23* and *3.24*.

Abdominal circumference at the navel

The steel measuring tape is led around at the height of the navel so that the tape also runs in a horizontal position at the level of the navel at the back. This size is only measured from the age of seven.

Tables 3.13 and 3.14, as well as *Figures 3.25 and 3.26* contain the reference data for abdominal circumference.

The not entirely regular shape of the percentile curves led us to correct for the unevenness by fitting a 2nd degree polynomial. The connected values can be seen in *Tables 3.15 and 3.16*. Percentiles curves drawn by the 2nd degree polynomial are shown in *Figures 3.27 and 3.28*.

Skinfold thicknesses (triceps, subscapula, abdomen, and iliospinale)

In order to judge the health status of a child, it is important to evaluate nutritional condition besides measuring the body mass, body height, and establishing the weight-for-height (length) relationship and calculating BMI. One important tool for this is measurement and evaluation of the thickness of the subdermal connective tissue, so-called skinfolds in different body areas.

We measure the *triceps* skinfold on the dorsal surface of the upper arm, at half the distance between the acromion and the elbow (it is expedient to mark it with a dermatograph), so that the longitudinal axis of the raised skinfold overlaps with the upper arm longitudinal axis.

We measure the *subscapular* skinfold at approximately two fingers' distance under the scapular point, so that the skinfold axis closes an approximately 45° angle with the body's axis of symmetry.

We measure the *abdominal* skinfold 5cm left of the navel on the stomach, the axis of the skinfold is horizontal.

We measure the skinfold at the *iliospinale* (*spina iliaca anterior superior*) above the anterior, the downward-bending angle of the winged upper portion of the ileum.

These measurements were taken on the left side of the body with a Lange-type skinfold-caliper.

From our reference data population we compiled the tables containing the reference mean \bar{x} , the standard deviation (SD), and the reference percentiles (*Tables 3.17–3.24*) for data on the *triceps*, *subscapular*, *iliospinale* and *abdominal skinfolds*. According to international practice, percentiles pooled from the total values of the four skinfolds can be seen in *Tables 3.25 and 3.26*. Values in the tables are provided in millimetres. Skinfold thickness reference percentiles are found in *Figures 3.29–3.38*. Future analysis of skinfold measurements will include plotting the percentile curves on a logarithmic scale for international comparability.

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Table 3.1

Reference means and percentiles of body length/height from birth to the age of 18 years (boys)

Age	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (cm)						
				3	10	25	50	75	90	97
At birth	2 984	50.82	2.18	47.00	48.20	49.51	50.72	52.14	53.65	55.09
1 month	2 949	54.08	2.22	50.02	51.24	52.68	54.10	55.55	57.03	58.55
2 months	2 938	57.44	2.34	53.08	54.45	56.00	57.60	59.05	60.40	62.02
3 months	2 927	60.74	2.42	56.03	57.60	59.10	60.85	62.40	63.80	65.17
4 months	2 895	63.55	2.49	58.62	60.35	62.00	63.70	65.30	66.62	68.20
5 months	2 869	66.06	2.55	61.00	62.80	64.51	66.10	67.75	69.11	70.72
6 months	2 838	68.19	2.55	63.00	64.80	66.38	68.00	69.70	71.10	72.70
8 months	2 809	71.02	2.63	66.10	68.00	69.50	71.10	72.85	74.40	76.20
10 months	2 789	73.63	2.68	68.58	70.56	72.04	73.81	75.60	77.20	79.15
12 months	2 807	76.28	2.76	71.09	72.99	74.56	76.40	78.12	79.79	81.80
15 months	2 622	79.52	2.98	74.07	76.01	77.74	79.57	81.51	83.19	85.20
18 months	2 597	82.44	3.19	76.60	78.60	80.65	82.60	84.55	86.45	88.45
21 months	2 543	85.21	3.44	78.88	81.08	83.28	85.36	87.38	89.50	91.60
2 years	2 585	87.98	3.60	81.09	83.35	85.68	87.90	90.00	92.17	94.45
3 years	2 351	96.39	4.06	89.02	91.31	93.83	96.36	99.01	101.50	104.15
4 years	2 397	103.06	4.25	95.18	97.90	100.26	103.20	106.06	108.55	111.50
5 years	2 455	109.74	4.66	101.06	103.82	106.68	109.76	112.90	115.65	118.50
6 years	2 469	116.26	4.95	107.10	110.05	113.03	116.30	119.40	122.52	125.47
7 years	2 338	122.70	5.27	112.50	115.98	119.15	122.48	125.92	129.15	132.45
8 years	2 313	128.35	5.61	117.94	121.31	124.60	128.44	132.07	135.45	139.00
9 years	2 277	133.79	5.99	122.47	126.34	129.75	133.99	137.73	141.45	145.26
10 years	2 223	138.99	6.34	127.22	131.14	134.91	139.09	143.08	147.41	151.15
10.5 years	1 697	141.77	6.38	129.95	133.60	137.44	141.75	145.96	150.06	154.00
11 years	1 797	144.46	6.68	132.25	136.05	139.99	144.58	148.69	153.05	157.16
11.5 years	1 665	147.35	6.90	134.85	138.59	142.57	147.32	152.05	156.19	160.16
12 years	1 750	150.37	7.26	137.37	141.15	145.37	150.38	155.22	159.60	164.06
12.5 years	1 604	153.57	7.70	139.81	143.70	148.47	153.51	159.00	163.44	168.24
13 years	1 689	157.06	7.95	142.45	146.80	151.95	157.05	162.43	167.65	172.15
13.5 years	1 552	160.64	8.13	145.10	150.00	155.30	160.40	166.48	171.03	175.40
14 years	1 612	164.20	8.09	148.15	153.25	158.96	164.30	169.85	174.36	178.65
14.5 years	1 165	167.16	7.95	151.35	157.00	162.00	167.50	172.70	177.00	181.40
15 years	1 186	169.93	7.57	154.90	160.50	165.00	170.00	175.15	179.30	183.90
15.5 years	837	171.92	7.23	158.00	163.10	167.30	172.00	176.80	181.20	185.50
16 years	890	173.66	6.93	160.20	165.20	169.10	173.50	178.30	182.50	186.70
16.5 years	655	174.69	6.74	162.10	166.60	170.20	174.60	179.55	183.50	187.90
17 years	692	175.72	6.66	163.65	167.90	171.25	175.50	180.40	184.40	188.50
17.5 years	485	176.44	6.23	164.95	169.15	172.20	176.00	180.70	185.00	188.75
18 years	516	176.92	6.22	165.58	169.93	172.93	176.45	180.80	185.20	189.10

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.2

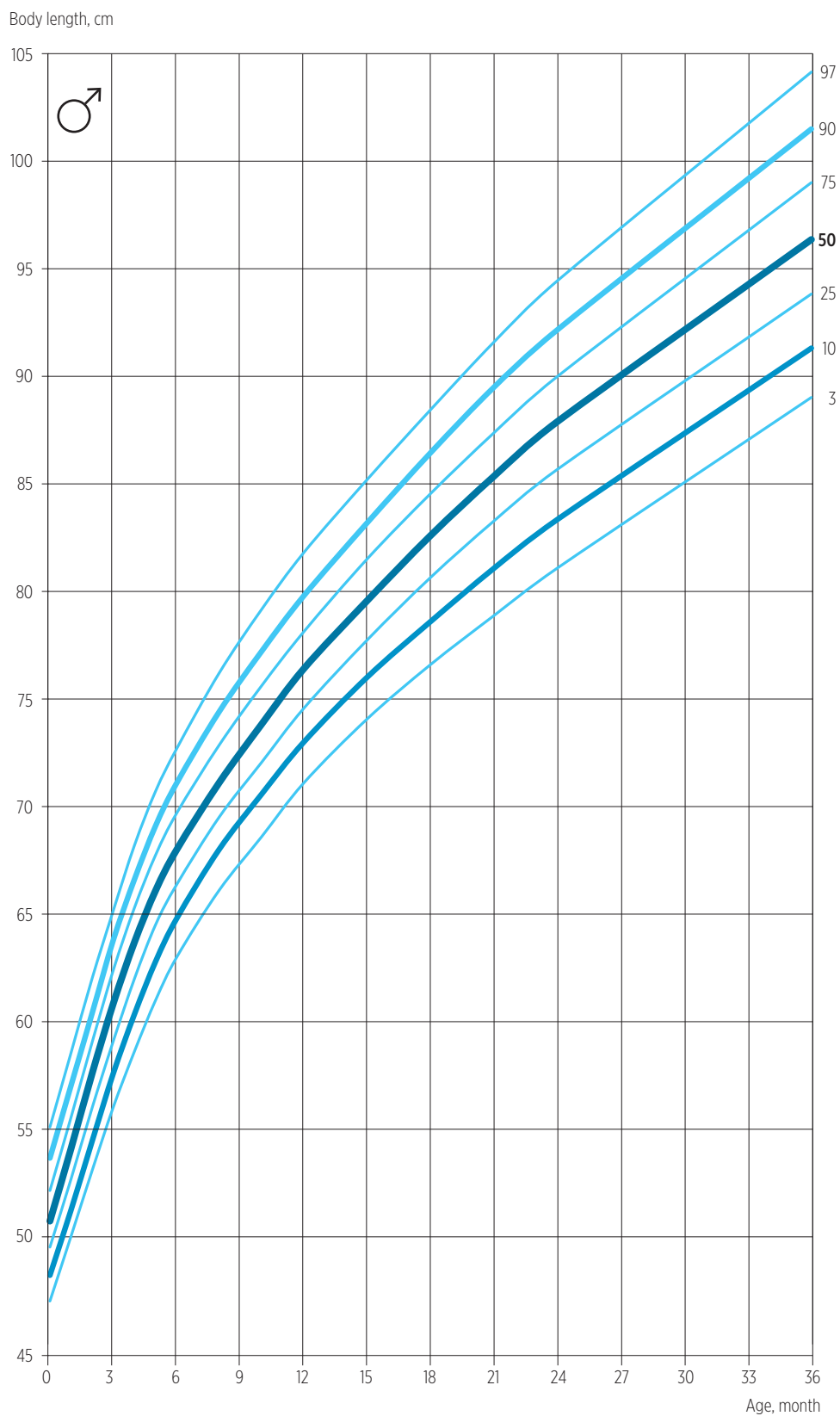
Reference means and percentiles of body length/height from birth to the age of 18 years (girls)

Age	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (cm)						
				3	10	25	50	75	90	97
At birth	2 701	50.15	2.07	46.60	47.61	48.82	50.04	51.48	52.85	54.20
1 month	2 662	53.30	2.06	49.45	50.70	52.03	53.22	54.59	56.06	57.45
2 months	2 653	56.42	2.15	52.35	53.77	55.05	56.45	57.80	59.20	60.60
3 months	2 622	59.48	2.25	55.25	56.68	58.07	59.30	60.80	62.20	63.70
4 months	2 603	62.15	2.28	58.00	59.45	60.72	62.10	63.60	65.00	66.50
5 months	2 577	64.52	2.35	60.24	61.67	63.06	64.56	66.00	67.45	69.00
6 months	2 543	66.60	2.45	62.05	63.60	64.90	66.48	67.96	69.39	71.00
8 months	2 519	69.42	2.50	65.00	66.60	68.05	69.70	71.15	72.55	74.30
10 months	2 480	72.03	2.59	67.25	68.92	70.56	72.22	73.81	75.42	77.20
12 months	2 495	74.76	2.68	69.58	71.35	72.90	74.80	76.53	78.30	80.16
15 months	2 325	78.09	2.96	72.52	74.38	76.09	78.07	80.04	81.85	83.88
18 months	2 294	81.15	3.18	75.14	77.16	79.12	81.20	83.13	85.12	87.12
21 months	2 263	84.02	3.37	77.65	79.85	82.00	84.08	86.10	88.10	90.20
2 years	2 304	86.88	3.54	80.03	82.31	84.55	86.50	88.80	91.00	93.12
3 years	2 094	95.56	4.08	87.80	90.32	93.05	95.53	98.18	100.75	103.05
4 years	2 127	102.31	4.25	94.50	97.01	99.80	102.60	105.28	108.20	110.90
5 years	2 207	109.07	4.67	100.37	103.24	106.15	109.17	112.15	115.11	118.02
6 years	2 209	115.55	4.96	106.23	109.30	112.31	115.61	118.83	122.05	125.19
7 years	2 106	122.00	5.29	112.02	115.36	118.40	121.90	125.46	128.61	132.16
8 years	2 082	127.64	5.64	117.20	120.50	124.04	127.58	131.28	135.00	138.50
9 years	2 074	133.15	5.98	121.95	125.68	129.28	133.17	137.22	140.74	144.72
10 years	2 022	138.84	6.51	126.80	130.75	134.64	138.80	143.08	147.06	151.20
10.5 years	1 560	142.06	6.68	129.45	133.50	137.65	142.21	146.44	150.57	154.60
11 years	1 644	145.48	6.97	132.52	136.44	140.85	145.60	150.13	154.37	158.40
11.5 years	1 532	148.83	7.18	135.50	139.50	144.11	149.02	153.62	158.14	162.14
12 years	1 618	152.01	7.10	138.75	142.50	147.36	152.25	156.91	161.08	165.04
12.5 years	1 501	154.82	6.93	141.80	145.55	150.23	155.13	159.58	163.52	167.35
13 years	1 589	157.33	6.65	144.87	148.60	153.05	157.55	162.02	165.78	169.52
13.5 years	1 452	159.41	6.36	147.56	151.23	155.33	159.70	163.82	167.54	171.22
14 years	1 530	161.07	6.12	149.70	153.30	157.17	161.17	165.30	168.90	172.67
14.5 years	1 138	162.26	6.15	151.00	154.60	158.50	162.40	166.50	170.20	173.90
15 years	1 161	163.38	6.09	152.00	155.70	159.60	163.50	167.70	171.30	174.95
15.5 years	839	164.22	5.98	152.80	156.40	160.40	164.40	168.70	172.35	175.90
16 years	882	164.92	6.16	153.38	157.10	161.00	165.20	169.40	173.10	176.70
16.5 years	631	165.61	6.02	153.65	157.50	161.60	165.80	170.00	173.70	177.40
17 years	689	165.96	6.03	154.10	158.00	162.00	166.40	170.60	174.30	177.95
17.5 years	467	166.75	6.09	154.40	158.50	162.50	166.90	171.00	174.80	178.40
18 years	523	167.20	6.13	154.80	159.00	163.10	167.50	171.40	175.10	178.70

Based on the reference data of the Hungarian Longitudinal Growth Study.

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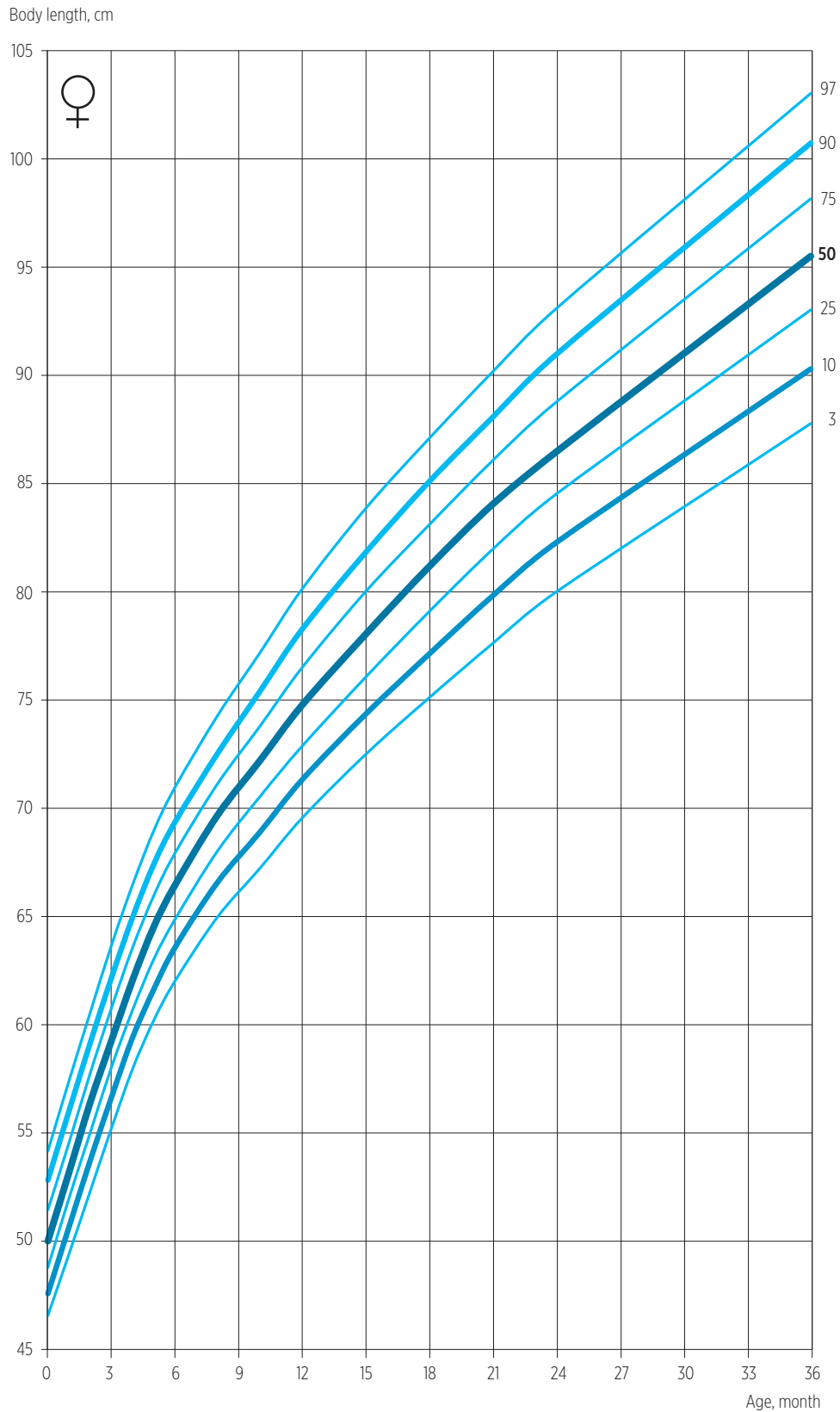
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Figure 3.1

Reference percentiles of body length/height from birth to the age of 3 years (boys)



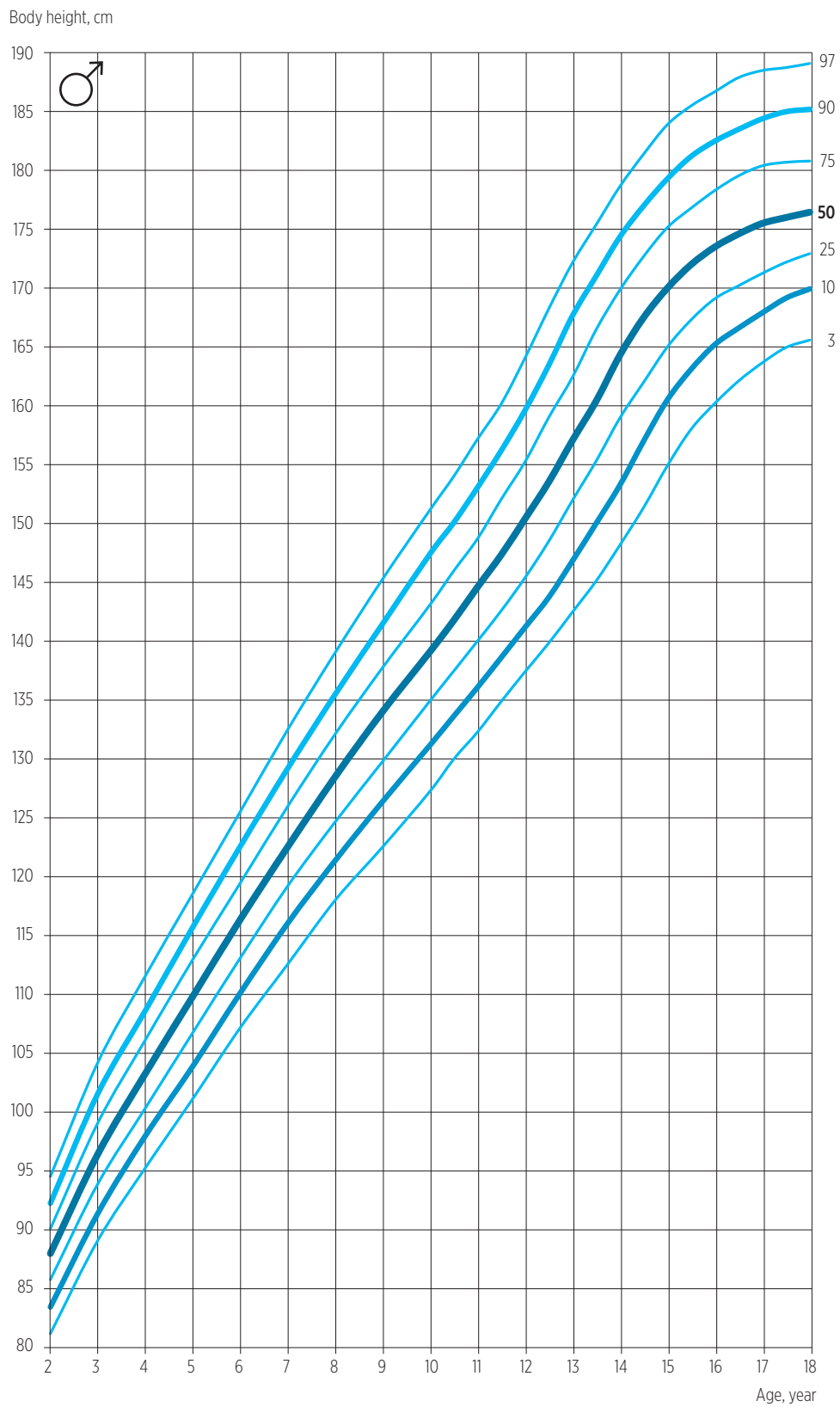
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Figure 3.2

Reference percentiles of body length/height from birth to the age of 3 years (girls)



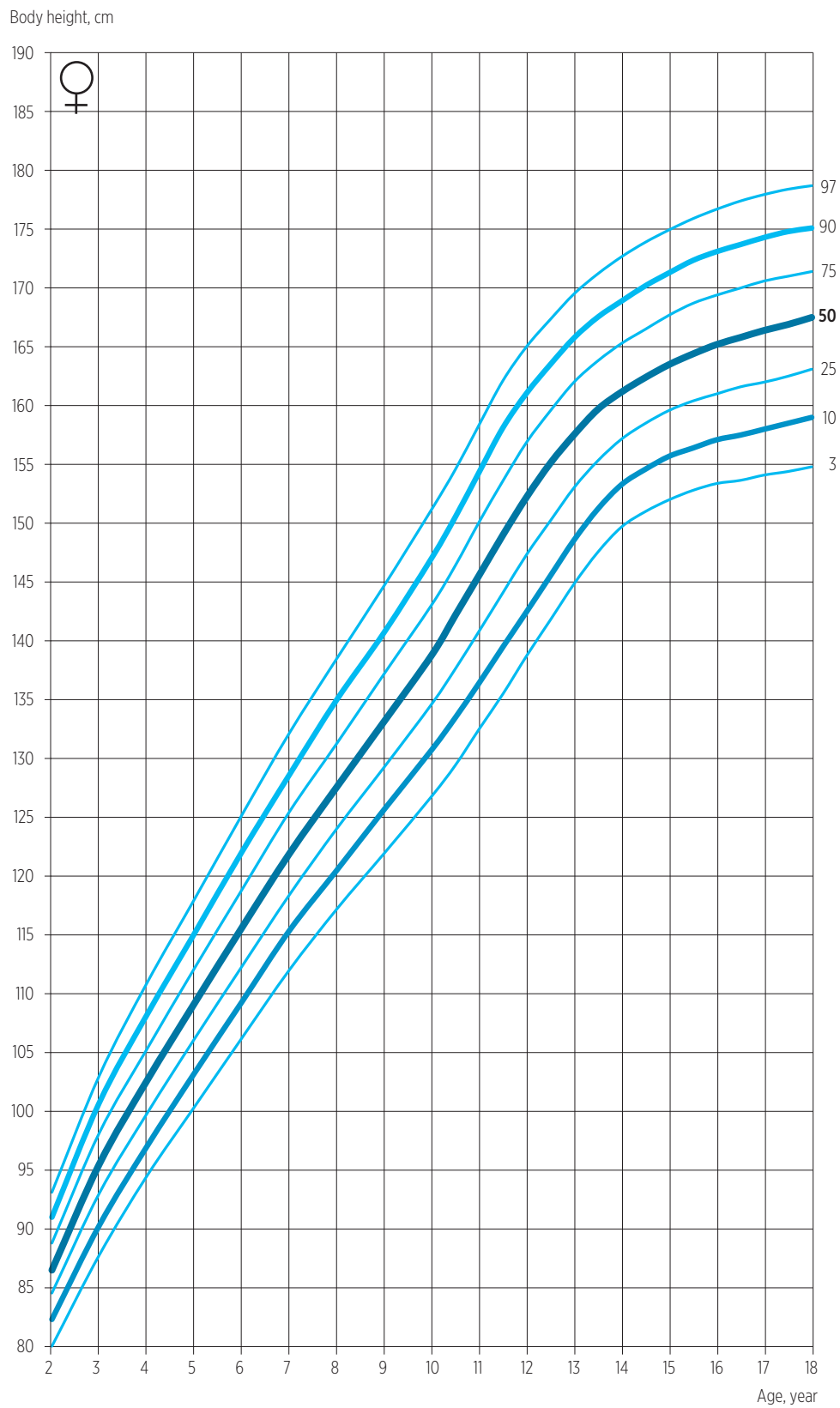
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Figure 3.3

Reference percentiles of body length/height from the age of 2 to 18 years (boys)



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Figure 3.4

Reference percentiles of body length/height from the age of 2 to 18 years (girls)

Table 3.3

Reference means and percentiles of body weight from birth to the age of 18 years (boys)

Age	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (kg)						
				3	10	25	50	75	90	97
At birth	2 990	3.31	0.42	2.52	2.73	3.00	3.30	3.60	3.88	4.17
1 month	2 949	4.09	0.49	3.24	3.52	3.82	4.15	4.50	4.80	5.12
2 months	2 939	5.05	0.57	4.00	4.31	4.67	5.01	5.42	5.75	6.12
3 months	2 929	5.92	0.64	4.70	5.07	5.51	5.90	6.32	6.70	7.14
4 months	2 898	6.67	0.71	5.35	5.75	6.20	6.65	7.10	7.50	8.03
5 months	2 874	7.30	0.76	5.90	6.32	6.78	7.30	7.78	8.26	8.80
6 months	2 842	7.84	0.82	6.35	6.79	7.25	7.81	8.34	8.83	9.40
8 months	2 815	8.64	0.92	7.02	7.50	8.00	8.60	9.25	9.81	10.45
10 months	2 793	9.35	0.99	7.55	8.10	8.69	9.31	10.01	10.60	11.31
12 months	2 810	10.01	1.07	8.07	8.69	9.29	9.95	10.70	11.32	12.10
15 months	2 625	10.73	1.15	8.65	9.39	10.00	10.69	11.50	12.20	13.00
18 months	2 600	11.41	1.24	9.23	10.00	10.65	11.36	12.25	13.00	13.85
21 months	2 546	12.04	1.33	9.72	10.55	11.25	11.98	12.93	13.76	14.67
2 years	2 590	12.66	1.43	10.19	10.99	11.78	12.55	13.58	14.45	15.49
3 years	2 353	14.82	1.84	11.93	12.70	13.60	14.70	15.95	17.02	18.61
4 years	2 398	16.68	2.17	13.21	14.19	15.20	16.49	17.99	19.31	21.47
5 years	2 455	18.79	2.70	14.91	16.00	17.01	18.51	20.03	22.00	24.58
6 years	2 469	21.24	3.41	16.48	17.70	19.00	20.60	22.98	25.18	28.82
7 years	2 335	24.07	4.19	18.19	19.90	21.21	23.31	25.99	29.21	33.66
8 years	2 306	27.12	5.17	20.03	22.01	23.78	26.01	29.19	33.62	39.51
9 years	2 275	30.42	6.31	22.30	24.32	26.29	29.02	32.70	38.52	45.98
10 years	2 223	34.05	7.65	24.49	26.71	29.01	32.20	36.73	44.30	53.23
10.5 years	1 691	36.11	8.42	25.82	28.03	30.36	33.93	39.20	47.60	57.11
11 years	1 794	38.24	9.26	27.00	29.48	32.02	35.80	42.03	50.95	61.03
11.5 years	1 662	40.61	10.06	28.30	31.00	33.83	37.76	45.02	54.46	64.97
12 years	1 750	43.00	10.73	29.62	32.50	35.65	40.08	48.00	57.74	68.60
12.5 years	1 604	45.73	11.33	31.00	34.26	37.88	42.90	51.09	61.06	72.10
13 years	1 688	48.58	11.79	32.80	36.16	40.21	45.99	54.20	64.35	75.40
13.5 years	1 550	51.52	12.09	34.70	38.51	43.01	49.32	57.42	67.30	78.20
14 years	1 616	54.33	12.23	36.65	41.00	45.99	52.35	60.20	69.97	80.55
14.5 years	1 166	56.95	11.89	39.01	43.78	48.90	55.12	62.90	72.41	82.60
15 years	1 189	59.55	11.90	41.68	46.36	51.65	57.62	65.15	74.65	84.65
15.5 years	837	61.60	11.57	44.20	49.04	53.95	59.65	66.95	76.50	86.50
16 years	890	63.49	11.34	46.48	51.36	56.05	61.50	68.78	78.20	88.00
16.5 years	654	65.35	11.45	48.78	53.10	57.62	63.35	70.45	79.90	89.20
17 years	692	66.72	11.38	50.58	54.80	59.22	64.96	72.06	81.12	90.28
17.5 years	485	67.88	10.49	52.05	55.93	60.30	66.30	73.38	82.20	91.30
18 years	516	68.65	10.68	52.95	56.97	61.49	67.35	74.32	83.00	92.00

Based on the reference data of the Hungarian Longitudinal Growth Study.
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Table 3.4

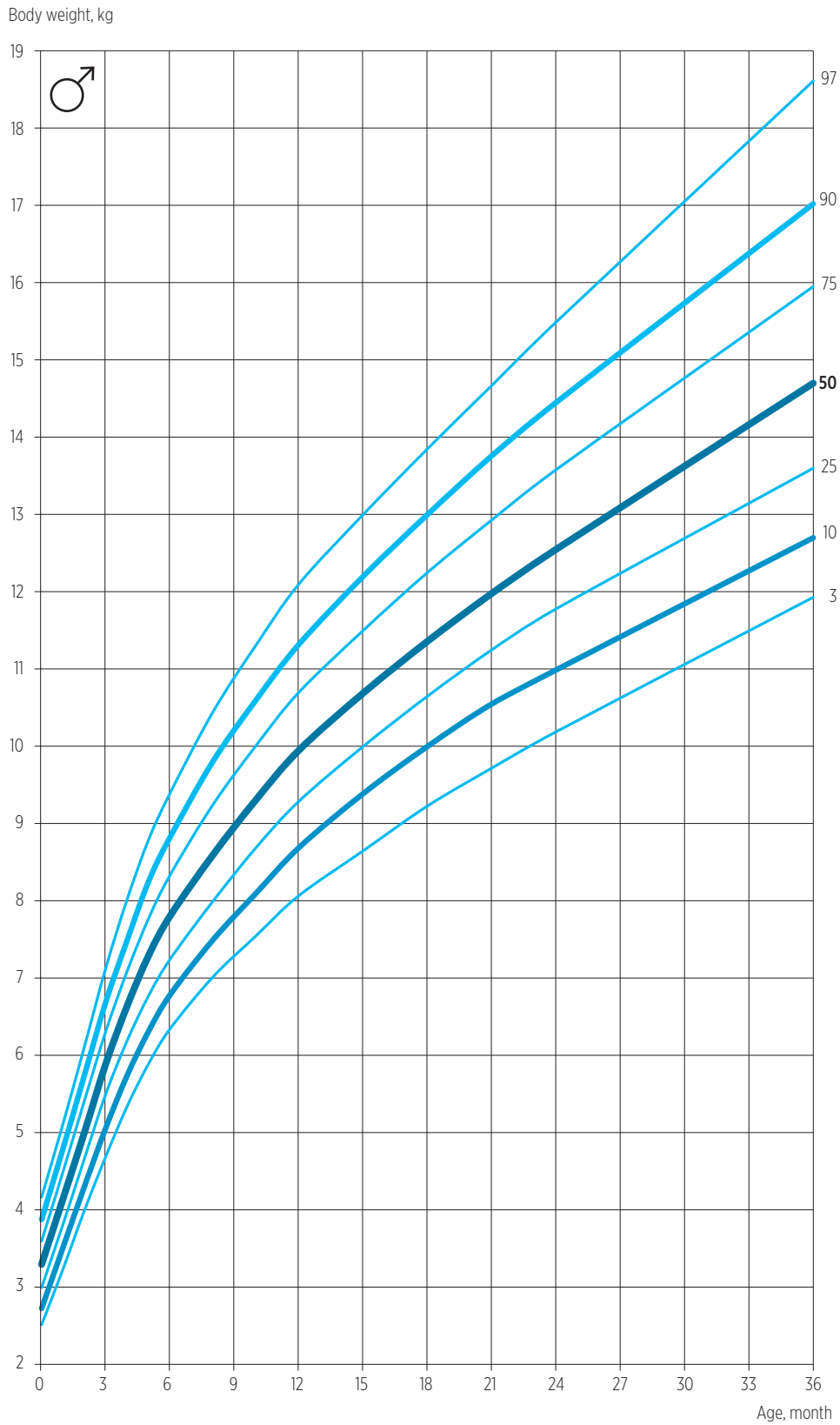
Reference means and percentiles of body weight from birth to the age of 18 years (girls)

Age	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (kg)						
				3	10	25	50	75	90	97
At birth	2 703	3.20	0.39	2.49	2.70	2.90	3.15	3.40	3.60	3.9
1 month	2 662	3.89	0.44	3.12	3.40	3.65	3.95	4.22	4.50	4.82
2 months	2 654	4.72	0.49	3.80	4.10	4.40	4.73	5.05	5.37	5.70
3 months	2 622	5.49	0.58	4.47	4.80	5.10	5.48	5.86	6.25	6.63
4 months	2 604	6.18	0.64	5.06	5.40	5.74	6.15	6.60	7.01	7.46
5 months	2 579	6.77	0.70	5.55	5.93	6.30	6.75	7.23	7.70	8.19
6 months	2 546	7.29	0.76	5.99	6.37	6.75	7.23	7.75	8.25	8.80
8 months	2 522	8.06	0.84	6.62	7.05	7.46	8.00	8.60	9.20	9.80
10 months	2 483	8.76	0.92	7.10	7.61	8.10	8.70	9.36	10.00	10.63
12 months	2 496	9.42	1.01	7.60	8.16	8.70	9.30	10.01	10.77	11.44
15 months	2 326	10.15	1.10	8.25	8.85	9.45	10.12	10.86	11.60	12.40
18 months	2 293	10.85	1.21	8.85	9.50	10.10	10.80	11.60	12.42	13.28
21 months	2 262	11.49	1.31	9.35	10.10	10.70	11.46	12.29	13.20	14.17
2 years	2 307	12.15	1.41	9.82	10.56	11.25	12.04	13.00	13.95	15.00
3 years	2 094	14.37	1.84	11.35	12.30	13.16	14.10	15.32	16.68	18.00
4 years	2 127	16.30	2.20	12.80	13.90	14.90	16.01	17.60	19.15	21.00
5 years	2 206	18.43	2.77	14.35	15.50	16.70	18.08	19.85	21.81	24.35
6 years	2 209	20.84	3.48	15.92	17.22	18.51	20.29	22.51	24.88	28.15
7 years	2 102	23.56	4.25	17.65	19.10	20.68	22.80	25.48	28.35	32.65
8 years	2 077	26.50	5.17	19.50	21.09	23.01	25.49	28.80	32.77	37.99
9 years	2 071	29.71	6.12	21.48	23.32	25.49	28.49	32.39	37.70	44.00
10 years	2 023	33.33	7.22	23.52	25.85	28.48	31.95	36.60	42.70	50.01
10.5 years	1 560	35.46	7.74	24.70	27.29	30.20	34.00	39.01	45.42	53.03
11 years	1 642	38.07	8.53	25.90	29.02	32.03	36.60	41.80	48.50	56.15
11.5 years	1 532	40.68	9.23	27.55	30.80	34.05	39.20	45.05	51.80	59.50
12 years	1 615	43.42	9.62	29.50	32.90	36.53	42.07	48.05	55.30	62.80
12.5 years	1 494	45.96	9.67	31.55	34.98	39.06	44.80	50.90	58.30	66.20
13 years	1 589	48.50	9.65	33.95	37.38	41.67	47.20	53.20	60.95	69.10
13.5 years	1 450	50.70	9.62	36.25	39.80	44.01	49.30	55.30	63.16	71.50
14 years	1 526	52.60	9.59	38.63	42.02	45.98	51.20	57.02	64.97	73.30
14.5 years	1 137	54.05	9.35	40.40	43.90	47.85	52.85	58.50	66.50	75.00
15 years	1 160	55.44	9.61	41.65	45.35	49.50	54.20	59.74	67.73	76.25
15.5 years	840	56.78	9.35	42.76	46.60	50.80	55.38	60.85	68.75	77.50
16 years	883	57.42	9.21	43.65	47.65	51.85	56.28	61.85	69.68	78.60
16.5 years	634	58.27	9.55	44.35	48.40	52.65	56.96	62.80	70.45	79.60
17 years	692	58.71	9.39	44.98	49.00	53.30	57.50	63.40	71.18	80.35
17.5 years	465	59.63	9.57	45.45	49.60	53.75	57.99	63.90	71.75	81.00
18 years	520	60.10	9.38	45.94	50.05	54.25	58.34	64.20	72.30	81.50

Based on the reference data of the Hungarian Longitudinal Growth Study.

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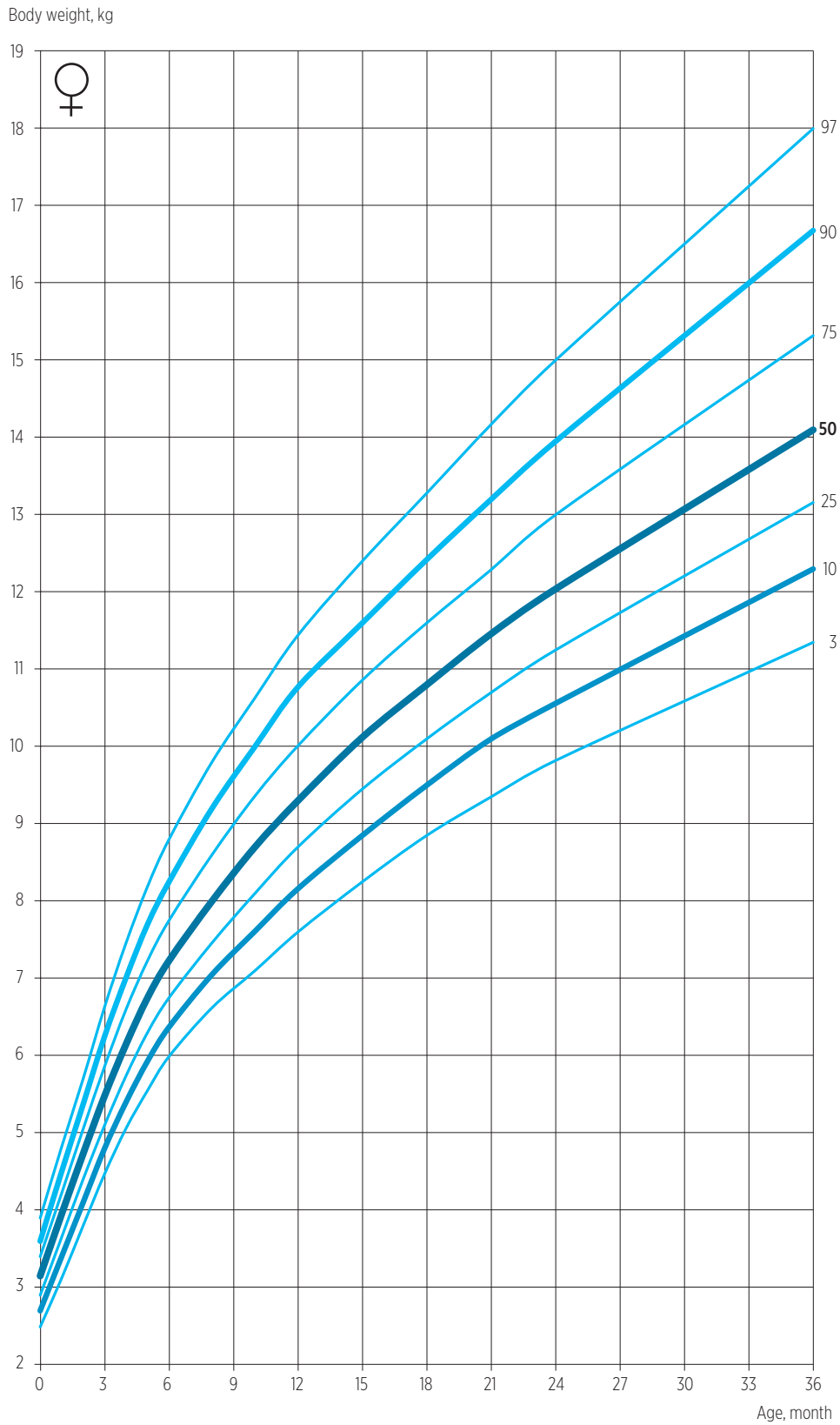
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Figure 3.5

Reference percentiles of body weight from birth to the age of 3 years (boys)



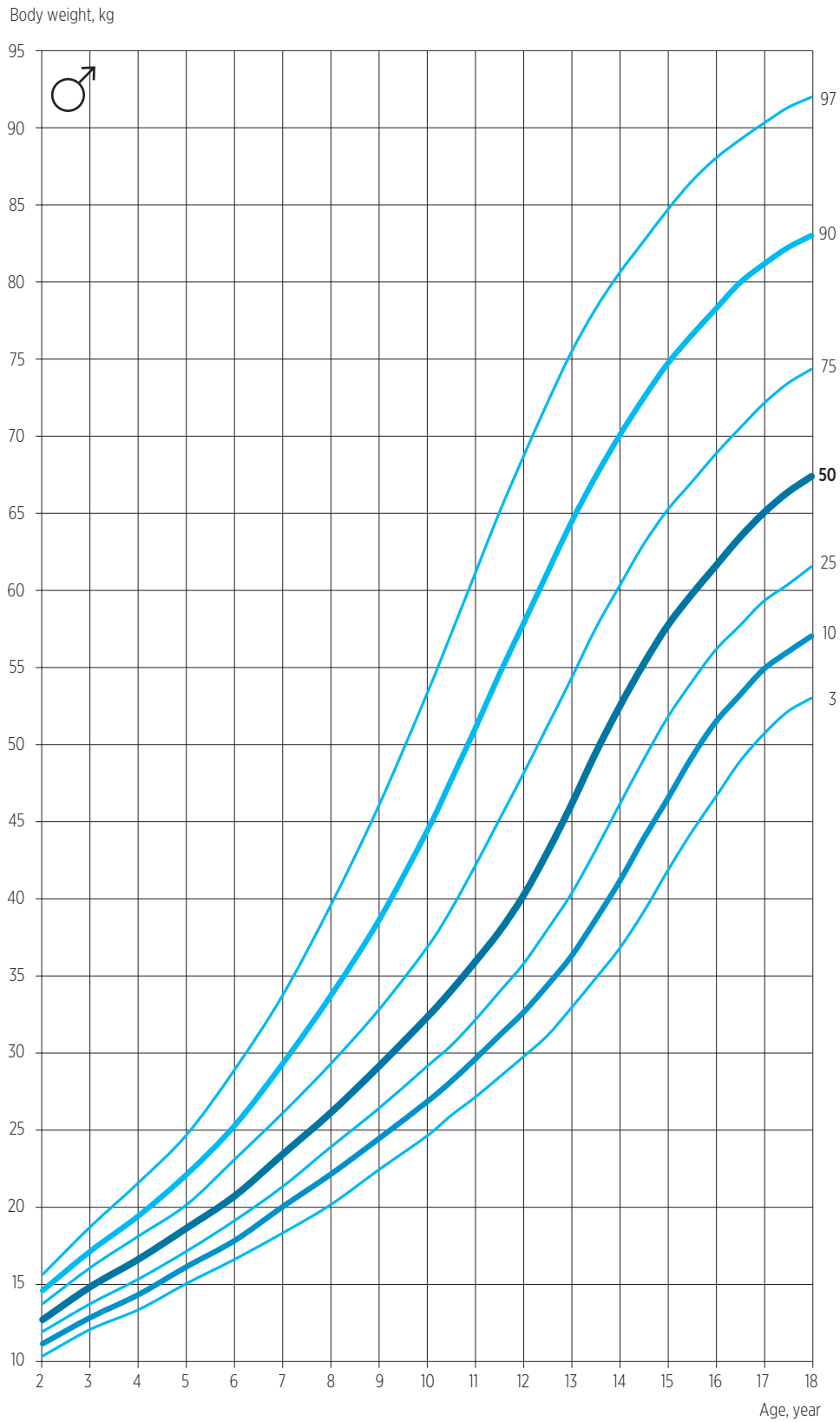
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Figure 3.6

Reference percentiles of body weight from birth to the age of 3 years (girls)



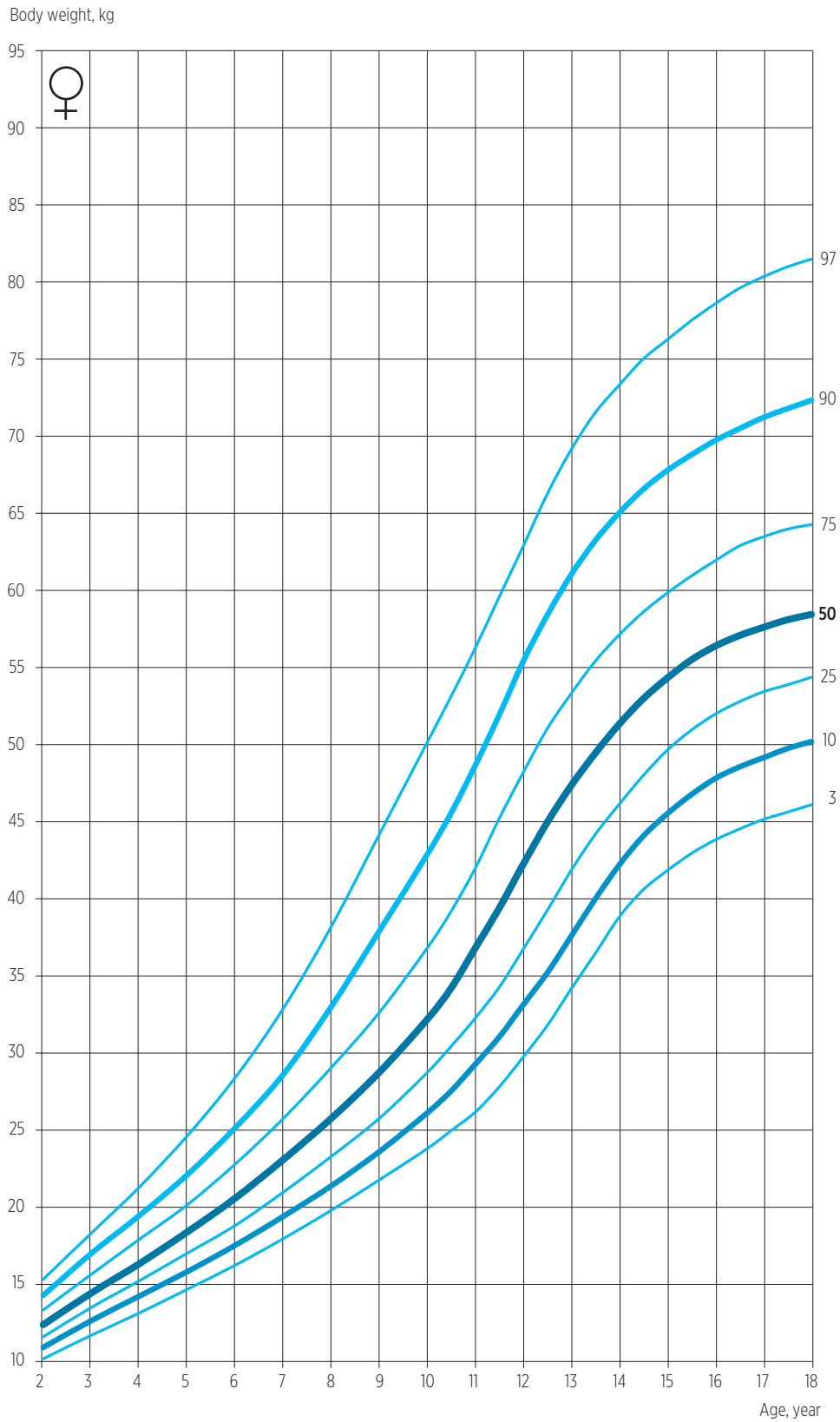
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Figure 3.7

Reference percentiles of body weight from the age of 2 to 18 years (boys)



Based on the reference data of the Hungarian Longitudinal Growth Study.

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Figure 3.8

Reference percentiles of body weight from the age of 2 to 18 years (girls)

Table 3.5

Change of weight-for-height/length mean and percentiles from birth to the age of 18 years (boys)

Body height/ length) (cm)	Case number (N)	Mean \bar{x} (kg)	SD	Percentiles (kg)						
				3	10	25	50	75	90	97
47	156	2.79	0.20	2.50	2.54	2.62	2.80	2.95	3.07	3.22
48	316	2.96	0.26	2.55	2.65	2.80	2.94	3.10	3.32	3.50
49	517	3.12	0.28	2.65	2.75	2.90	3.10	3.30	3.45	3.67
50	716	3.32	0.33	2.80	2.92	3.10	3.30	3.50	3.70	4.00
51	767	3.48	0.35	2.90	3.05	3.25	3.45	3.65	3.90	4.20
52	808	3.73	0.39	3.05	3.25	3.45	3.73	3.95	4.20	4.45
53	908	3.96	0.44	3.11	3.45	3.70	3.95	4.20	4.50	4.90
54	899	4.22	0.50	3.40	3.65	3.90	4.18	4.50	4.80	5.27
55	840	4.43	0.50	3.50	3.90	4.12	4.40	4.70	5.05	5.45
56	877	4.75	0.55	3.85	4.10	4.40	4.70	5.05	5.40	5.90
57	875	4.99	0.58	3.95	4.30	4.65	5.00	5.30	5.65	6.15
58	917	5.25	0.58	4.25	4.58	4.90	5.20	5.60	5.95	6.35
59	908	5.54	0.58	4.60	4.90	5.15	5.50	5.80	6.20	6.70
60	953	5.79	0.59	4.80	5.09	5.40	5.75	6.10	6.55	6.90
61	972	6.07	0.57	5.10	5.38	5.66	6.03	6.40	6.80	7.25
62	1054	6.35	0.63	5.30	5.60	5.96	6.30	6.70	7.10	7.60
63	1079	6.57	0.60	5.60	5.88	6.14	6.50	6.90	7.32	7.75
64	1155	6.85	0.62	5.85	6.15	6.40	6.80	7.20	7.62	8.00
65	1183	7.08	0.62	6.00	6.35	6.68	7.00	7.50	7.90	8.31
66	1128	7.34	0.65	6.20	6.55	6.90	7.30	7.70	8.15	8.65
67	1145	7.58	0.64	6.50	6.80	7.15	7.55	8.00	8.40	8.87
68	1215	7.87	0.69	6.65	7.02	7.40	7.85	8.30	8.80	9.20
69	1105	8.10	0.71	6.90	7.20	7.60	8.07	8.55	9.00	9.45
70	1085	8.40	0.74	7.10	7.50	7.90	8.40	8.85	9.35	9.90
71	994	8.69	0.73	7.30	7.80	8.20	8.69	9.20	9.60	10.05
72	1088	8.90	0.80	7.50	7.90	8.34	8.90	9.40	10.00	10.45
73	1017	9.20	0.80	7.85	8.20	8.65	9.15	9.70	10.25	10.83
74	1074	9.48	0.82	8.02	8.50	8.90	9.45	10.00	10.50	11.13
75	956	9.67	0.84	8.27	8.65	9.01	9.65	10.15	10.80	11.40
76	1050	9.99	0.86	8.50	8.97	9.40	10.00	10.50	11.10	11.70
77	846	10.18	0.89	8.70	9.10	9.60	10.05	10.70	11.36	12.15
78	995	10.44	0.93	8.85	9.30	9.80	10.40	11.00	11.61	12.20
79	879	10.73	0.93	9.20	9.60	10.05	10.66	11.30	12.00	12.70
80	897	10.89	0.93	9.20	9.80	10.30	10.80	11.50	12.10	12.80
81	826	11.06	0.96	9.50	9.95	10.40	11.00	11.60	12.40	13.00
82	923	11.37	0.99	9.70	10.20	10.70	11.30	12.00	12.70	13.20
83	890	11.58	0.99	9.90	10.40	10.90	11.50	12.20	13.00	13.60
84	863	11.72	1.04	10.00	10.50	11.00	11.60	12.30	13.00	13.90
85	731	11.98	1.02	10.10	10.80	11.30	12.00	12.60	13.20	14.00
86	753	12.29	1.02	10.60	11.00	11.60	12.20	13.00	13.60	14.40
87	653	12.44	1.06	10.50	11.00	11.70	12.40	13.00	13.90	14.50
88	565	12.66	1.04	10.80	11.40	12.00	12.60	13.30	14.00	14.90
89	537	12.97	1.19	11.00	11.60	12.20	12.80	13.70	14.50	15.20
90	486	13.21	1.23	11.30	12.00	12.50	13.00	14.00	14.70	15.80
91	352	13.47	1.15	11.70	12.00	12.70	13.50	14.10	15.00	15.80
92	337	13.67	1.10	12.00	12.50	13.00	13.50	14.20	15.00	16.00

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Table 3.5

Change of weight-for-height/length mean and percentiles from birth to the age of 18 years (boys) (Continuation)

Body height/ length) (cm)	Case number (N)	Mean \bar{x} (kg)	SD	Percentiles (kg)						
				3	10	25	50	75	90	97
93	268	13.98	1.33	11.70	12.50	13.10	14.00	14.80	15.50	16.80
94	311	14.23	1.34	12.00	12.50	13.30	14.10	15.00	15.50	17.00
95	336	14.48	1.26	12.20	13.00	13.70	14.30	15.10	16.00	17.00
96	300	14.64	1.22	12.50	13.00	13.90	14.80	15.50	16.20	16.60
97	310	15.05	1.30	13.00	13.50	14.00	15.00	15.60	16.80	18.00
98	404	15.24	1.36	12.80	13.60	14.20	15.00	16.00	17.00	18.00
99	379	15.50	1.40	13.00	14.00	14.60	15.30	16.40	17.40	18.50
100	349	15.75	1.37	13.50	14.00	15.00	15.60	16.50	17.50	18.50
101	310	16.15	1.58	14.00	14.50	15.20	16.00	16.90	17.80	19.20
102	360	16.32	1.49	13.50	14.50	15.20	16.30	17.20	18.20	19.00
103	389	16.67	1.59	14.00	14.80	15.50	16.50	17.50	19.00	20.00
104	349	17.03	1.54	14.20	15.10	16.00	17.00	18.00	19.00	20.20
105	399	17.27	1.66	14.80	15.20	16.00	17.00	18.20	19.20	20.50
106	365	17.49	1.51	15.00	15.80	16.50	17.50	18.20	19.10	21.40
107	348	17.93	1.66	15.30	16.00	16.80	17.80	19.00	20.00	21.50
108	362	17.96	1.75	15.00	16.00	17.00	18.00	19.00	20.00	22.00
109	362	18.61	1.99	15.80	16.50	17.30	18.40	19.50	21.00	23.00
110	381	18.85	1.77	16.10	16.80	17.50	18.80	20.00	21.00	22.00
111	365	19.31	1.90	16.20	17.10	18.00	19.00	20.10	21.50	23.30
112	392	19.67	2.05	16.50	17.50	18.10	19.50	20.70	22.20	24.00
113	397	19.94	2.11	16.50	17.50	18.60	19.90	21.00	22.00	25.00
114	369	20.31	2.22	16.80	18.00	19.00	20.00	21.50	22.80	25.30
115	387	20.61	1.97	17.50	18.30	19.20	20.30	21.60	23.30	25.00
116	374	21.08	2.23	17.90	18.50	19.70	21.00	22.20	23.50	25.00
117	372	21.60	2.22	18.00	19.20	20.00	21.20	22.80	24.20	26.30
118	410	21.81	2.14	18.60	19.60	20.20	21.50	23.00	24.50	26.80
119	401	22.52	2.69	19.00	19.80	20.70	22.00	23.70	26.00	29.50
120	375	22.71	2.75	18.60	20.00	21.00	22.40	24.00	26.00	29.20
121	368	23.27	2.94	19.20	20.20	21.50	22.70	24.50	26.50	30.00
122	370	23.45	2.38	20.00	21.00	22.00	23.00	24.50	26.30	29.00
123	407	24.22	2.68	20.00	21.50	22.50	24.00	25.40	27.40	29.50
124	410	24.76	2.74	20.50	21.80	23.00	24.50	26.00	28.30	30.50
125	441	25.39	3.55	20.50	22.00	23.30	25.00	26.50	29.20	34.00
126	394	25.78	3.02	21.60	22.50	23.80	25.30	27.00	29.50	33.00
127	453	26.35	3.42	21.70	23.00	24.00	25.80	28.00	30.00	35.00
128	418	26.83	3.39	22.80	23.60	25.00	26.00	28.00	31.00	35.30
129	465	27.48	3.21	23.00	24.00	25.20	27.00	29.00	31.80	35.00
130	436	28.30	3.93	23.00	24.00	26.00	27.70	30.00	33.00	38.50
131	411	28.75	4.11	23.50	24.70	26.00	28.10	30.30	33.30	38.00
132	463	29.32	3.98	24.00	25.20	26.90	28.60	31.00	34.00	38.00
133	471	29.82	4.03	25.00	26.00	27.00	29.00	31.50	35.00	40.00
134	481	30.23	4.19	24.80	26.00	27.70	29.50	32.00	35.00	40.50
135	535	31.35	4.48	25.10	27.00	28.50	30.20	33.00	37.50	43.50
136	504	31.92	4.89	26.00	27.50	29.00	30.90	33.60	37.50	44.00
137	515	32.24	4.86	25.70	27.50	29.20	31.20	34.00	38.00	44.50
138	528	32.71	4.56	26.50	28.00	29.90	32.00	34.50	38.00	43.00

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.5

Change of weight-for-height/length mean and percentiles from birth to the age of 18 years (boys) (Continuation)

Body height/ length) (cm)	Case number (N)	Mean \bar{x} (kg)	SD	Percentiles (kg)						
				3	10	25	50	75	90	97
139	555	33.71	5.16	26.50	28.70	30.50	32.60	36.00	39.80	46.60
140	641	34.42	5.39	27.50	29.20	31.00	33.10	36.20	41.00	48.30
141	530	35.12	5.63	27.80	29.50	31.50	33.80	37.50	42.30	49.70
142	571	35.71	5.52	28.50	30.00	32.00	34.50	38.00	43.20	50.00
143	578	36.41	5.72	29.00	31.00	32.50	35.20	39.00	43.70	49.40
144	574	37.44	6.02	29.70	31.50	33.30	36.00	40.00	46.00	53.00
145	578	38.19	6.22	30.00	32.10	33.80	37.00	40.60	46.00	54.10
146	502	38.76	6.27	31.00	32.50	35.00	37.00	41.20	47.00	56.00
147	560	39.51	6.45	30.60	32.80	35.00	38.00	43.00	48.50	55.20
148	583	40.72	6.90	31.50	33.70	35.70	39.00	44.50	50.80	57.70
149	535	41.56	7.14	32.50	34.20	36.80	39.80	44.60	51.50	60.00
150	563	42.00	7.45	32.00	34.20	36.80	40.20	45.80	52.20	60.00
151	495	43.35	7.66	33.20	35.90	38.00	41.50	47.00	53.00	62.30
152	498	44.68	8.18	33.70	36.90	39.00	42.50	48.10	57.00	66.00
153	486	45.21	7.71	35.00	36.90	39.60	43.40	49.50	55.50	64.00
154	479	46.06	8.05	34.90	37.50	40.10	44.10	50.10	57.90	66.00
155	487	46.44	7.86	35.50	38.30	41.00	45.00	50.00	57.20	65.20
156	452	47.91	8.68	36.50	39.10	42.10	46.00	51.50	59.80	69.70
157	437	49.11	9.11	37.60	39.20	43.00	46.50	53.50	62.40	69.10
158	476	50.00	9.10	37.60	40.10	43.60	48.00	55.00	63.00	71.00
159	398	51.34	9.40	39.00	42.00	45.20	49.00	55.50	64.50	76.40
160	454	51.44	9.49	39.10	42.50	45.00	49.00	55.00	64.50	75.40
161	403	53.47	9.83	39.50	42.50	46.40	51.80	58.50	68.50	75.20
162	406	53.27	9.05	40.60	44.00	47.00	52.00	57.00	63.50	75.20
163	442	54.78	9.38	43.00	45.00	48.20	53.00	58.50	66.00	78.70
164	402	55.63	9.27	43.00	46.00	49.00	54.00	60.00	68.50	78.90
165	429	55.63	8.80	43.60	46.20	49.80	54.00	60.00	67.20	78.00
166	362	57.18	9.46	45.00	46.70	50.90	55.70	61.40	68.00	82.20
167	412	58.63	9.48	45.80	48.70	52.00	57.00	63.00	70.00	82.20
168	489	59.14	9.84	47.20	49.30	52.20	57.00	63.00	74.00	85.00
169	481	60.55	10.06	47.20	51.00	54.00	58.00	64.00	75.50	84.20
170	441	60.45	8.99	48.00	51.40	55.00	59.00	64.50	71.00	82.20
171	443	63.17	10.98	50.20	52.00	55.50	60.70	68.00	78.70	94.80
172	442	64.56	11.58	51.40	53.80	56.50	62.00	69.00	80.10	98.00
173	461	64.44	11.45	50.50	54.00	57.00	61.50	68.00	80.50	90.00
174	402	64.43	10.84	50.60	54.00	57.80	62.30	68.10	77.50	88.50
175	413	66.47	9.42	54.00	56.40	60.00	64.50	70.50	80.00	88.20
176	313	64.89	8.48	52.10	55.50	58.70	63.80	69.50	75.00	86.00
177	316	66.71	9.77	52.20	56.80	60.50	64.80	70.60	79.80	89.00
178	329	68.08	9.16	54.00	58.00	62.00	66.50	72.90	80.10	88.00
179	235	69.51	9.93	55.20	59.50	63.00	68.00	73.00	81.00	95.90
180	227	71.01	10.40	56.00	59.50	64.70	69.00	75.00	85.00	98.00
181	191	70.20	9.09	56.90	60.10	65.00	68.20	74.40	81.10	94.50
182	147	71.44	11.17	58.00	61.00	64.20	69.50	76.00	84.10	98.30
183	132	73.18	10.87	58.50	62.00	65.00	71.00	78.50	92.50	96.80
184	101	74.68	12.85	58.00	60.50	65.00	70.80	81.50	95.20	105.20

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.6

Change of weight-for-height/length mean and percentiles from birth to the age of 18 years (girls)

Body height/ length) (cm)	Case number (N)	Mean \bar{x} (kg)	SD	Percentiles (kg)						
				3	10	25	50	75	90	97
47	237	2.83	0.25	2.50	2.55	2.65	2.80	2.95	3.14	3.35
48	409	2.97	0.28	2.53	2.62	2.79	2.95	3.12	3.30	3.60
49	592	3.13	0.34	2.60	2.75	2.92	3.10	3.30	3.50	3.77
50	696	3.32	0.30	2.78	2.92	3.12	3.30	3.50	3.70	3.90
51	784	3.49	0.33	2.86	3.10	3.27	3.48	3.70	3.93	4.15
52	814	3.73	0.41	3.00	3.25	3.48	3.70	3.97	4.20	4.50
53	834	3.95	0.45	3.10	3.45	3.70	3.95	4.18	4.47	4.82
54	868	4.18	0.46	3.39	3.65	3.90	4.15	4.45	4.75	5.10
55	814	4.42	0.48	3.45	3.85	4.12	4.42	4.70	5.00	5.25
56	880	4.71	0.51	3.85	4.10	4.35	4.65	5.00	5.31	5.70
57	837	4.89	0.50	3.95	4.30	4.55	4.90	5.20	5.51	5.85
58	901	5.19	0.54	4.35	4.60	4.85	5.10	5.50	5.87	6.35
59	949	5.46	0.51	4.62	4.85	5.10	5.41	5.75	6.10	6.45
60	998	5.72	0.60	4.80	5.10	5.35	5.65	6.02	6.43	6.85
61	978	5.94	0.58	5.00	5.30	5.56	5.90	6.25	6.69	7.08
62	1037	6.21	0.57	5.25	5.52	5.85	6.15	6.50	6.95	7.45
63	1087	6.45	0.56	5.52	5.80	6.05	6.40	6.80	7.20	7.60
64	1120	6.71	0.59	5.75	6.00	6.30	6.65	7.05	7.51	7.95
65	1085	6.95	0.62	5.90	6.23	6.55	6.90	7.30	7.71	8.30
66	1053	7.19	0.62	6.15	6.44	6.80	7.15	7.55	8.00	8.45
67	962	7.43	0.68	6.30	6.60	6.98	7.35	7.88	8.36	8.79
68	1006	7.68	0.68	6.55	6.85	7.20	7.65	8.06	8.60	9.10
69	997	8.02	0.71	6.80	7.15	7.50	8.00	8.50	8.95	9.50
70	942	8.27	0.73	7.00	7.35	7.75	8.25	8.75	9.20	9.80
71	845	8.47	0.74	7.22	7.55	8.00	8.44	9.00	9.45	9.93
72	960	8.77	0.76	7.45	7.88	8.24	8.70	9.22	9.80	10.25
73	893	9.03	0.76	7.70	8.10	8.50	9.00	9.50	10.00	10.50
74	866	9.26	0.82	7.90	8.25	8.70	9.20	9.80	10.30	11.00
75	820	9.50	0.83	8.10	8.50	9.00	9.40	10.00	10.50	11.25
76	835	9.72	0.89	8.25	8.60	9.10	9.60	10.20	10.80	11.65
77	677	9.98	0.86	8.50	9.00	9.30	9.90	10.50	11.10	11.89
78	822	10.19	0.93	8.70	9.10	9.60	10.10	10.70	11.40	12.20
79	756	10.43	0.92	8.90	9.30	9.80	10.30	11.00	11.70	12.30
80	761	10.63	0.96	9.00	9.50	10.00	10.60	11.20	11.90	12.60
81	679	10.77	0.98	9.10	9.60	10.10	10.70	11.30	12.00	12.80
82	734	11.01	0.94	9.50	10.00	10.40	11.00	11.50	12.10	13.00
83	707	11.30	0.99	9.70	10.10	10.60	11.20	12.00	12.60	13.50
84	714	11.50	1.00	10.00	10.30	10.80	11.40	12.00	12.80	13.50
85	671	11.72	1.04	10.00	10.50	11.00	11.60	12.30	13.00	13.80
86	582	11.92	1.00	10.20	10.70	11.20	12.00	12.50	13.10	13.90
87	538	12.14	1.08	10.40	10.90	11.50	12.00	12.80	13.50	14.10
88	410	12.53	1.06	10.70	11.30	11.80	12.50	13.10	14.00	14.60
89	363	12.77	1.27	10.80	11.30	12.00	12.70	13.50	14.40	15.00
90	304	12.95	1.18	11.00	11.50	12.00	13.00	13.80	14.50	15.10
91	263	13.27	1.24	11.00	12.00	12.50	13.10	14.00	14.80	16.00
92	248	13.44	1.25	11.10	12.00	12.50	13.50	14.20	15.00	16.00

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.6

Change of weight-for-height/length mean and percentiles from birth to the age of 18 years (girls) (Continuation)

Body height/ length) (cm)	Case number (N)	Mean \bar{x} (kg)	SD	Percentiles (kg)						
				3	10	25	50	75	90	97
93	256	13.75	1.16	11.70	12.20	13.00	13.70	14.50	15.20	16.00
94	293	14.02	1.55	11.80	12.40	13.00	14.00	14.90	15.50	17.00
95	309	14.21	1.27	12.00	12.60	13.50	14.10	15.00	16.00	16.70
96	287	14.61	1.40	12.10	13.00	13.50	14.50	15.50	16.40	17.50
97	287	14.84	1.37	12.50	13.20	14.00	14.80	15.50	16.80	17.70
98	313	15.04	1.37	12.80	13.50	14.10	15.00	15.80	16.70	17.50
99	275	15.25	1.44	13.00	13.50	14.30	15.00	16.00	17.20	18.00
100	292	15.67	1.49	13.30	14.00	14.60	15.50	16.50	17.50	18.50
101	327	15.80	1.41	13.00	14.20	15.00	15.60	16.70	17.50	18.80
102	360	16.11	1.47	14.00	14.50	15.00	16.00	17.00	18.00	19.00
103	328	16.59	1.67	13.80	14.80	15.50	16.50	17.50	18.60	20.20
104	314	16.85	1.54	14.50	15.00	15.90	16.80	17.80	18.60	20.10
105	323	17.08	1.57	14.50	15.40	16.00	17.00	18.00	19.00	20.50
106	309	17.29	1.73	14.60	15.00	16.00	17.00	18.50	19.50	21.00
107	330	17.60	1.85	15.00	15.50	16.20	17.50	18.80	20.00	22.00
108	333	18.12	1.90	15.00	16.00	17.00	18.00	19.10	20.50	22.10
109	349	18.40	1.98	15.80	16.20	17.00	18.00	19.40	20.80	23.00
110	370	18.77	1.92	16.00	16.70	17.50	18.50	19.50	21.00	23.50
111	299	18.99	2.31	16.00	16.80	17.50	18.60	20.00	21.50	24.00
112	343	19.45	2.03	16.00	17.00	18.00	19.30	20.50	22.00	24.00
113	333	19.63	2.11	16.30	17.40	18.30	19.50	20.50	22.20	24.20
114	323	20.25	2.47	16.90	17.80	18.60	20.00	21.50	23.00	25.00
115	371	20.74	2.49	17.30	18.00	19.00	20.20	22.00	23.40	27.30
116	336	20.86	2.29	17.30	18.00	19.20	20.50	22.00	24.00	26.00
117	337	21.50	2.79	18.00	18.80	19.70	21.00	22.80	25.00	28.00
118	340	21.72	2.48	18.00	19.20	20.00	21.40	22.90	25.00	26.60
119	354	22.08	2.64	18.50	19.20	20.00	21.90	23.50	25.70	28.50
120	378	22.55	2.47	19.00	19.80	21.00	22.20	24.00	26.00	27.50
121	348	23.26	2.98	19.30	20.20	21.30	22.80	24.50	27.00	29.60
122	385	23.66	2.74	19.50	20.50	22.00	23.00	25.00	27.20	30.00
123	360	24.11	3.52	20.00	20.50	22.00	23.50	25.30	28.10	32.50
124	336	24.65	3.27	20.00	21.10	22.50	24.00	26.20	28.80	31.50
125	389	25.25	3.58	20.40	21.70	23.00	24.50	27.00	30.00	33.30
126	379	25.28	3.19	21.00	22.00	23.00	24.70	27.00	29.50	32.60
127	371	26.08	3.38	21.00	22.50	24.00	25.50	28.00	30.50	33.90
128	382	26.54	3.51	22.00	23.00	24.20	26.00	28.30	31.00	33.00
129	406	27.06	3.54	22.00	23.50	24.60	26.30	28.70	32.00	36.00
130	394	28.07	4.09	22.50	24.00	25.20	27.00	29.90	33.50	39.00
131	386	28.12	3.99	22.50	24.00	25.30	27.50	30.00	33.00	38.50
132	387	29.15	4.73	23.10	25.00	26.00	28.00	31.00	35.00	40.00
133	366	29.20	3.84	23.70	25.00	26.30	28.80	31.10	34.90	38.00
134	415	29.69	4.21	24.30	25.10	27.00	28.90	32.00	35.00	40.00
135	439	31.06	4.49	25.20	26.50	28.00	30.00	33.00	37.00	42.00
136	404	31.85	5.18	25.00	26.50	28.20	30.70	34.50	39.50	44.10
137	417	31.75	4.93	25.20	27.00	28.50	30.90	34.00	38.00	43.00
138	438	32.52	4.83	26.00	27.00	29.00	31.50	35.00	38.50	44.00

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.6

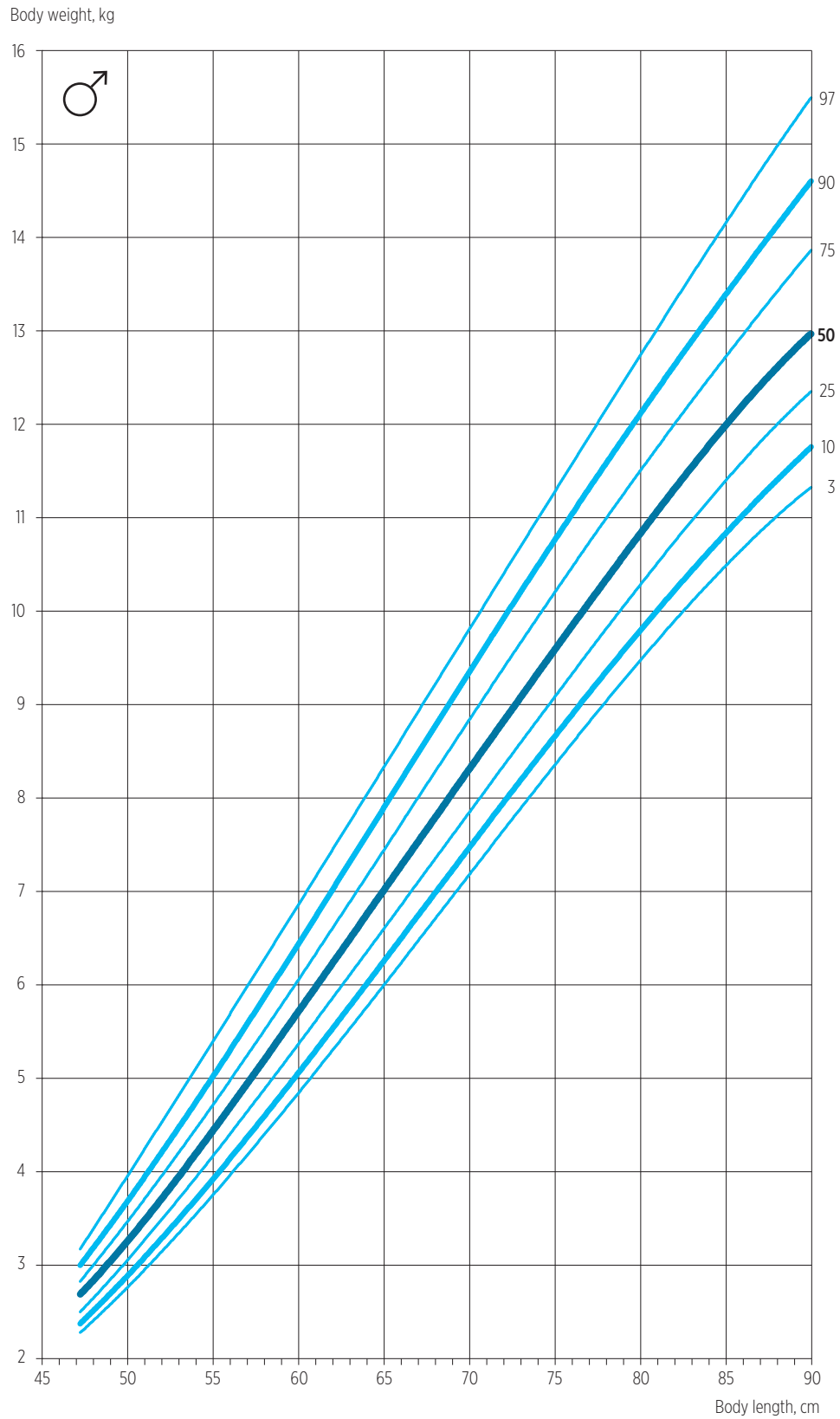
Change of weight-for-height/length mean and percentiles from birth to the age of 18 years (girls) (Continuation)

Body height/ length) (cm)	Case number (N)	Mean \bar{x} (kg)	SD	Percentiles (kg)						
				3	10	25	50	75	90	97
139	433	33.28	5.26	26.50	27.80	30.00	32.10	35.50	40.00	46.30
140	476	33.94	4.81	27.00	29.00	30.50	33.00	36.50	40.20	45.30
141	432	34.71	5.71	28.00	29.00	31.00	33.10	37.50	42.00	47.50
142	475	35.92	5.70	28.00	30.00	32.00	34.80	38.50	44.00	50.50
143	447	36.25	5.91	28.50	30.00	32.20	34.50	39.30	44.00	49.80
144	446	37.20	6.34	28.70	31.00	33.00	35.80	40.40	45.30	51.60
145	485	38.13	6.25	29.50	31.50	33.80	37.00	41.30	46.20	53.90
146	448	38.80	6.51	30.00	32.00	34.20	37.50	41.80	47.50	55.40
147	495	40.03	6.69	31.10	33.00	35.30	38.50	43.50	48.90	55.00
148	486	40.46	7.47	31.20	33.50	35.50	38.60	44.00	49.00	58.30
149	482	41.01	6.97	31.00	33.50	36.20	40.00	44.90	49.60	55.50
150	547	43.05	7.17	32.70	35.00	38.00	41.50	47.50	53.50	58.20
151	489	44.14	8.05	33.50	36.00	38.50	42.50	48.50	54.30	63.50
152	575	45.62	8.61	34.00	36.40	39.70	43.80	50.10	57.00	65.00
153	599	46.05	7.76	34.90	37.70	40.30	45.00	49.50	57.50	64.20
154	589	47.16	8.15	35.00	38.10	41.60	45.70	51.30	58.50	65.60
155	648	48.82	8.63	36.50	39.20	42.10	47.00	54.00	62.10	66.50
156	663	50.41	9.44	37.50	40.30	43.70	48.80	54.80	64.20	73.00
157	655	50.47	8.04	38.10	41.80	45.00	49.00	54.30	61.00	68.50
158	846	51.60	8.31	39.00	42.00	46.00	50.30	56.20	62.30	70.30
159	694	52.04	8.82	40.00	42.60	46.00	50.10	56.00	65.00	74.00
160	780	53.00	8.48	41.00	43.50	47.30	51.40	57.00	65.10	72.60
161	661	53.40	8.50	41.10	44.20	48.00	51.80	57.00	66.00	73.90
162	717	54.93	8.85	43.00	45.30	49.00	53.50	59.00	66.00	76.50
163	767	55.29	8.14	43.80	46.80	50.00	54.10	58.50	66.00	75.50
164	690	55.76	8.05	43.50	47.00	50.90	54.50	59.00	65.60	75.70
165	686	56.30	7.64	45.00	47.50	51.50	55.30	60.00	65.20	73.90
166	494	57.36	9.33	45.60	48.00	51.10	55.00	62.00	68.50	80.40
167	545	58.44	8.67	46.00	49.50	53.00	56.50	62.40	70.00	76.20
168	504	59.80	8.18	48.00	51.50	54.90	58.00	63.00	70.00	82.00
169	415	59.74	7.51	48.20	51.60	55.00	59.00	63.20	67.80	80.00
170	386	60.79	8.08	49.00	52.00	55.50	60.00	64.50	72.00	80.00
171	244	61.77	8.49	50.00	53.00	56.00	60.00	65.00	73.10	85.00
172	231	63.18	10.08	51.00	53.50	56.00	60.00	67.70	78.00	88.00
173	174	63.77	11.06	50.00	53.50	57.00	61.20	66.80	75.00	96.00
174	119	63.83	11.63	52.50	54.10	56.50	62.00	66.00	75.10	92.50
175	108	65.13	11.39	50.00	55.30	57.40	63.00	70.00	78.00	90.00

Based on the reference data of the Hungarian Longitudinal Growth Study.

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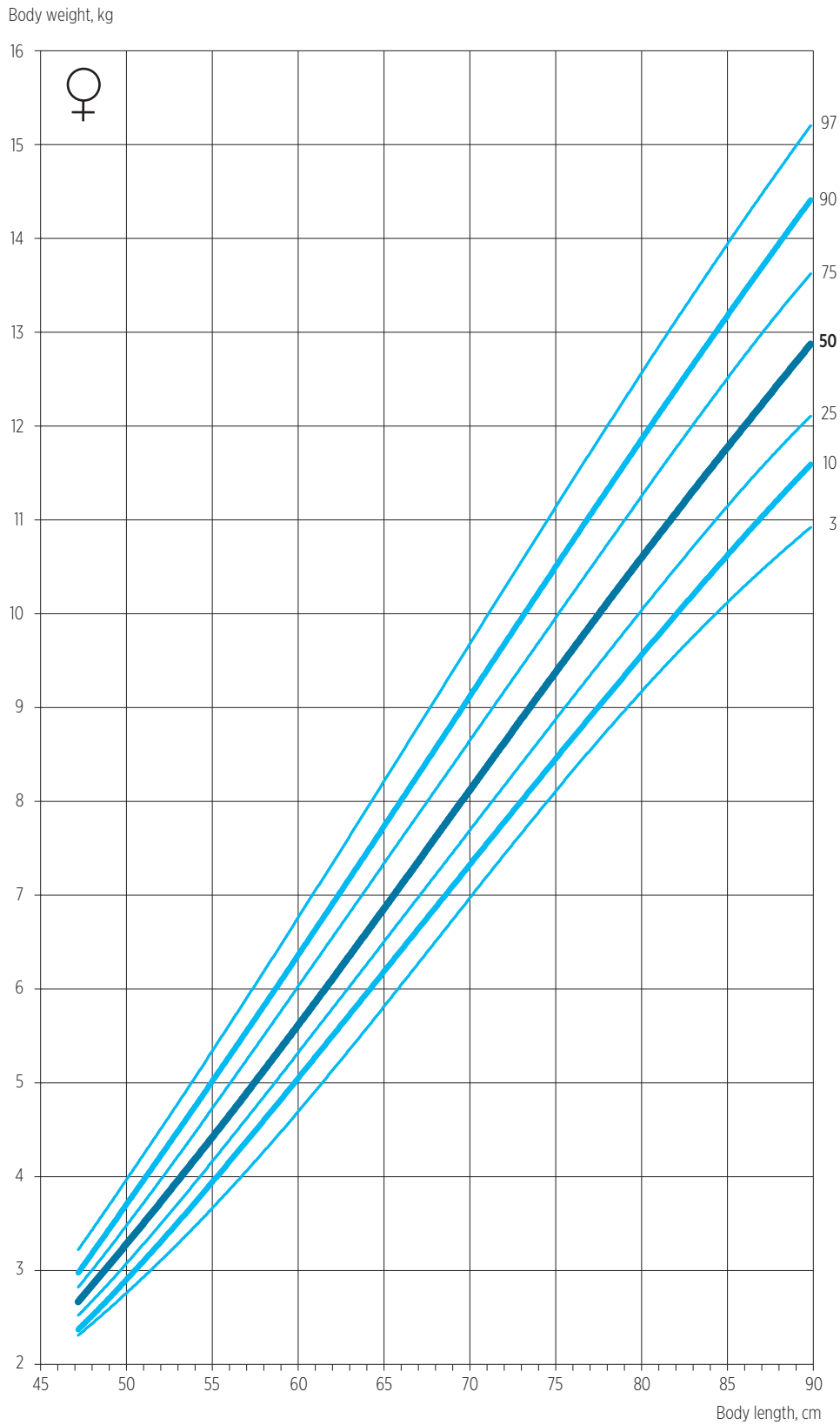
Based on the reference data of the Hungarian Longitudinal Growth Study.

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Figure 3.9

Percentiles of weight-for-length from birth to the age of 2 years (boys)



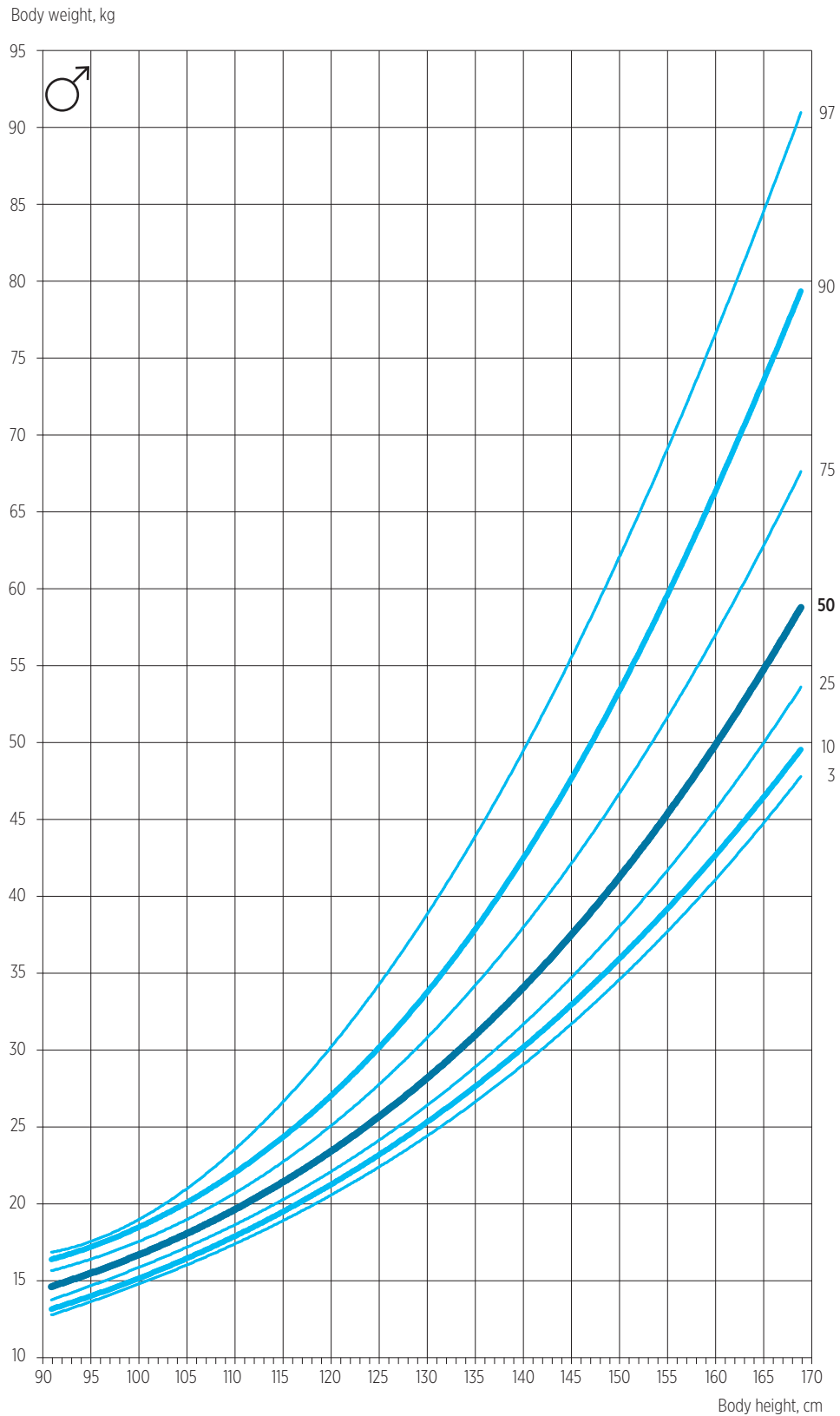
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Figure 3.10

Percentiles of weight-for-length from birth to the age of 2 years (girls)



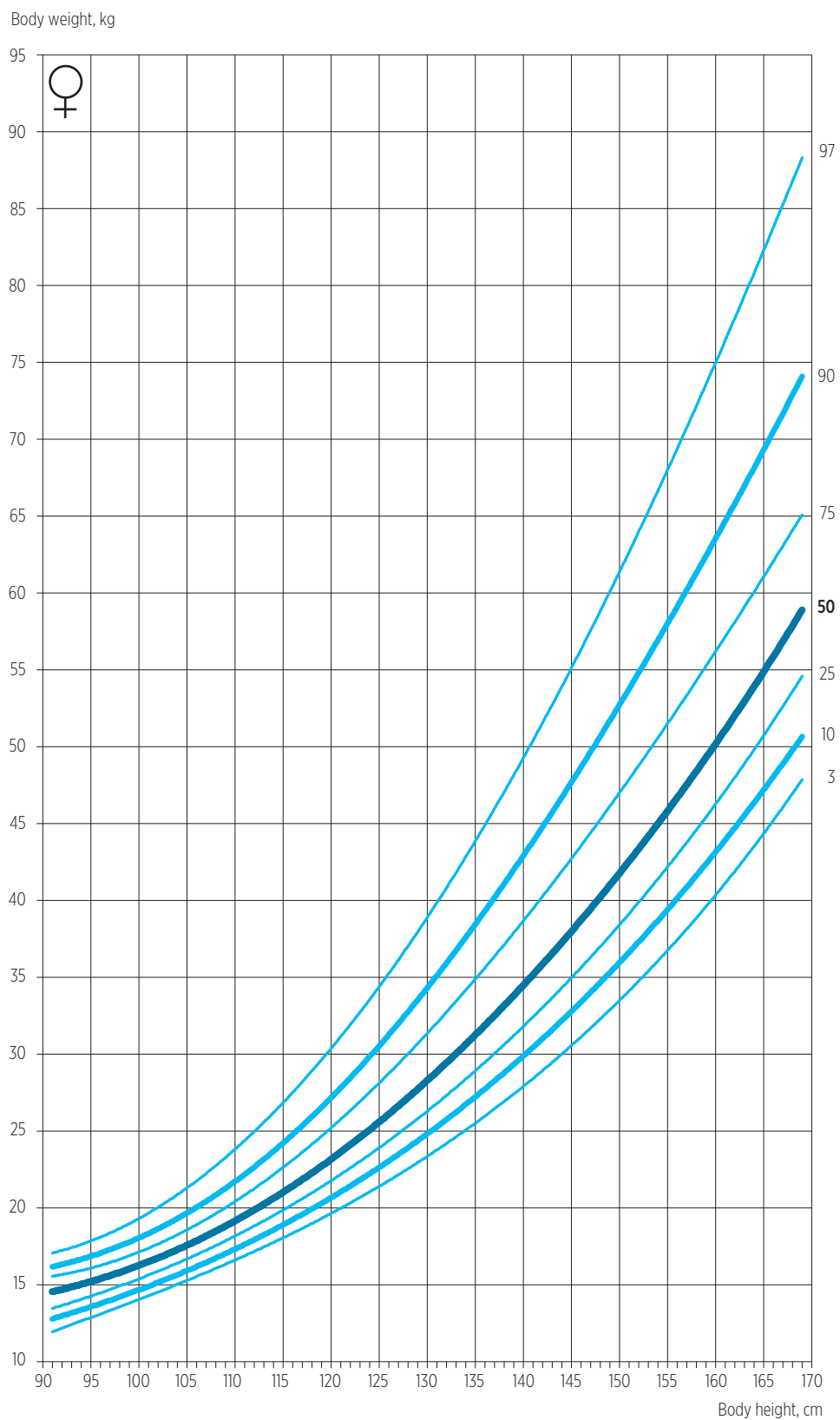
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Figure 3.11

Percentiles of weight-for-height from the age of 2 to 14 years (boys) Percentiles of weight-for-length from birth to the age of 2 years (girls)



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Figure 3.12

Percentiles of weight-for-height from the age of 2 to 14 years (girls) birth to the age of 2 years (girls)

Table 3.7

Change of body mass index (BMI) reference mean and percentiles from birth to the age of 18 years (boys)

Age	Case number (N)	Mean \bar{x} (kg/m ²)	SD	Percentiles (kg/m ²)							
				3	10	25	50	75	85	90	97
At birth	2 984	12.80	1.22	10.73	11.34	12.02	12.77	13.54	13.98	14.30	15.03
1 month	2 949	13.95	1.22	11.75	12.43	13.12	13.89	14.73	15.18	15.51	16.40
2 months	2 938	15.29	1.32	12.93	13.67	14.44	15.25	16.10	16.62	16.96	17.80
3 months	2 927	16.04	1.41	13.63	14.33	15.10	15.96	16.90	17.45	17.84	18.74
4 months	2 895	16.50	1.45	14.04	14.78	15.55	16.40	17.37	17.93	18.36	19.42
5 months	2 869	16.71	1.46	14.20	14.95	15.72	16.64	17.65	18.15	18.56	19.56
6 months	2 838	16.85	1.48	14.29	15.09	15.84	16.80	17.76	18.29	18.66	19.73
8 months	2 809	17.13	1.51	14.56	15.24	16.09	17.07	18.06	18.65	19.02	20.08
10 months	2 789	17.24	1.50	14.69	15.39	16.21	17.17	18.17	18.73	19.14	20.16
12 months	2 807	17.19	1.49	14.64	15.40	16.17	17.07	18.11	18.73	19.13	20.27
15 months	2 622	16.97	1.48	14.51	15.19	15.95	16.83	17.83	18.48	18.91	20.01
18 months	2 597	16.78	1.48	14.30	15.05	15.77	16.69	17.64	18.28	18.66	19.84
21 months	2 543	16.57	1.48	14.06	14.84	15.58	16.45	17.45	18.04	18.49	19.56
2 years	2 585	16.35	1.48	13.88	14.64	15.37	16.18	17.21	17.79	18.25	19.40
3 years	2 351	15.93	1.44	13.51	14.30	15.00	15.82	16.72	17.27	17.62	18.93
4 years	2 397	15.67	1.48	13.26	13.99	14.71	15.55	16.46	17.00	17.46	18.82
5 years	2 455	15.56	1.58	13.08	13.83	14.54	15.39	16.32	16.94	17.42	18.89
6 years	2 469	15.66	1.80	13.12	13.77	14.52	15.38	16.48	17.13	17.67	19.62
7 years	2 335	15.91	1.99	13.17	13.88	14.62	15.56	16.67	17.59	18.27	20.66
8 years	2 306	16.37	2.29	13.44	14.16	14.93	15.91	17.19	18.33	19.12	21.96
9 years	2 274	16.89	2.61	13.65	14.37	15.25	16.32	17.71	19.14	20.20	23.81
10 years	2 222	17.50	2.96	13.85	14.65	15.58	16.78	18.60	20.47	21.40	25.33
10.5 years	1 689	17.83	3.16	13.97	14.85	15.72	17.00	19.08	20.93	22.05	26.35
11 years	1 794	18.17	3.32	14.20	14.94	15.94	17.30	19.59	21.36	22.61	26.66
11.5 years	1 662	18.54	3.48	14.30	15.16	16.17	17.59	20.16	21.77	23.43	27.32
12 years	1 749	18.85	3.57	14.40	15.34	16.36	17.83	20.48	22.14	23.89	27.86
12.5 years	1 601	19.22	3.62	14.66	15.69	16.70	18.29	20.89	22.48	24.18	28.34
13 years	1 687	19.52	3.58	14.95	15.83	17.06	18.68	21.00	22.80	24.51	28.45
13.5 years	1 549	19.79	3.54	15.19	16.28	17.43	18.92	21.28	23.08	24.61	28.92
14 years	1 611	20.00	3.51	15.34	16.50	17.66	19.23	21.42	23.33	24.62	29.06
14.5 years	1 166	20.28	3.37	15.81	16.82	18.02	19.58	21.57	23.56	24.72	29.06
15 years	1 188	20.52	3.36	16.08	17.15	18.35	19.76	21.92	23.75	24.76	29.09
15.5 years	837	20.75	3.27	16.45	17.60	18.59	20.13	21.93	23.92	24.88	28.84
16 years	890	20.99	3.18	16.81	17.85	18.95	20.33	22.30	24.05	24.86	28.63
16.5 years	654	21.35	3.30	17.11	18.01	19.15	20.71	22.53	24.16	25.39	29.39
17 years	692	21.57	3.24	17.28	18.29	19.38	20.97	22.81	24.23	25.87	29.37
17.5 years	485	21.76	3.01	17.64	18.45	19.70	21.22	23.11	24.28	26.02	29.01
18 years	516	21.90	3.11	17.66	18.45	19.88	21.41	23.12	24.29	26.26	29.24

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.8

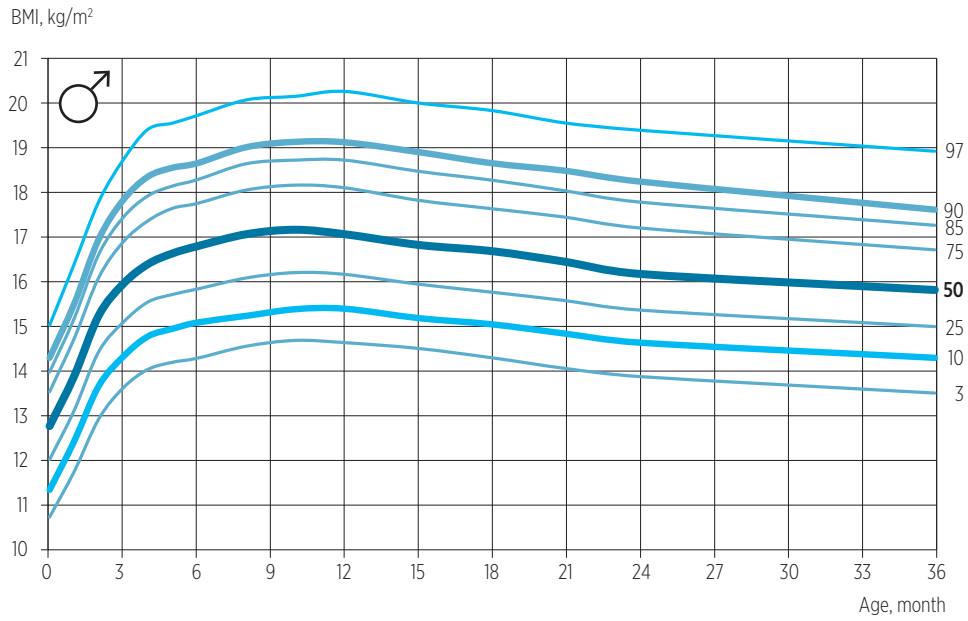
Change of body mass index (BMI) reference mean and percentiles from birth to the age of 18 years (girls)

Age	Case number (N)	Mean \bar{x} (kg/m ²)	SD	Percentiles (kg/m ²)							
				3	10	25	50	75	85	90	97
At birth	2 701	12.71	1.15	10.67	11.27	11.93	12.67	13.45	13.90	14.23	14.97
1 month	2 661	13.69	1.15	11.57	12.28	12.90	13.67	14.43	14.85	15.19	15.92
2 months	2 653	14.83	1.21	12.68	13.37	13.98	14.77	15.60	16.08	16.47	17.24
3 months	2 622	15.52	1.34	13.26	13.91	14.62	15.41	16.35	16.88	17.23	18.19
4 months	2 602	16.00	1.37	13.73	14.39	15.08	15.87	16.82	17.35	17.77	18.72
5 months	2 577	16.26	1.42	13.92	14.59	15.31	16.12	17.09	17.68	18.10	19.19
6 months	2 543	16.43	1.45	14.05	14.70	15.44	16.29	17.29	17.92	18.37	19.34
8 months	2 519	16.72	1.47	14.26	14.95	15.73	16.62	17.63	18.24	18.63	19.69
10 months	2 480	16.88	1.48	14.31	15.12	15.89	16.79	17.80	18.37	18.73	19.89
12 months	2 495	16.84	1.50	14.32	15.05	15.83	16.73	17.73	18.30	18.73	19.94
15 months	2 325	16.64	1.48	14.23	14.88	15.63	16.51	17.48	18.12	18.55	19.76
18 months	2 292	16.47	1.50	14.06	14.71	15.46	16.35	17.31	17.96	18.40	19.52
21 months	2 261	16.26	1.49	13.85	14.53	15.22	16.12	17.11	17.74	18.12	19.31
2 years	2 303	16.09	1.48	13.71	14.31	15.10	15.99	16.94	17.51	17.95	19.12
3 years	2 094	15.71	1.50	13.28	14.00	14.77	15.61	16.57	17.15	17.54	18.80
4 years	2 127	15.54	1.56	13.10	13.81	14.51	15.39	16.40	16.94	17.42	18.72
5 years	2 206	15.44	1.68	13.01	13.61	14.32	15.26	16.28	16.94	17.39	19.17
6 years	2 209	15.55	1.88	12.88	13.61	14.32	15.25	16.42	17.16	17.88	19.74
7 years	2 102	15.75	2.08	12.91	13.62	14.41	15.38	16.64	17.62	18.34	20.53
8 years	2 077	16.18	2.34	13.18	13.84	14.63	15.68	17.18	18.36	19.24	21.49
9 years	2 071	16.65	2.58	13.34	14.05	14.86	16.07	17.86	19.16	20.02	22.65
10 years	2 022	17.18	2.84	13.49	14.32	15.25	16.52	18.54	19.89	21.08	24.10
10.5 years	1 555	17.47	2.97	13.74	14.54	15.48	16.72	18.74	20.32	21.38	24.76
11 years	1 641	17.87	3.13	13.88	14.75	15.74	17.13	19.24	20.84	22.05	25.40
11.5 years	1 531	18.24	3.26	14.05	14.96	16.03	17.54	19.63	21.36	22.53	26.28
12 years	1 614	18.68	3.29	14.38	15.33	16.42	18.08	20.09	21.74	22.96	26.70
12.5 years	1 494	19.07	3.27	14.65	15.71	16.80	18.42	20.55	22.10	23.31	26.96
13 years	1 586	19.52	3.26	15.05	16.10	17.29	18.91	21.05	22.44	23.89	27.26
13.5 years	1 448	19.89	3.25	15.48	16.59	17.73	19.21	21.34	22.75	24.28	27.77
14 years	1 525	20.22	3.25	15.83	16.80	18.03	19.60	21.62	23.05	24.57	27.70
14.5 years	1 137	20.52	3.22	16.22	17.20	18.39	19.84	21.87	23.33	24.93	28.09
15 years	1 160	20.77	3.32	16.28	17.48	18.66	20.15	22.07	23.58	25.09	28.32
15.5 years	840	21.04	3.15	16.74	17.88	18.93	20.45	22.46	23.81	25.18	28.92
16 years	883	21.09	3.07	16.80	17.98	19.09	20.49	22.50	24.03	25.05	28.77
16.5 years	633	21.25	3.11	16.94	18.04	19.23	20.68	22.45	24.22	25.32	29.25
17 years	691	21.32	3.11	16.98	18.22	19.38	20.61	22.58	24.39	25.06	29.25
17.5 years	465	21.48	3.08	17.31	18.38	19.46	20.82	22.67	24.54	25.58	28.97
18 years	520	21.56	3.05	17.61	18.45	19.54	20.84	22.87	24.67	25.80	29.01

Based on the reference data of the Hungarian Longitudinal Growth Study.

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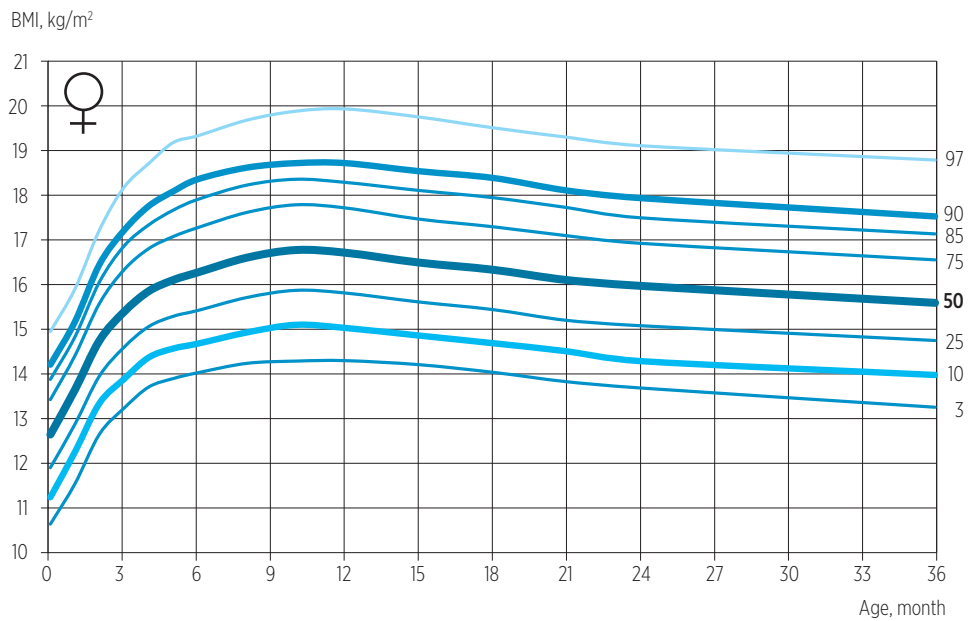
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Figure 3.13

Reference percentiles of body mass index (BMI) from birth to the age of 3 years (boys)



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Figure 3.14

Reference percentiles of body mass index (BMI) from birth to the age of 3 years (girls)

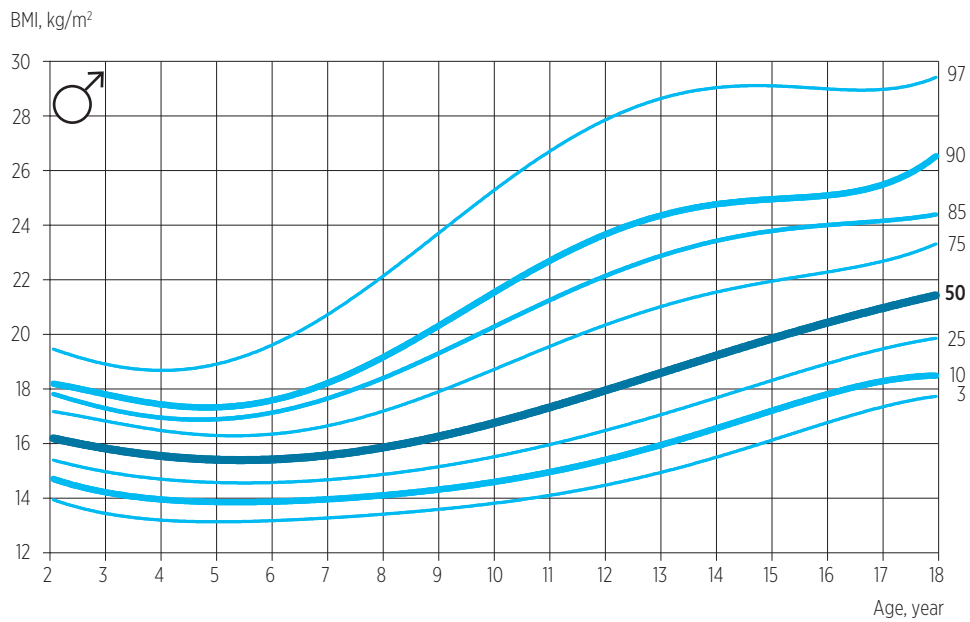


Figure 3.15

Reference percentiles of body mass index (BMI) from the age of 2 to 18 years (boys)

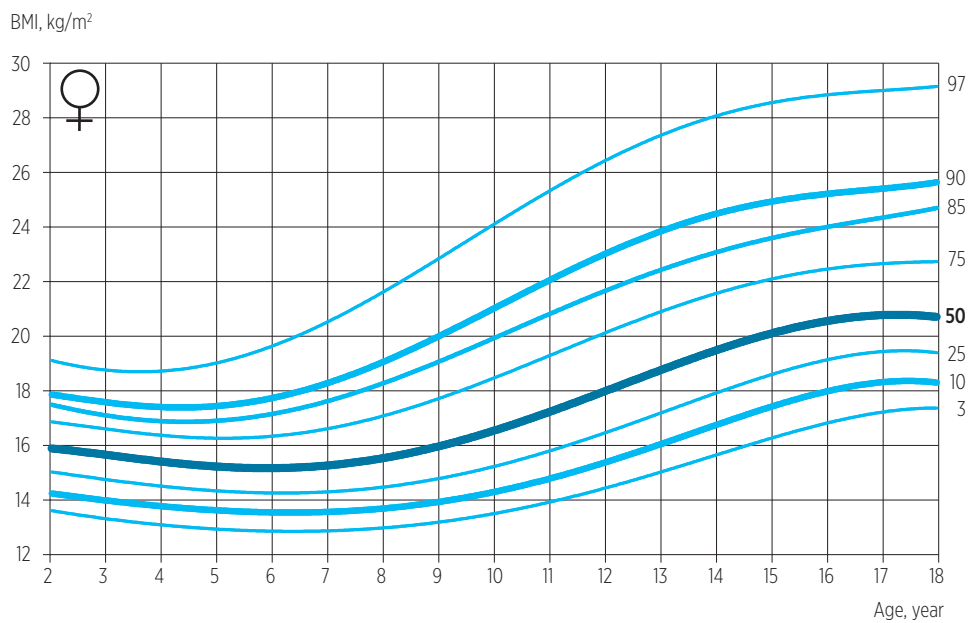


Figure 3.16

Reference percentiles of body mass index (BMI) from the age of 2 to 18 years (girls)

Table 3.9

Reference means and percentiles of head circumference from birth to the age of 18 years (boys)

Age	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (cm)						
				3	10	25	50	75	90	97
At birth	2 986	33.94	1.37	31.10	32.08	33.06	34.02	35.00	35.69	36.54
1 month	2 948	36.12	1.38	33.30	34.24	35.12	36.09	37.05	37.90	38.70
2 months	2 938	37.99	1.37	35.14	36.11	37.06	38.00	38.90	39.60	40.33
3 months	2 928	39.52	1.34	36.85	37.82	38.76	39.55	40.42	41.07	41.89
4 months	2 897	40.76	1.34	38.15	39.14	40.03	40.86	41.69	42.38	43.12
5 months	2 871	41.86	1.35	39.29	40.26	41.09	41.98	42.80	43.51	44.25
6 months	2 840	42.76	1.35	40.15	41.10	41.96	42.84	43.65	44.41	45.18
8 months	2 813	43.93	1.42	41.35	42.29	43.16	44.10	44.95	45.73	46.53
10 months	2 789	44.93	1.39	42.35	43.26	44.14	45.05	45.95	46.70	47.60
12 months	2 800	45.84	1.38	43.17	44.08	44.95	45.84	46.71	47.53	48.40
15 months	2 612	46.67	1.41	44.03	44.92	45.77	46.60	47.56	48.40	49.26
18 months	2 584	47.33	1.42	44.80	45.66	46.50	47.35	48.23	49.11	50.04
21 months	2 529	47.89	1.44	45.42	46.26	47.10	47.93	48.87	49.76	50.58
2 years	2 578	48.41	1.44	45.92	46.70	47.53	48.37	49.28	50.12	50.95
3 years	2 345	49.42	1.37	46.97	47.71	48.53	49.47	50.28	51.07	51.94
4 years	2 383	50.09	1.37	47.60	48.37	49.20	50.11	51.00	51.83	52.60
5 years	2 432	50.71	1.33	48.20	49.03	49.85	50.73	51.58	52.34	53.10
6 years	2 445	51.23	1.30	48.77	49.55	50.40	51.23	52.06	52.83	53.58
7 years	2 315	51.60	1.29	49.22	49.98	50.78	51.56	52.51	53.20	54.03
8 years	2 290	51.99	1.30	49.56	50.36	51.15	51.95	52.91	53.62	54.52
9 years	2 256	52.40	1.32	49.92	50.73	51.54	52.40	53.25	54.05	55.02
10 years	2 203	52.82	1.36	50.30	51.09	51.94	52.81	53.73	54.55	55.55
10.5 years	1 683	53.13	1.43	50.48	51.32	52.08	53.05	54.00	54.86	55.85
11 years	1 788	53.34	1.46	50.72	51.54	52.29	53.29	54.25	55.19	56.17
11.5 years	1 657	53.60	1.48	50.95	51.77	52.55	53.55	54.55	55.49	56.47
12 years	1 745	53.80	1.50	51.15	52.01	52.75	53.77	54.78	55.74	56.75
12.5 years	1 600	54.05	1.50	51.35	52.21	53.00	54.00	55.05	56.00	57.04
13 years	1 682	54.28	1.52	51.54	52.42	53.26	54.25	55.32	56.30	57.32
13.5 years	1 547	54.53	1.52	51.72	52.61	53.47	54.49	55.55	56.50	57.56
14 years	1 608	54.74	1.57	51.85	52.81	53.68	54.72	55.73	56.74	57.82
14.5 years	1 166	54.95	1.61	52.03	52.97	53.92	54.94	55.94	56.95	58.03
15 years	1 189	55.17	1.65	52.20	53.18	54.10	55.13	56.10	57.16	58.20
15.5 years	837	55.37	1.66	52.41	53.37	54.30	55.27	56.28	57.30	58.34
16 years	889	55.53	1.62	52.60	53.58	54.50	55.50	56.44	57.50	58.50
16.5 years	653	55.76	1.64	52.85	53.80	54.72	55.65	56.60	57.68	58.69
17 years	692	55.86	1.63	53.03	54.00	54.88	55.82	56.74	57.84	58.82
17.5 years	485	56.03	1.62	53.30	54.25	55.10	55.96	56.90	58.00	59.00
18 years	516	56.12	1.61	53.52	54.46	55.26	56.10	57.06	58.15	59.10

Based on the reference data of the Hungarian Longitudinal Growth Study.
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Table 3.10

Reference means and percentiles of head circumference from birth to the age of 18 years (girls)

Age	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (cm)						
				3	10	25	50	75	90	97
At birth	2 696	33.43	1.29	31.01	31.81	32.58	33.50	34.24	35.04	35.90
1 month	2 663	35.40	1.31	33.00	33.78	34.54	35.51	36.22	37.04	37.95
2 months	2 654	37.12	1.27	34.55	35.52	36.28	37.07	37.95	38.70	39.48
3 months	2 622	38.54	1.27	36.04	37.00	37.80	38.56	39.38	40.05	40.95
4 months	2 605	39.72	1.27	37.25	38.15	39.02	39.76	40.54	41.23	42.05
5 months	2 579	40.76	1.28	38.36	39.21	40.05	40.81	41.57	42.25	43.10
6 months	2 546	41.67	1.30	39.18	40.00	40.85	41.61	42.42	43.20	44.00
8 months	2 522	42.81	1.34	40.32	41.15	42.04	42.85	43.69	44.54	45.34
10 months	2 483	43.80	1.35	41.28	42.15	43.03	43.85	44.65	45.53	46.35
12 months	2 493	44.71	1.34	42.12	43.02	43.82	44.64	45.50	46.31	47.23
15 months	2 316	45.53	1.35	43.05	43.90	44.69	45.53	46.38	47.21	48.15
18 months	2 284	46.18	1.38	43.66	44.55	45.35	46.15	47.05	47.97	48.96
21 months	2 254	46.74	1.36	44.23	45.05	45.92	46.77	47.63	48.55	49.52
2 years	2 302	47.29	1.38	44.73	45.57	46.39	47.23	48.09	49.04	49.93
3 years	2 090	48.33	1.29	45.97	46.70	47.52	48.28	49.12	50.00	50.81
4 years	2 118	49.05	1.28	46.65	47.52	48.23	49.04	49.93	50.69	51.53
5 years	2 189	49.68	1.29	47.24	48.04	48.93	49.70	50.54	51.28	52.10
6 years	2 193	50.23	1.29	47.80	48.58	49.48	50.21	51.06	51.82	52.56
7 years	2 068	50.66	1.24	48.33	49.06	49.90	50.65	51.51	52.23	53.03
8 years	2 044	51.08	1.26	48.73	49.54	50.30	51.05	51.95	52.69	53.52
9 years	2 040	51.52	1.28	49.12	49.95	50.70	51.54	52.36	53.13	54.02
10 years	1 996	51.97	1.31	49.55	50.40	51.15	52.03	52.85	53.72	54.60
10.5 years	1 542	52.32	1.38	49.75	50.66	51.43	52.30	53.11	54.06	54.96
11 years	1 637	52.62	1.41	50.00	50.95	51.71	52.56	53.45	54.42	55.31
11.5 years	1 531	52.89	1.44	50.23	51.20	51.99	52.88	53.76	54.72	55.60
12 years	1 616	53.17	1.45	50.50	51.47	52.25	53.13	54.05	55.03	55.93
12.5 years	1 494	53.45	1.46	50.78	51.71	52.55	53.39	54.38	55.30	56.17
13 years	1 584	53.69	1.46	51.02	52.00	52.78	53.65	54.65	55.55	56.45
13.5 years	1 447	53.97	1.47	51.22	52.21	53.05	53.90	54.86	55.81	56.72
14 years	1 523	54.15	1.47	51.40	52.38	53.22	54.08	55.05	56.00	56.96
14.5 years	1 139	54.28	1.48	51.60	52.55	53.40	54.23	55.15	56.15	57.14
15 years	1 162	54.48	1.48	51.75	52.70	53.52	54.37	55.29	56.30	57.32
15.5 years	839	54.59	1.47	51.90	52.82	53.65	54.53	55.43	56.40	57.45
16 years	883	54.72	1.47	52.03	52.94	53.82	54.67	55.55	56.50	57.60
16.5 years	630	54.85	1.50	52.15	53.05	53.92	54.80	55.67	56.58	57.75
17 years	691	54.92	1.47	52.30	53.18	54.04	54.93	55.78	56.65	57.87
17.5 years	467	55.08	1.48	52.48	53.35	54.18	55.05	55.85	56.70	57.97
18 years	522	55.17	1.45	52.65	53.50	54.30	55.17	55.95	56.82	58.07

Based on the reference data of the Hungarian Longitudinal Growth Study.
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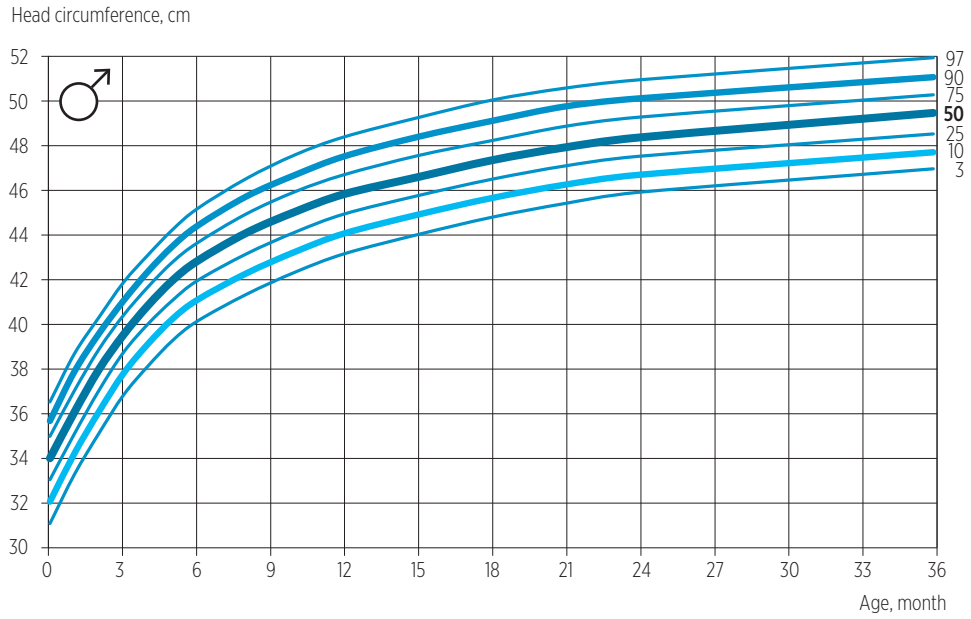


Figure 3.17

Reference percentiles of head circumference from birth to the age of 3 years (boys)

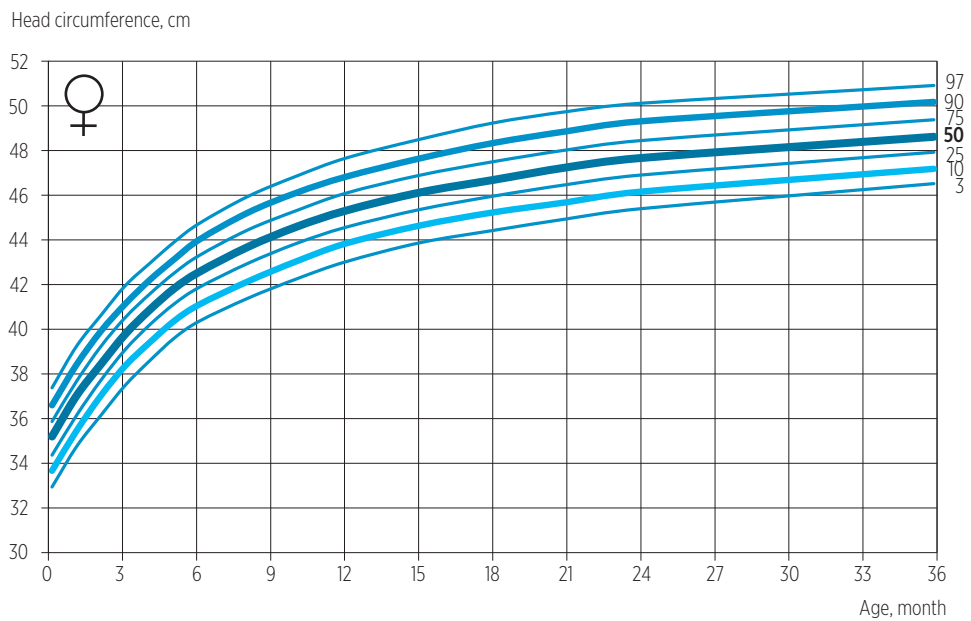


Figure 3.18

Reference percentiles of head circumference from birth to the age of 3 years (girls)

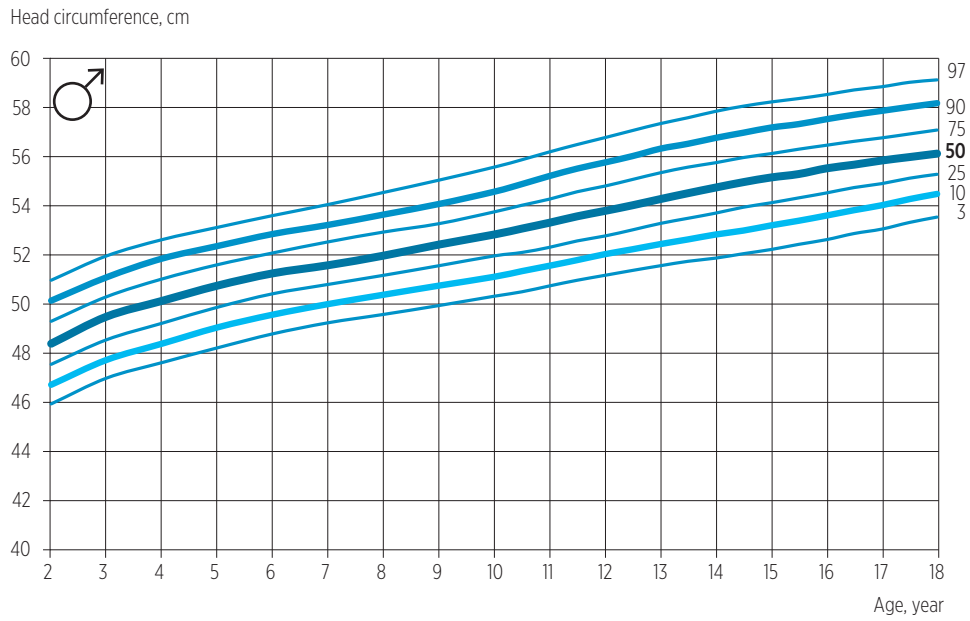


Figure 3.19

Reference percentiles of head circumference from the age of 2 to 18 years (boys)

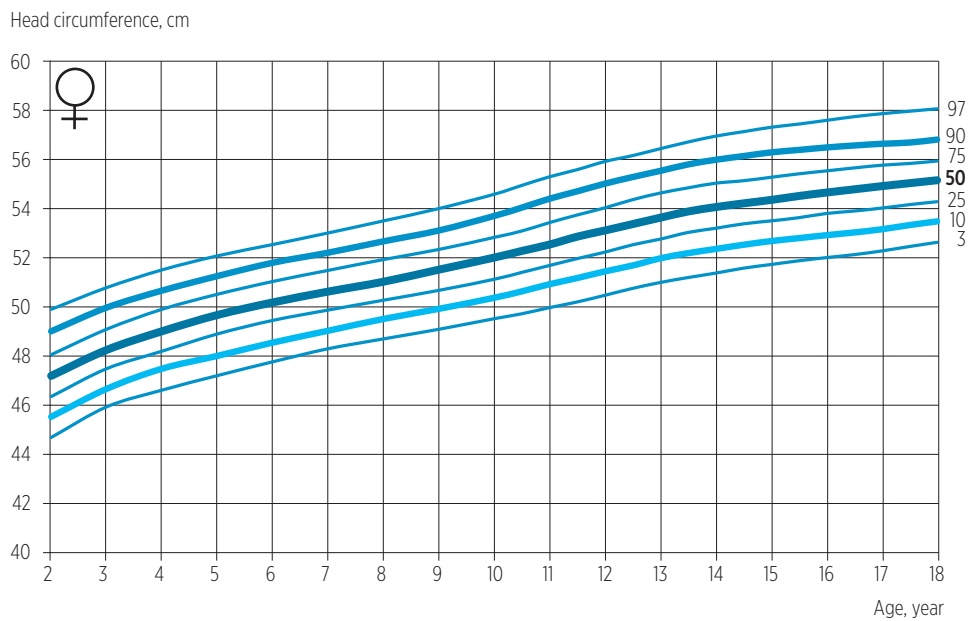


Figure 3.20

Reference percentiles of head circumference from the age of 2 to 18 years (girls)

Table 3.11

Reference means and percentiles of chest circumference from birth to the age of 18 years (boys)

Age	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (cm)						
				3	10	25	50	75	90	97
At birth	2 982	32.14	1.74	29.01	30.01	31.01	32.09	33.25	34.31	35.54
1 month	2 949	34.95	1.84	31.52	32.55	33.75	35.02	36.12	37.22	38.31
2 months	2 939	37.40	1.93	33.77	35.02	36.09	37.43	38.70	39.96	41.03
3 months	2 927	39.35	1.94	35.61	37.01	38.06	39.51	40.56	41.77	43.03
4 months	2 895	40.83	1.98	37.05	38.36	39.58	40.97	42.06	43.22	44.55
5 months	2 873	42.07	2.03	38.30	39.57	40.80	42.06	43.40	44.57	46.02
6 months	2 841	43.14	2.05	39.36	40.56	41.80	43.06	44.47	45.70	47.08
8 months	2 812	44.53	2.18	40.76	42.02	43.14	44.51	45.97	47.28	48.82
10 months	2 790	45.81	2.17	42.02	43.18	44.38	45.78	47.15	48.62	50.10
12 months	2 804	46.94	2.17	43.10	44.24	45.40	46.82	48.18	49.80	51.19
15 months	2 612	47.99	2.15	44.29	45.38	46.50	47.95	49.35	51.01	52.28
18 months	2 583	48.86	2.19	45.14	46.20	47.35	48.78	50.26	52.00	53.30
21 months	2 528	49.67	2.27	45.92	47.00	48.15	49.54	51.10	52.78	54.13
2 years	2 569	50.50	2.33	46.42	47.59	48.80	50.17	51.78	53.50	54.91
3 years	2 346	51.90	2.55	47.90	49.02	50.28	51.76	53.26	55.16	56.95
4 years	2 391	53.52	2.67	49.20	50.42	51.80	53.24	55.04	57.00	58.65
5 years	2 448	55.16	3.01	50.51	51.78	53.15	54.90	56.89	58.76	61.05
6 years	2 460	57.00	3.47	52.02	53.20	54.75	56.59	58.76	61.03	64.47
7 years	2 331	59.25	4.20	53.50	55.01	56.56	58.54	61.06	63.95	68.59
8 years	2 307	61.56	4.90	55.01	56.73	58.52	60.79	63.43	67.11	73.08
9 years	2 272	63.97	5.64	56.54	58.55	60.38	63.00	66.06	70.74	78.05
10 years	2 219	66.52	6.60	58.11	60.23	62.39	65.04	69.03	75.10	83.04
10.5 years	1 695	67.97	6.98	59.02	61.22	63.43	66.20	70.60	77.55	85.64
11 years	1 790	69.35	7.26	60.04	62.22	64.56	67.54	72.26	79.73	87.70
11.5 years	1 655	70.82	7.47	61.03	63.23	65.93	68.97	74.05	81.58	89.70
12 years	1 736	72.22	7.56	62.00	64.49	67.06	70.34	75.67	83.22	91.09
12.5 years	1 589	73.69	7.67	62.88	65.65	68.29	72.03	77.57	85.02	92.35
13 years	1 667	75.35	7.74	64.09	66.94	69.86	73.90	79.54	86.74	93.51
13.5 years	1 525	76.83	7.59	65.30	68.21	71.37	75.56	81.22	88.12	94.95
14 years	1 580	78.64	7.49	66.77	70.00	73.31	77.60	83.15	89.60	96.33
14.5 years	1 161	80.74	8.19	68.07	71.74	75.26	79.61	84.90	91.18	98.00
15 years	1 186	82.30	8.28	69.47	73.24	77.01	81.29	86.23	92.64	99.50
15.5 years	833	83.56	7.70	71.22	74.94	78.56	82.74	87.51	93.76	100.55
16 years	888	84.68	7.49	72.90	76.30	79.84	84.04	88.75	94.77	101.46
16.5 years	655	86.21	7.54	74.30	77.77	81.14	85.08	90.07	95.90	102.30
17 years	692	87.08	7.59	75.62	79.00	82.20	86.02	91.07	96.70	103.20
17.5 years	485	88.00	7.09	77.00	80.03	83.29	86.86	92.08	97.39	103.72
18 years	516	88.53	7.09	77.96	80.71	84.10	87.60	92.65	97.78	104.15

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Table 3.12

Reference means and percentiles of chest circumference from birth to the age of 18 years (girls)

Age	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (cm)						
				3	10	25	50	75	90	97
At birth	2 694	31.88	1.65	28.90	29.81	30.71	31.90	33.03	34.04	35.18
1 month	2 662	34.46	1.70	31.35	32.34	33.26	34.38	35.55	36.73	38.00
2 months	2 653	36.66	1.73	33.45	34.47	35.52	36.59	37.85	39.02	40.09
3 months	2 620	38.43	1.79	35.08	36.11	37.25	38.47	39.62	40.74	41.96
4 months	2 604	39.85	1.86	36.40	37.50	38.71	39.95	41.05	42.21	43.40
5 months	2 577	41.08	1.91	37.58	38.70	39.95	41.10	42.29	43.53	44.70
6 months	2 544	42.16	1.95	38.48	39.65	40.88	42.08	43.35	44.55	45.80
8 months	2 519	43.48	2.01	39.83	41.04	42.32	43.56	44.91	46.04	47.37
10 months	2 481	44.73	2.03	41.05	42.29	43.57	44.75	46.08	47.27	48.67
12 months	2 490	45.82	2.04	42.09	43.27	44.48	45.75	47.04	48.35	49.80
15 months	2 316	46.83	2.07	43.16	44.32	45.55	46.82	48.12	49.54	51.06
18 months	2 283	47.69	2.11	44.06	45.12	46.36	47.65	49.08	50.55	52.08
21 months	2 250	48.48	2.23	44.84	45.92	47.10	48.45	49.88	51.53	53.06
2 years	2 292	49.34	2.30	45.32	46.53	47.74	49.09	50.60	52.25	53.88
3 years	2 085	50.77	2.49	46.69	48.00	49.12	50.56	52.22	54.02	56.02
4 years	2 117	52.39	2.75	47.95	49.27	50.56	52.09	54.02	55.66	58.04
5 years	2 194	54.04	3.13	49.34	50.72	52.05	53.77	55.71	57.75	60.40
6 years	2 199	55.81	3.58	50.55	52.04	53.52	55.23	57.71	60.00	63.65
7 years	2 085	57.86	4.31	51.88	53.33	55.04	57.09	59.89	63.09	67.30
8 years	2 062	60.09	4.95	53.09	54.96	57.01	59.20	62.06	66.51	71.07
9 years	2 058	62.59	5.73	54.70	56.62	58.93	61.51	65.09	70.20	75.95
10 years	2 007	65.37	6.61	56.57	58.55	61.01	64.12	68.58	74.57	81.06
10.5 years	1 560	67.07	6.81	57.62	59.64	62.22	65.64	70.57	76.72	83.12
11 years	1 640	69.14	7.27	58.80	61.09	63.85	67.82	73.12	79.38	85.55
11.5 years	1 526	71.10	7.61	60.02	62.50	65.48	70.03	75.52	81.62	88.07
12 years	1 609	73.37	7.90	61.45	64.06	67.38	72.49	78.07	84.10	90.12
12.5 years	1 489	75.41	7.93	62.90	65.89	69.57	74.62	80.52	86.11	92.14
13 years	1 567	77.50	7.69	64.44	67.95	72.00	77.02	82.53	88.13	93.80
13.5 years	1 429	79.35	7.52	66.28	70.06	74.08	78.94	84.36	89.80	95.45
14 years	1 497	81.21	7.22	68.36	72.20	76.07	80.67	86.08	91.35	97.10
14.5 years	1 138	83.01	8.04	70.28	73.85	77.56	82.14	87.66	92.90	98.78
15 years	1 161	84.21	7.92	72.09	75.25	78.80	83.56	88.73	94.09	100.20
15.5 years	839	85.34	7.72	73.80	76.62	80.06	84.60	89.66	95.07	101.30
16 years	882	86.00	7.58	75.03	77.79	81.05	85.63	90.40	95.92	102.22
16.5 years	633	87.18	7.55	76.00	78.72	81.90	86.61	91.14	96.52	103.16
17 years	691	87.62	7.57	76.65	79.45	82.50	87.33	91.78	97.20	104.07
17.5 years	466	88.32	7.61	77.09	80.05	82.92	87.92	92.44	97.80	104.85
18 years	522	88.74	7.54	77.21	80.20	83.25	88.25	93.00	98.40	105.30

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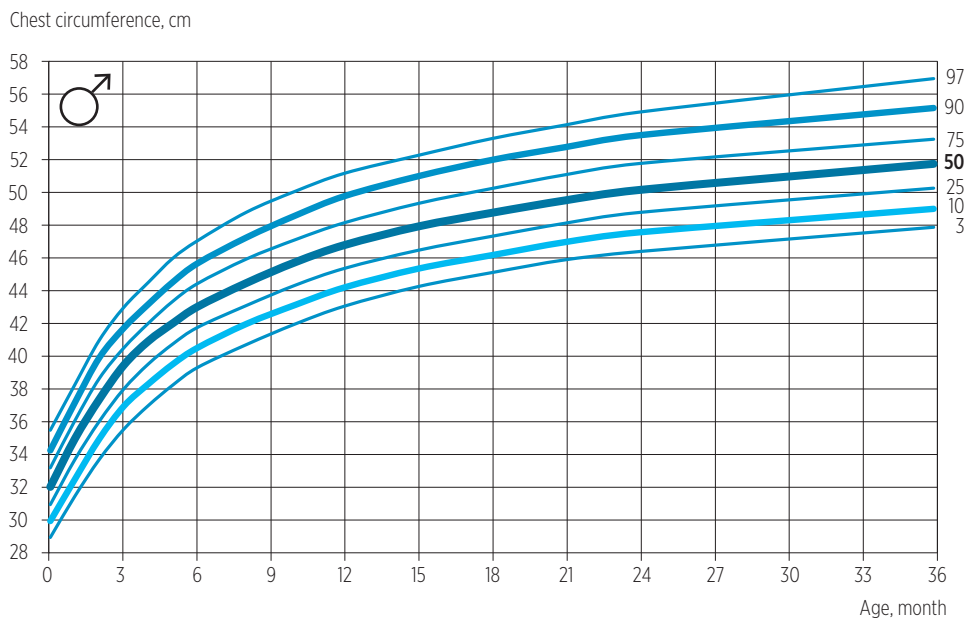


Figure 3.21

Reference percentiles of chest circumference from birth to the age of 3 years (boys)

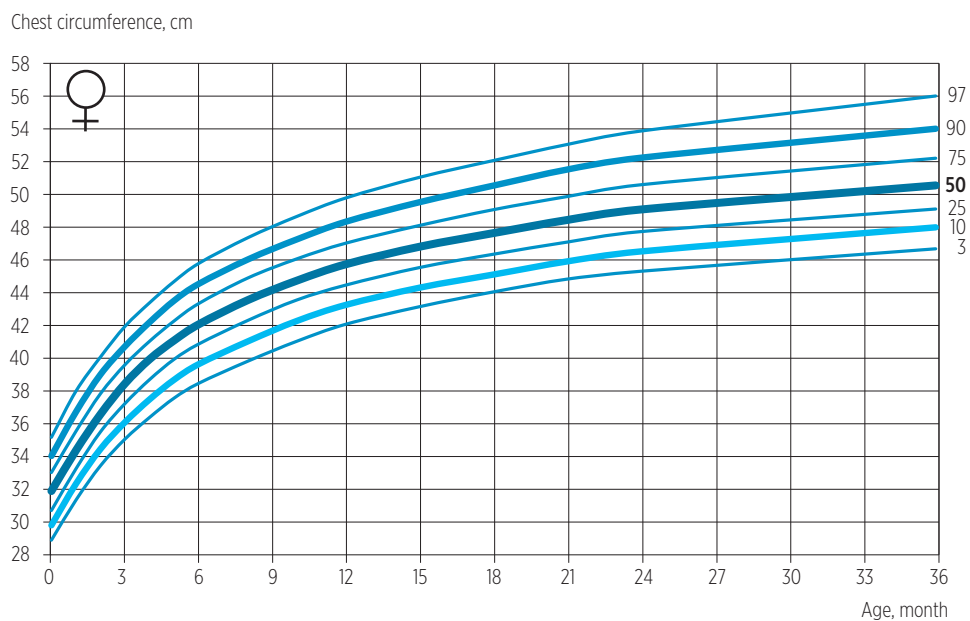


Figure 3.22

Reference percentiles of chest circumference from birth to the age of 3 years (girls)

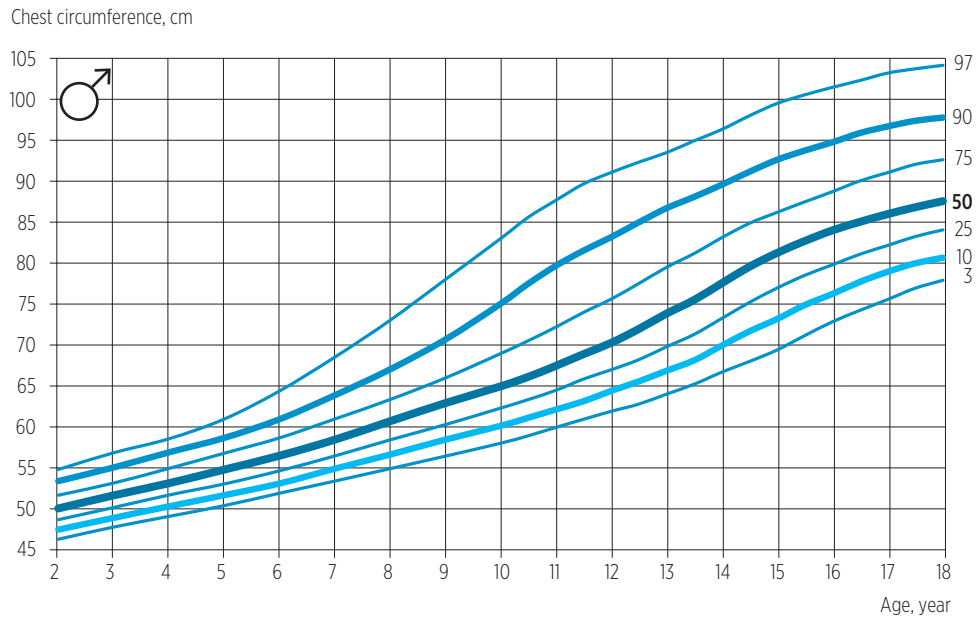


Figure 3.23

Reference percentiles of chest circumference from the age of 2 to 18 years (boys)

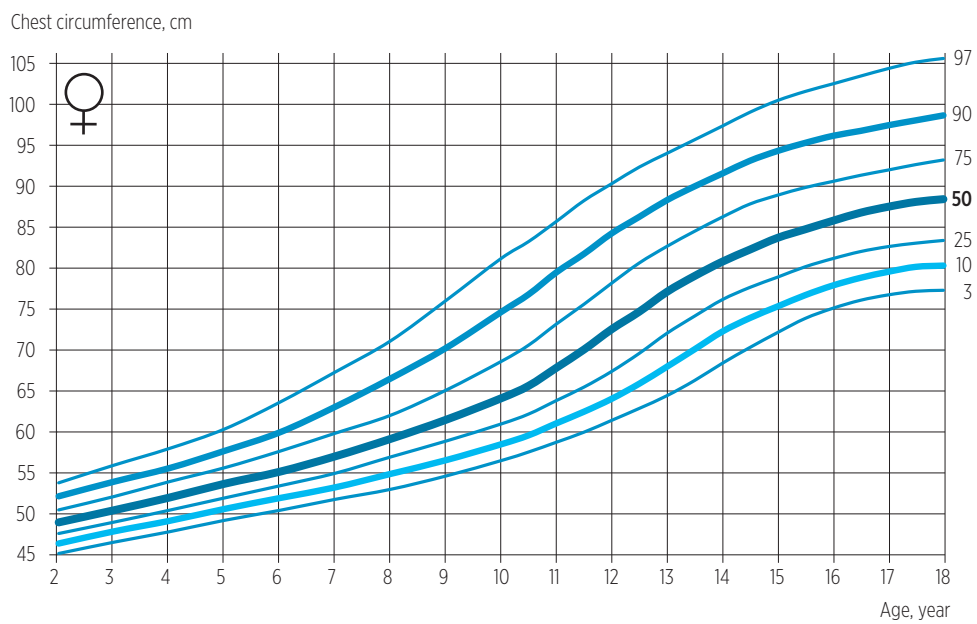


Figure 3.24

Reference percentiles of chest circumference from the age of 2 to 18 years (girls)

Table 3.13

Reference means and percentiles of abdominal circumference from the age of 7 to 18 years (boys)

Age (year)	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (cm)						
				3	10	25	50	75	90	97
7	2 321	55.51	5.09	48.06	50.04	52.04	55.01	58.02	62.04	68.05
8	2 279	57.73	5.37	50.04	52.03	54.04	57.01	60.04	65.07	71.04
9	2 229	59.92	5.91	52.00	54.01	56.02	59.02	62.06	68.10	75.07
10	2 140	62.02	6.34	53.02	55.04	58.01	61.02	65.04	72.01	77.12
10.5	1 608	63.10	6.40	54.02	56.03	59.01	62.02	66.08	73.04	78.11
11	1 683	64.26	6.57	55.01	57.03	60.01	63.03	67.12	74.11	80.01
11.5	1 538	65.19	6.66	55.06	58.02	60.06	64.06	69.04	76.01	80.10
12	1 605	66.31	6.63	56.03	59.01	62.01	65.06	70.07	76.11	82.01
12.5	1 458	67.36	6.66	57.04	60.00	63.00	66.08	71.11	78.00	82.06
13	1 526	68.46	6.57	58.02	61.02	64.02	68.01	73.03	78.08	83.02
13.5	1 391	69.54	6.27	59.04	62.03	65.05	69.04	74.02	78.12	83.02
14	1 452	70.78	6.17	60.05	63.05	66.11	70.08	75.05	79.12	84.04
14.5	1 039	72.20	6.00	61.90	65.10	68.00	71.50	76.00	80.60	84.80
15	1 074	73.30	6.20	63.00	66.00	69.00	72.50	77.00	82.00	86.10
15.5	764	74.30	5.90	64.30	67.50	70.00	73.50	77.80	83.00	86.90
16	824	75.10	6.20	65.20	68.00	70.60	74.20	78.80	84.10	88.80
16.5	608	75.90	6.10	66.10	69.00	71.50	75.00	79.50	85.00	89.20
17	641	76.40	6.10	66.00	69.00	72.00	75.60	80.30	85.00	90.00
17.5	459	77.20	6.10	67.00	70.00	72.60	76.30	81.00	86.00	90.00
18	484	77.40	6.10	67.20	70.10	73.00	77.00	81.50	86.00	90.10

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.14

Reference means and percentiles of abdominal circumference from the age of 7 to 18 years (girls)

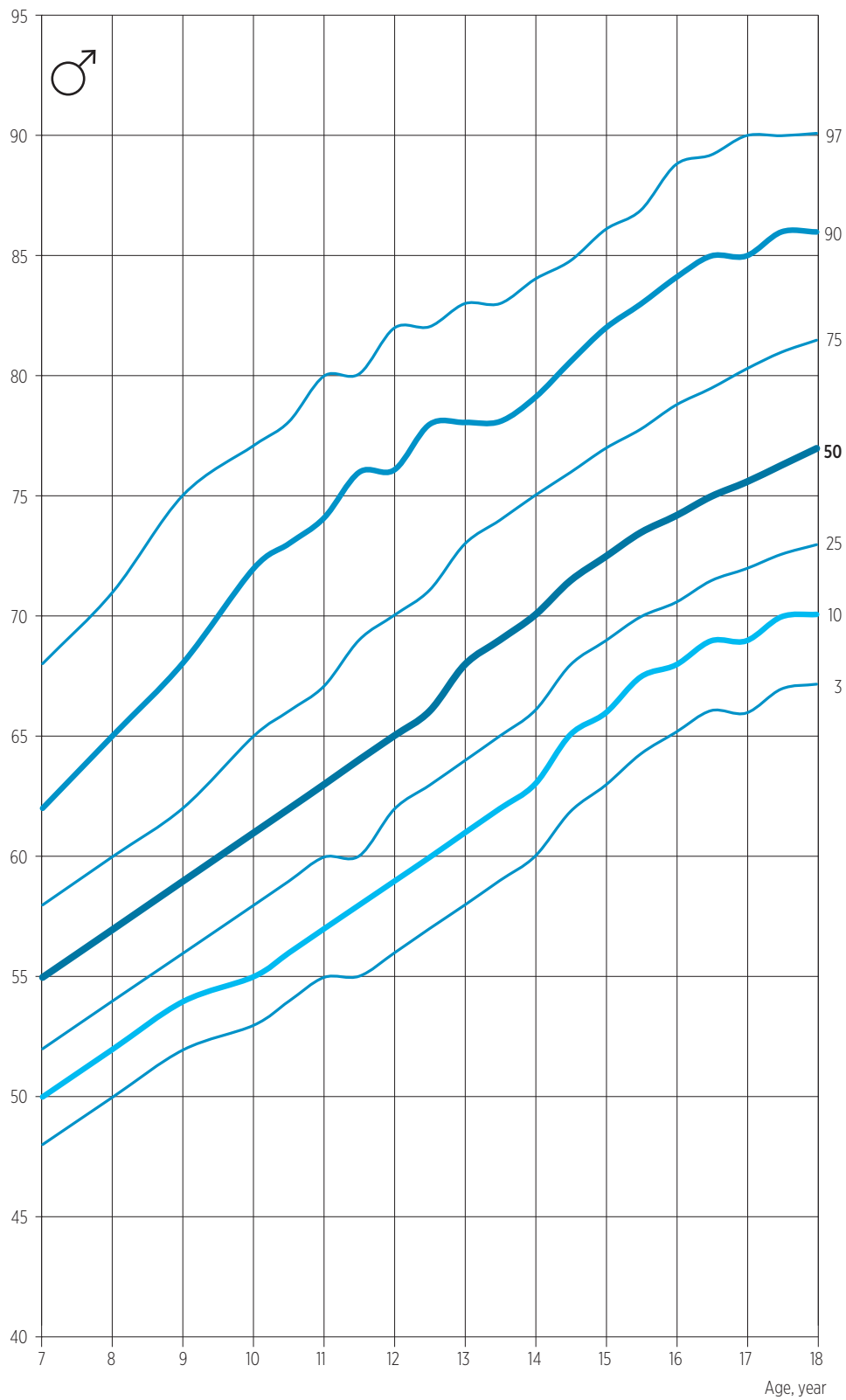
Age (year)	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (cm)						
				3	10	25	50	75	90	97
7	2 090	54.82	5.06	47.04	49.05	51.06	54.03	58.01	61.91	67.02
8	2 063	57.15	5.62	49.04	51.04	53.05	56.04	60.03	65.04	71.04
9	2 048	59.42	6.21	51.00	53.01	55.03	58.05	63.01	68.12	74.05
10	1 980	61.61	6.71	52.02	54.03	57.01	60.06	65.10	71.09	78.04
10.5	1 531	62.70	6.64	53.02	55.05	58.02	61.06	66.11	73.03	78.08
11	1 600	64.05	6.77	54.03	56.05	59.03	63.02	68.08	74.09	79.09
11.5	1 473	64.84	6.62	55.01	57.03	60.03	64.03	69.06	74.09	80.01
12	1 558	65.95	6.66	56.02	58.03	61.03	65.07	70.07	75.10	81.01
12.5	1 437	66.94	6.53	57.01	59.04	62.04	66.09	71.05	76.09	82.02
13	1 525	68.11	6.52	58.01	60.04	63.06	67.10	72.10	77.11	83.00
13.5	1 377	68.82	6.28	58.06	61.05	64.08	68.09	73.07	78.00	83.01
14	1 457	69.71	6.33	60.00	62.03	65.07	69.07	74.05	79.01	83.07
14.5	1 077	70.50	6.30	60.50	63.00	66.00	70.00	74.50	79.40	83.90
15	1 108	71.20	6.50	60.90	63.30	66.50	70.00	75.40	81.00	84.90
15.5	808	71.80	6.50	61.00	64.10	67.00	71.00	76.00	81.50	85.60
16	854	72.10	6.50	62.00	64.40	67.10	71.20	76.30	81.60	85.60
16.5	613	72.50	6.70	61.70	64.50	67.50	71.30	77.10	82.00	86.30
17	671	72.80	6.70	62.10	64.80	68.00	72.00	77.30	83.10	87.00
17.5	453	73.20	7.00	61.70	65.00	68.20	72.10	78.00	83.40	87.50
18	511	73.80	7.20	62.00	65.00	68.50	72.90	78.60	84.00	87.50

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Abdominal circumference, cm



Based on the reference data of the Hungarian Longitudinal Growth Study.

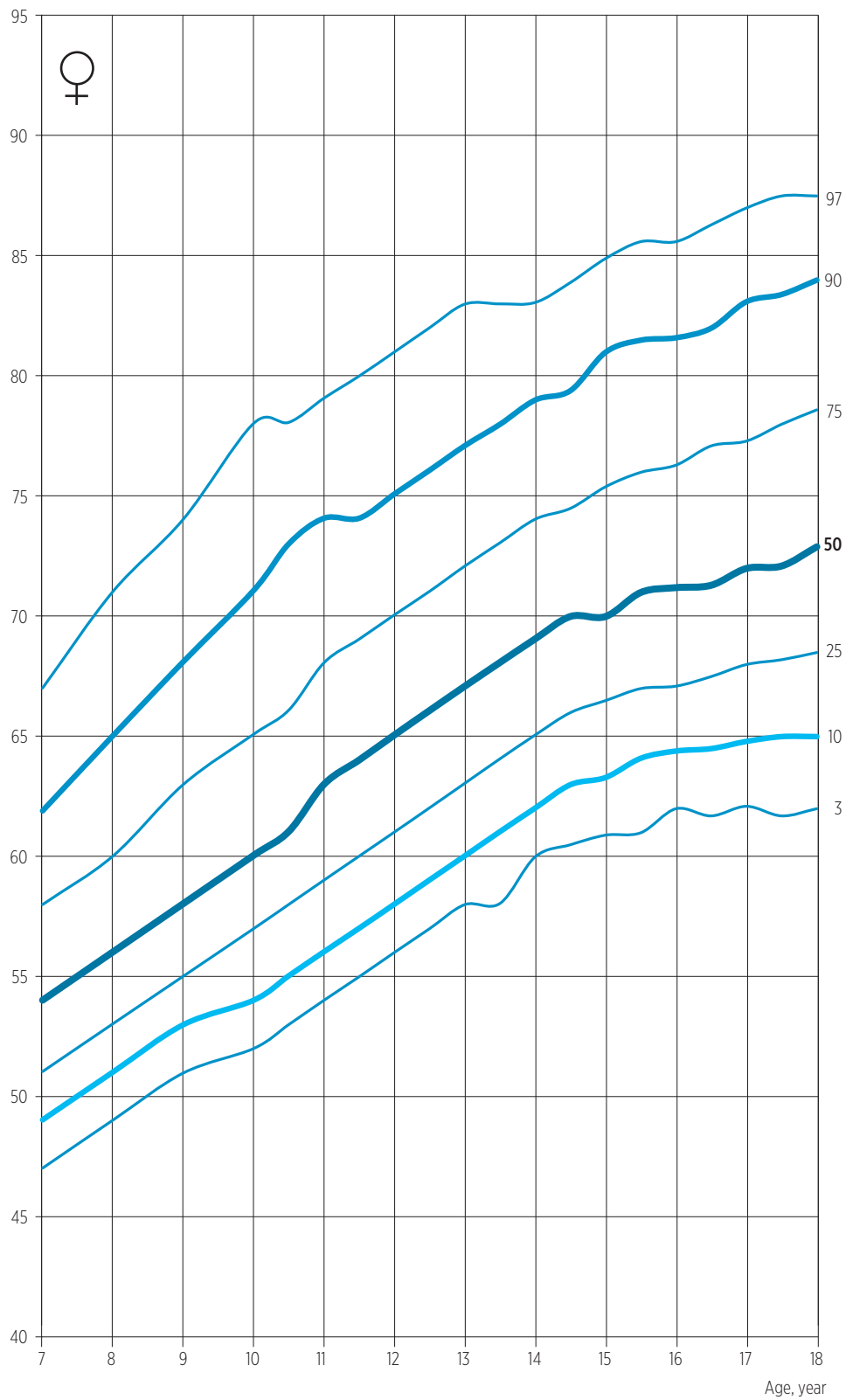
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Figure 3.25

Reference percentiles of abdominal circumference from the age of 7 to 18 years (boys)

Abdominal circumference, cm



Based on the reference data of the Hungarian Longitudinal Growth Study.

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Figure 3.26

Reference percentiles of abdominal circumference from the age of 7 to 18 years (girls)

Table 3.15

Reference means and percentiles of abdominal circumference from the age of 7 to 18 years (boys)
(Values corrected by fitting a second degree polynomial)

Age (year)	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (cm)						
				3	10	25	50	75	90	97
7	2 321	55.51	5.09	48.13	49.77	51.68	54.48	57.14	62.28	68.71
8	2 279	57.73	5.37	49.75	51.67	53.84	56.79	59.99	65.46	71.55
9	2 229	59.92	5.91	51.42	53.57	55.98	59.05	62.72	68.44	74.21
10	2 140	62.02	6.34	53.13	55.50	58.09	61.28	65.33	71.22	76.71
10.5	1 608	63.10	6.40	54.00	56.46	59.13	62.38	66.60	72.54	77.89
11	1 683	64.26	6.57	54.88	57.43	60.17	63.47	67.83	73.80	79.02
11.5	1 538	65.19	6.66	55.77	58.40	61.20	64.55	69.04	75.02	80.12
12	1 605	66.31	6.63	56.67	59.38	62.22	65.62	70.21	76.18	81.17
12.5	1 458	67.36	6.66	57.59	60.36	63.23	66.68	71.36	77.29	82.17
13	1 526	68.46	6.57	58.51	61.34	64.24	67.73	72.47	78.35	83.14
13.5	1 391	69.54	6.27	59.45	62.32	65.25	68.77	73.56	79.36	84.06
14	1 452	70.78	6.17	60.40	63.31	66.24	69.80	74.62	80.32	84.93
14.5	1 039	72.20	6.00	61.35	64.30	67.23	70.82	75.65	81.23	85.77
15	1 074	73.30	6.20	62.32	65.30	68.21	71.83	76.65	82.09	86.56
15.5	764	74.30	5.90	63.30	66.30	69.19	72.83	77.62	82.90	87.30
16	824	75.10	6.20	64.29	67.30	70.15	73.82	78.56	83.66	88.01
16.5	608	75.90	6.10	65.29	68.30	71.11	74.80	79.47	84.37	88.67
17	641	76.40	6.10	66.31	69.31	72.07	75.77	80.36	85.02	89.28
17.5	459	77.20	6.10	67.33	70.32	73.02	76.74	81.21	85.63	89.85
18	484	77.40	6.10	68.36	71.33	73.96	77.69	82.03	86.19	90.38

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.16

Reference means and percentiles of abdominal circumference from the age of 7 to 18 years (girls)
(Values corrected by fitting a second degree polynomial)

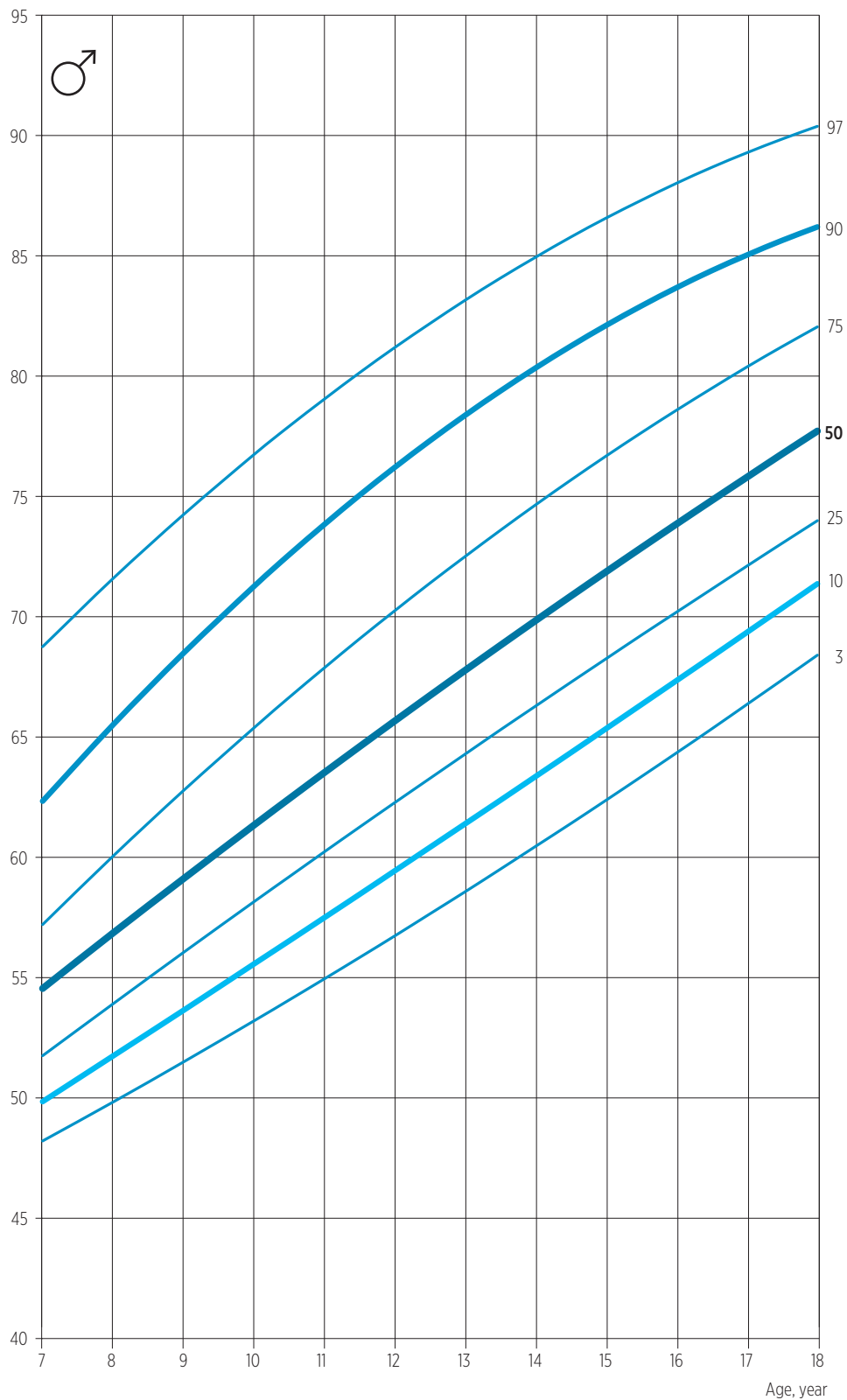
Age (year)	Case number (N)	Mean \bar{x} (cm)	SD	Percentiles (cm)						
				3	10	25	50	75	90	97
7	2 090	54.82	5.06	46.40	48.41	50.38	53.15	57.41	62.19	67.94
8	2 063	57.15	5.62	48.71	50.69	52.91	55.93	60.34	65.30	71.10
9	2 048	59.42	6.21	50.85	52.83	55.27	58.52	63.06	68.17	73.97
10	1 980	61.61	6.71	52.83	54.83	57.46	60.91	65.58	70.82	76.56
10.5	1 531	62.70	6.64	53.76	55.78	58.49	62.03	66.77	72.06	77.75
11	1 600	64.05	6.77	54.64	56.70	59.48	63.10	67.91	73.24	78.87
11.5	1 473	64.84	6.62	55.49	57.58	60.43	64.12	68.99	74.36	79.91
12	1 558	65.95	6.66	56.29	58.42	61.34	65.10	70.03	75.42	80.89
12.5	1 437	66.94	6.53	57.06	59.23	62.20	66.03	71.01	76.43	81.79
13	1 525	68.11	6.52	57.78	60.01	63.03	66.90	71.95	77.38	82.62
13.5	1 377	68.82	6.28	58.46	60.75	63.81	67.73	72.83	78.27	83.39
14	1 457	69.71	6.33	59.10	61.46	64.55	68.51	73.67	79.10	84.08
14.5	1 077	70.50	6.30	59.69	62.13	65.25	69.24	74.45	79.88	84.70
15	1 108	71.20	6.50	60.25	62.77	65.91	69.93	75.19	80.60	85.24
15.5	808	71.80	6.50	60.77	63.37	66.52	70.56	75.87	81.26	85.72
16	854	72.10	6.50	61.24	63.94	67.09	71.14	76.51	81.86	86.13
16.5	613	72.50	6.70	61.67	64.47	67.63	71.68	77.09	82.41	86.46
17	671	72.80	6.70	62.06	64.97	68.12	72.17	77.62	82.90	86.72
17.5	453	73.20	7.00	62.41	65.44	68.56	72.61	78.11	83.33	86.92
18	511	73.80	7.20	62.72	65.87	68.97	73.00	78.54	83.70	87.04

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Abdominal circumference, cm



Based on the reference data of the Hungarian Longitudinal Growth Study.

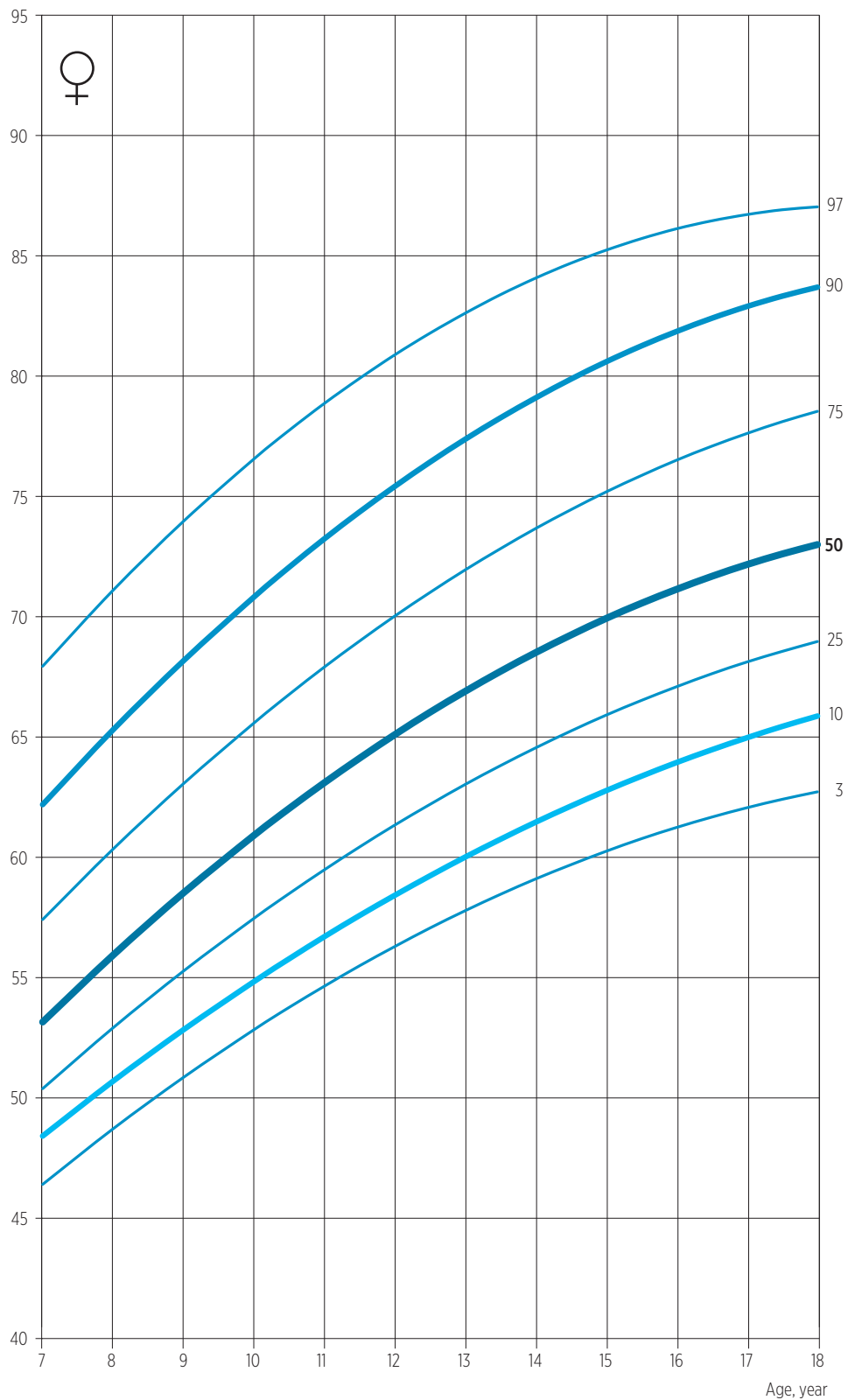
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Figure 3.27

Reference percentiles of abdominal circumference from the age of 7 to 18 years (boys)
(Values corrected by fitting a second degree polynomial)

Abdominal circumference, cm



Based on the reference data of the Hungarian Longitudinal Growth Study.

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Figure 3.28

Reference percentiles of abdominal circumference from the age of 7 to 18 years (girls)
(Values corrected by fitting a second degree polynomial)

Table 3.17

Reference means and percentiles of triceps skinfold thickness from the age of 3 to 18 years (boys)

Age (year)	Case number (N)	Mean \bar{x} (mm)	SD	Percentiles (mm)						
				3	10	25	50	75	90	97
3	2 094	10.1	3.3	5	6	8	10	12	14	17
4	2 127	10.3	3.4	5	6	8	10	12	15	18
5	2 207	10.4	3.7	5	6	8	10	12	15	19
6	2 208	10.5	4.1	5	6	8	10	13	16	20
7	2 106	10.0	4.0	4	6	7	10	12	15	20
8	2 081	10.6	4.3	4	6	8	10	12	16	21
9	2 074	11.1	4.7	4	6	8	10	14	18	22
10	2 023	11.7	5.0	4	6	8	11	15	19	23
10.5	1 564	12.2	5.3	4	6	8	11	15	20	24
11	1 645	12.3	5.4	4	6	8	11	15	20	25
11.5	1 533	12.5	5.4	4	7	9	12	15	20	25
12	1 619	12.6	5.4	4	7	9	12	16	20	25
12.5	1 501	12.9	5.4	5	7	9	12	16	20	25
13	1 593	13.0	5.4	5	7	9	12	16	20	25
13.5	1 452	13.6	5.4	5	8	10	13	17	21	25
14	1 528	13.8	5.5	5	8	10	13	17	21	26
14.5	1 137	14.3	5.5	6	8	10	14	18	21	26
15	1 160	14.8	5.8	5	8	11	14	18	22	27
15.5	839	15.3	5.7	6	9	11	14	19	22	29
16	882	15.2	5.9	5	9	11	15	19	23	28
16.5	632	15.1	5.7	6	8	11	14	18	23	28
17	690	15.0	5.8	6	9	11	14	19	22	30
17.5	466	14.4	5.9	5	7	10	14	18	22	28
18	522	14.3	6.0	5	7	10	14	18	22	28

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.18

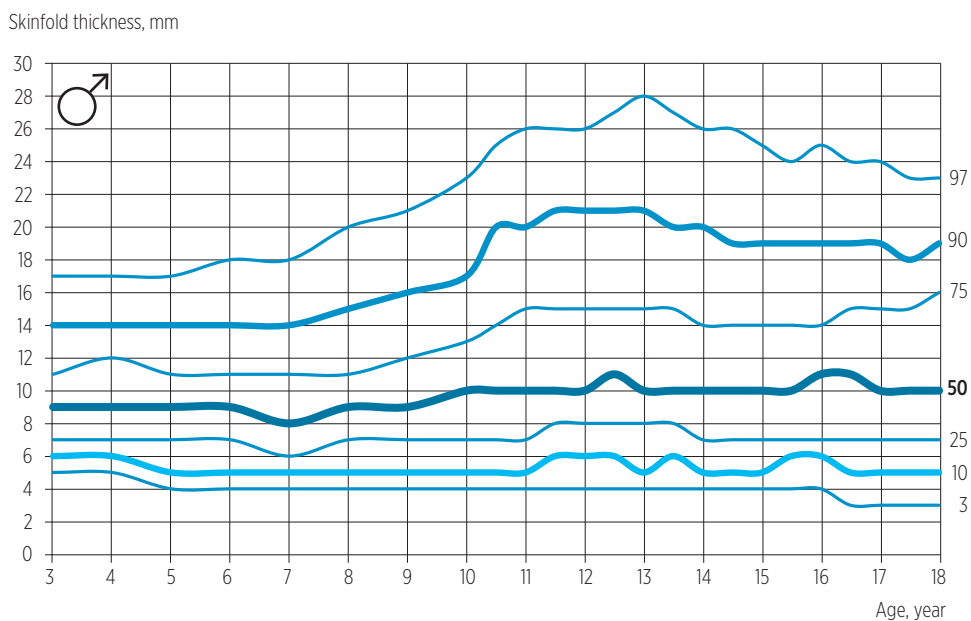
Reference means and percentiles of triceps skinfold thickness from the age of 3 to 18 years (girls)

Age (year)	Case number (N)	Mean \bar{x} (mm)	SD	Percentiles (mm)						
				3	10	25	50	75	90	97
3	2 094	10.1	3.3	5	6	8	10	12	14	17
4	2 127	10.3	3.4	5	6	8	10	12	15	18
5	2 207	10.4	3.7	5	6	8	10	12	15	19
6	2 208	10.5	4.1	5	6	8	10	13	16	20
7	2 106	10.0	4.0	4	6	7	10	12	15	20
8	2 081	10.6	4.3	4	6	8	10	12	16	21
9	2 074	11.1	4.7	4	6	8	10	14	18	22
10	2 023	11.7	5.0	4	6	8	11	15	19	23
10.5	1 564	12.2	5.3	4	6	8	11	15	20	24
11	1 645	12.3	5.4	4	6	8	11	15	20	25
11.5	1 533	12.5	5.4	4	7	9	12	15	20	25
12	1 619	12.6	5.4	4	7	9	12	16	20	25
12.5	1 501	12.9	5.4	5	7	9	12	16	20	25
13	1 593	13.0	5.4	5	7	9	12	16	20	25
13.5	1 452	13.6	5.4	5	8	10	13	17	21	25
14	1 528	13.8	5.5	5	8	10	13	17	21	26
14.5	1 137	14.3	5.5	6	8	10	14	18	21	26
15	1 160	14.8	5.8	5	8	11	14	18	22	27
15.5	839	15.3	5.7	6	9	11	14	19	22	29
16	882	15.2	5.9	5	9	11	15	19	23	28
16.5	632	15.1	5.7	6	8	11	14	18	23	28
17	690	15.0	5.8	6	9	11	14	19	22	30
17.5	466	14.4	5.9	5	7	10	14	18	22	28
18	522	14.3	6.0	5	7	10	14	18	22	28

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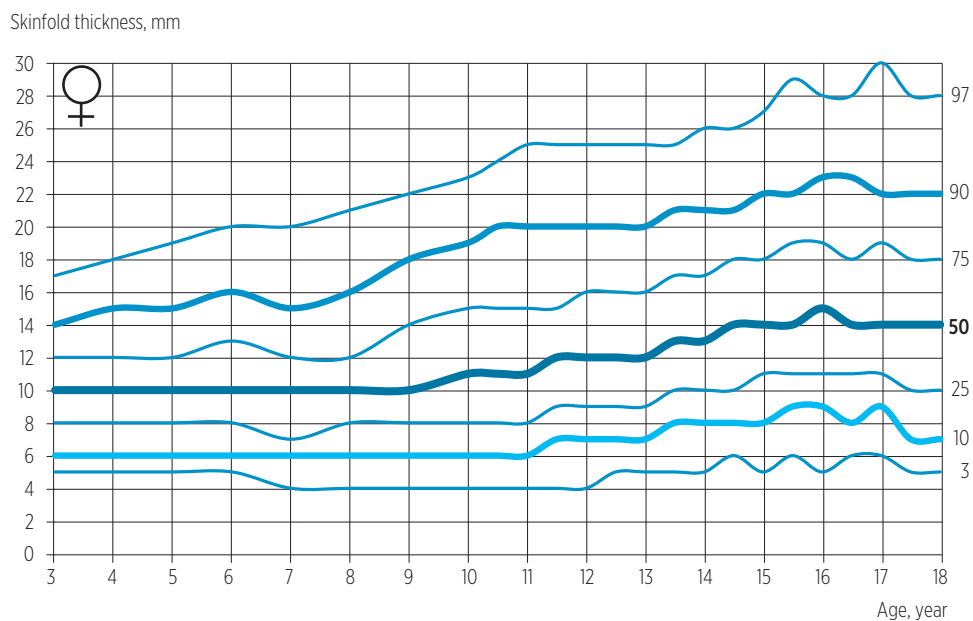
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Figure 3.29

Reference percentiles of triceps skinfold thickness from the age of 3 to 18 years (boys)



Based on the reference data of the Hungarian Longitudinal Growth Study.

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Figure 3.30

Reference percentiles of triceps skinfold thickness from the age of 3 to 18 years (girls)

Table 3.19

Reference means and percentiles of subscapular skinfold thickness from the age of 3 to 18 years (boys)

Age (year)	Case number (N)	Mean \bar{x} (mm)	SD	Percentiles (mm)						
				3	10	25	50	75	90	97
3	2 352	7.0	2.4	3	4	5	7	8	10	12
4	2 396	6.8	2.6	3	4	5	6	8	10	12
5	2 455	6.6	2.7	3	4	5	6	8	10	13
6	2 468	6.6	3.1	3	4	5	6	8	10	14
7	2 336	6.2	3.1	3	4	4	5	7	10	14
8	2 310	6.5	3.5	3	4	4	6	8	10	15
9	2 278	7.1	4.1	3	4	5	6	8	12	18
10	2 223	7.7	4.7	3	4	5	6	9	13	21
10.5	1 700	8.2	5.2	3	4	5	6	10	15	22
11	1 797	8.6	5.6	3	4	5	7	10	16	24
11.5	1 665	8.9	5.9	3	4	5	7	10	17	25
12	1 751	9.0	6.0	3	4	5	7	11	17	26
12.5	1 607	9.4	6.1	3	4	5	7	11	17	26
13	1 689	9.5	6.0	3	4	6	8	11	18	26
13.5	1 554	9.5	6.0	3	5	6	8	11	17	27
14	1 617	9.5	5.7	3	5	6	8	11	17	25
14.5	1 164	9.5	5.4	4	5	6	8	11	17	25
15	1 185	9.5	5.1	4	5	6	8	11	16	23
15.5	835	9.4	4.8	4	5	6	8	11	15	21
16	888	9.6	4.8	4	5	6	9	11	15	22
16.5	654	9.5	4.5	3	5	7	9	11	14	20
17	691	9.6	4.8	3	5	6	9	11	15	22
17.5	484	9.1	4.2	3	5	6	9	11	14	17
18	516	9.1	4.1	3	5	6	9	11	14	17

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.20

Reference means and percentiles of subscapular skinfold thickness from the age of 3 to 18 years (girls)

Age (year)	Case number (N)	Mean \bar{x} (mm)	SD	Percentiles (mm)						
				3	10	25	50	75	90	97
3	2 092	7.4	2.5	4	5	6	7	9	11	13
4	2 127	7.4	2.7	4	5	5	7	9	11	14
5	2 207	7.4	3.1	3	4	5	7	9	11	15
6	2 208	7.4	3.4	3	4	5	7	9	12	16
7	2 105	7.0	3.3	3	4	5	6	8	11	15
8	2 081	7.4	3.6	3	4	5	6	9	12	17
9	2 074	8.0	4.2	3	4	5	7	9	13	19
10	2 020	8.6	4.6	3	4	5	7	10	15	20
10.5	1 564	9.0	5.2	3	4	6	7	11	16	22
11	1 645	9.3	5.3	3	5	6	8	11	17	23
11.5	1 533	9.5	5.5	3	5	6	8	11	17	24
12	1 619	9.8	5.5	4	5	6	8	12	17	24
12.5	1 499	10.2	5.5	4	5	7	9	12	18	24
13	1 591	10.5	5.4	4	6	7	9	12	18	24
13.5	1 454	10.9	5.5	4	6	7	10	13	18	25
14	1 531	11.3	5.7	4	6	8	10	14	19	25
14.5	1 138	11.3	5.3	5	6	8	10	14	18	25
15	1 160	11.5	5.5	5	6	8	10	13	18	25
15.5	839	11.7	5.3	5	7	8	10	14	18	26
16	882	11.6	5.5	5	6	8	10	14	18	26
16.5	632	11.4	5.2	5	6	8	10	13	18	24
17	690	11.5	5.3	4	7	8	10	14	19	25
17.5	467	10.8	5.0	4	6	8	10	12	18	23
18	523	10.9	5.1	3	6	8	10	13	18	24

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Skinfold thickness, mm

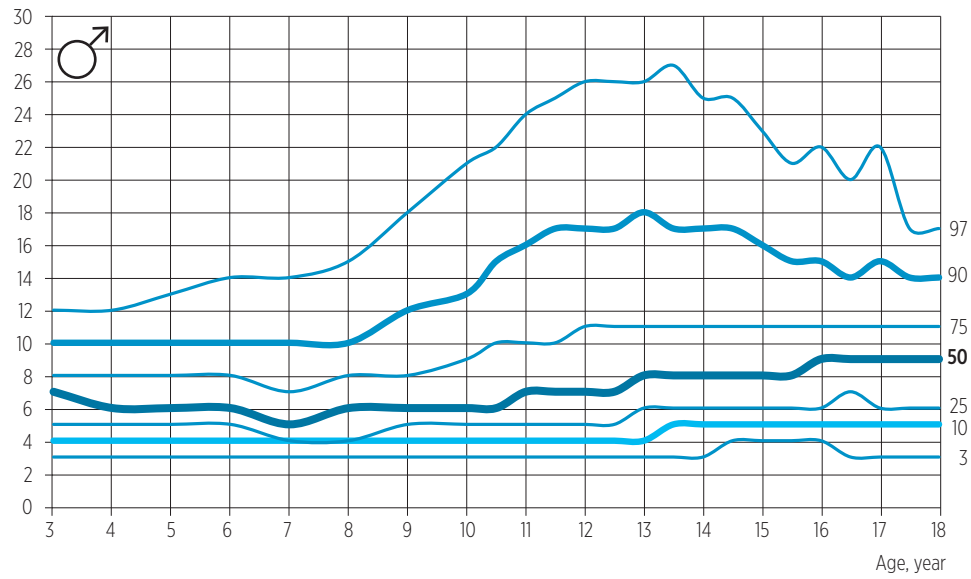


Figure 3.31

Reference percentiles of subscapular skinfold thickness from the age of 3 to 18 years (boys)

Skinfold thickness, mm

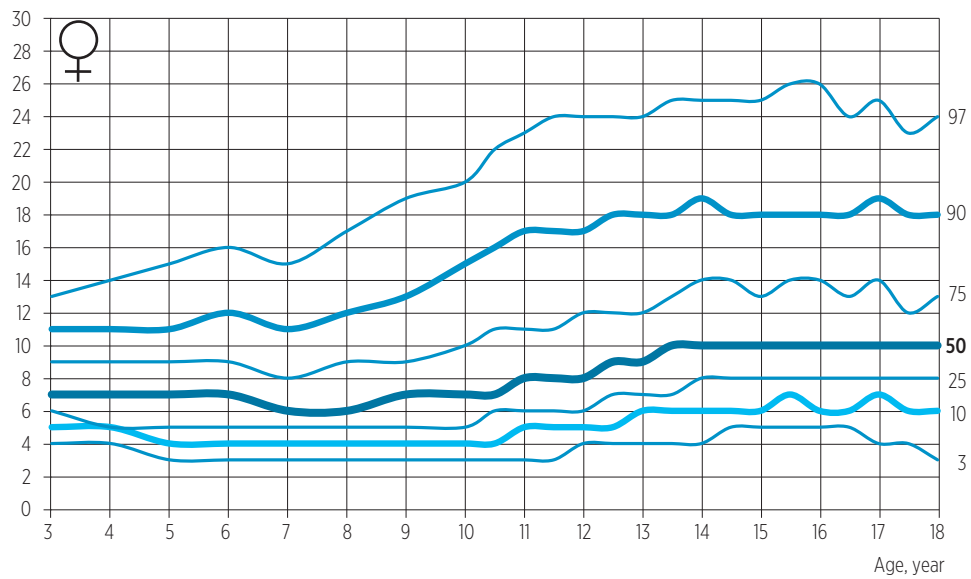


Figure 3.32

Reference percentiles of subscapular skinfold thickness from the age of 3 to 18 years (girls)

Table 3.21

Reference means and percentiles of skinfold thickness at the abdomen from the age of 7 to 18 years (boys)

Age (year)	Case number (N)	Mean \bar{x} (mm)	SD	Percentiles (mm)						
				3	10	25	50	75	90	97
7	2 335	7.3	4.2	3	4	5	6	9	12	18
8	2 305	8.0	4.7	3	4	5	7	9	14	20
9	2 275	8.8	5.4	3	4	5	7	10	15	23
10	2 220	10.0	6.3	3	4	6	8	12	19	26
10.5	1 692	10.6	7.4	3	4	6	8	13	22	30
11	1 788	11.1	7.8	3	4	6	9	14	22	30
11.5	1 656	11.5	8.2	3	4	6	9	14	24	32
12	1 739	11.9	8.3	3	4	6	9	15	24	32
12.5	1 597	12.0	8.0	3	4	7	10	15	24	31
13	1 680	12.3	8.2	3	5	7	10	15	24	34
13.5	1 541	12.2	7.9	3	5	7	10	15	23	32
14	1 606	12.1	7.6	3	5	7	10	15	23	31
14.5	1 163	11.9	7.3	4	5	7	10	15	21	31
15	1 172	12.1	7.4	4	5	7	10	15	22	30
15.5	836	11.7	6.9	4	5	7	10	14	20	28
16	888	11.8	7.0	4	5	7	10	15	20	29
16.5	654	11.6	6.6	4	5	7	10	14	19	27
17	691	11.6	6.8	4	5	7	10	14	20	27
17.5	476	11.1	6.0	4	5	7	10	13	19	24
18	508	11.1	6.0	3	5	7	10	14	20	24

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.22

Reference means and percentiles of skinfold thickness at the abdomen from the age of 7 to 18 years (girls)

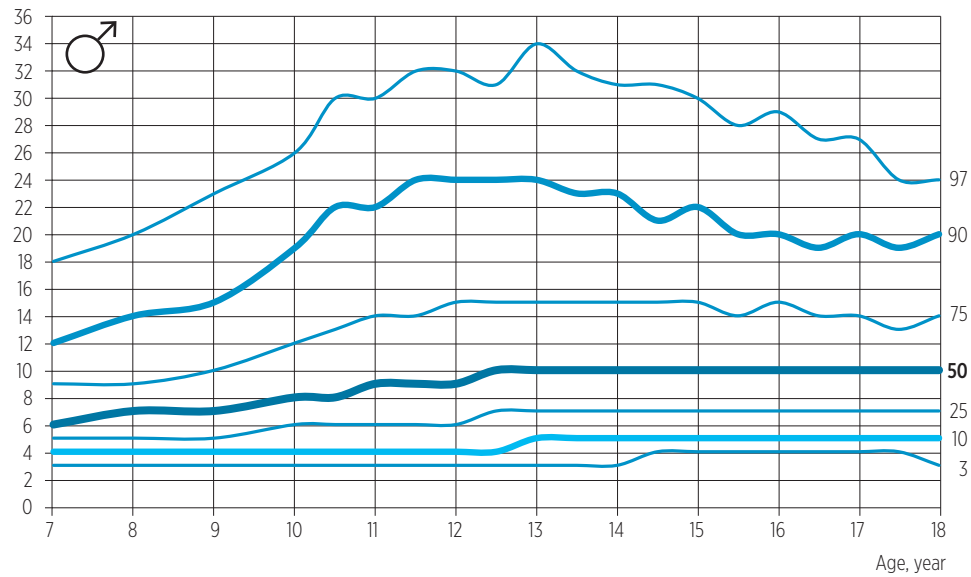
Age (year)	Case number (N)	Mean \bar{x} (mm)	SD	Percentiles (mm)						
				3	10	25	50	75	90	97
7	2 104	8.2	4.2	3	4	5	7	10	14	18
8	2 078	9.1	4.9	3	4	6	8	11	15	22
9	2 071	10.0	5.5	3	5	6	9	12	17	24
10	2 019	11.1	6.2	3	5	7	10	14	20	26
10.5	1 559	11.9	7.1	3	5	7	10	15	22	30
11	1 639	12.4	7.3	3	5	7	10	16	23	30
11.5	1 526	12.8	7.5	4	5	7	11	16	23	31
12	1 613	13.3	7.4	4	6	8	12	17	23	32
12.5	1 494	13.8	7.6	4	6	8	12	17	24	31
13	1 585	14.2	7.4	4	6	9	13	18	24	32
13.5	1 443	14.6	7.5	4	7	9	13	18	25	33
14	1 520	15.1	7.5	4	7	10	14	20	25	33
14.5	1 134	15.1	7.8	4	7	10	14	19	25	34
15	1 156	15.2	7.7	4	7	10	14	19	25	34
15.5	839	15.1	7.5	5	8	10	14	19	25	32
16	882	14.9	7.6	4	7	10	13	19	25	33
16.5	631	14.6	7.1	5	7	10	13	18	23	32
17	689	14.5	7.1	5	7	10	13	18	23	31
17.5	451	13.7	7.5	4	6	9	12	17	23	35
18	507	13.8	7.8	4	6	9	12	17	23	33

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Skinfold thickness, mm



Based on the reference data of the Hungarian Longitudinal Growth Study.

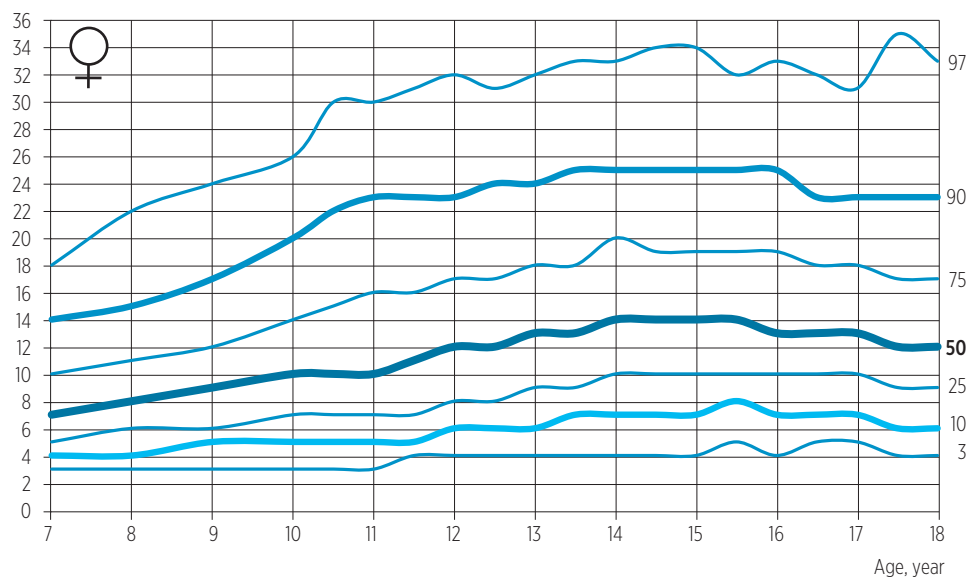
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Figure 3.33

Reference percentiles of skinfold thickness at the abdomen from the age of 7 to 18 years (boys)

Skinfold thickness, mm



Based on the reference data of the Hungarian Longitudinal Growth Study.

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Figure 3.34

Reference percentiles of skinfold thickness at the abdomen from the age of 7 to 18 years (girls)

Table 3.23

Reference means and percentiles of iliospinale skinfold thickness from the age of 7 to 18 years (boys)

Age (year)	Case number (N)	Mean \bar{x} (mm)	SD	Percentiles (mm)						
				3	10	25	50	75	90	97
7	2 332	5.6	3.4	3	3	3	5	6	10	14
8	2 305	6.1	3.9	3	3	4	5	7	10	17
9	2 274	6.7	4.5	3	3	4	5	8	12	20
10	2 218	7.4	5.1	3	3	4	6	9	14	21
10.5	1 685	8.2	5.9	2	3	4	6	10	16	24
11	1 776	8.7	6.4	2	3	4	7	11	18	26
11.5	1 645	9.1	6.6	2	3	5	7	11	18	26
12	1 723	9.3	6.8	2	3	5	7	12	19	26
12.5	1 591	9.5	6.7	2	3	5	7	12	19	27
13	1 670	9.6	6.9	2	3	5	8	12	19	28
13.5	1 539	9.6	6.8	3	4	5	8	12	18	27
14	1 597	9.4	6.5	3	4	5	8	11	18	27
14.5	1 160	9.0	6.1	2	3	5	7	11	17	25
15	1 166	9.2	6.0	2	3	5	8	11	17	25
15.5	832	9.1	5.7	2	4	5	8	11	16	23
16	884	9.1	5.7	2	3	5	8	11	16	24
16.5	652	9.0	5.5	2	4	5	8	11	15	21
17	689	9.0	5.8	2	3	5	8	11	15	23
17.5	476	8.7	5.3	2	3	5	8	11	15	20
18	506	8.8	5.3	2	3	5	8	12	15	20

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.24

Reference means and percentiles of iliospinale skinfold thickness from the age of 7 to 18 years (girls)

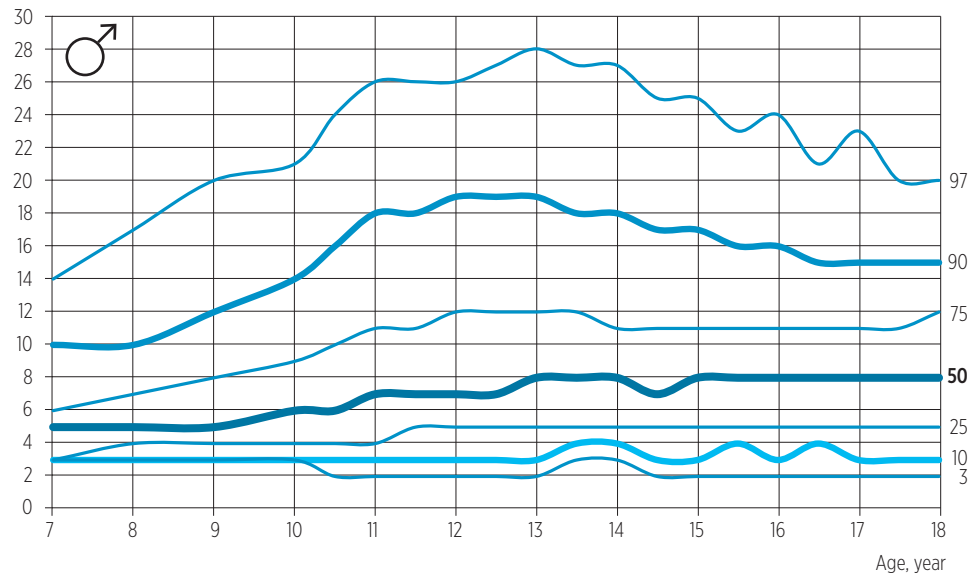
Age (year)	Case number (N)	Mean \bar{x} (mm)	SD	Percentiles (mm)						
				3	10	25	50	75	90	97
7	2 100	6.6	3.6	3	3	4	6	8	11	15
8	2 078	7.1	4.1	3	3	4	6	9	12	18
9	2 069	7.9	4.7	3	4	5	7	10	14	20
10	2 013	8.6	5.1	3	4	5	7	10	15	21
10.5	1 558	9.3	5.8	2	4	5	8	12	17	23
11	1 639	9.6	5.9	2	4	5	8	12	18	24
11.5	1 523	9.9	6.0	3	4	6	8	12	18	24
12	1 609	10.3	6.1	3	4	6	9	13	19	25
12.5	1 488	10.8	6.4	3	4	6	9	13	20	27
13	1 580	11.1	6.3	3	4	7	10	14	20	27
13.5	1 442	11.5	6.4	3	5	7	10	14	20	27
14	1 517	11.7	6.3	3	5	7	10	15	20	27
14.5	1 133	11.3	6.0	2	4	7	10	14	20	25
15	1 152	11.5	6.1	2	5	7	10	14	20	25
15.5	833	11.6	6.0	2	4	8	10	14	20	25
16	878	11.4	6.1	2	4	8	10	14	20	26
16.5	630	11.4	6.0	2	4	8	10	14	19	26
17	686	11.6	5.9	2	4	8	11	14	19	25
17.5	447	11.0	5.8	2	3	7	10	14	19	25
18	504	11.0	5.8	2	3	7	10	14	18	23

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Skinfold thickness, mm



Based on the reference data of the Hungarian Longitudinal Growth Study.

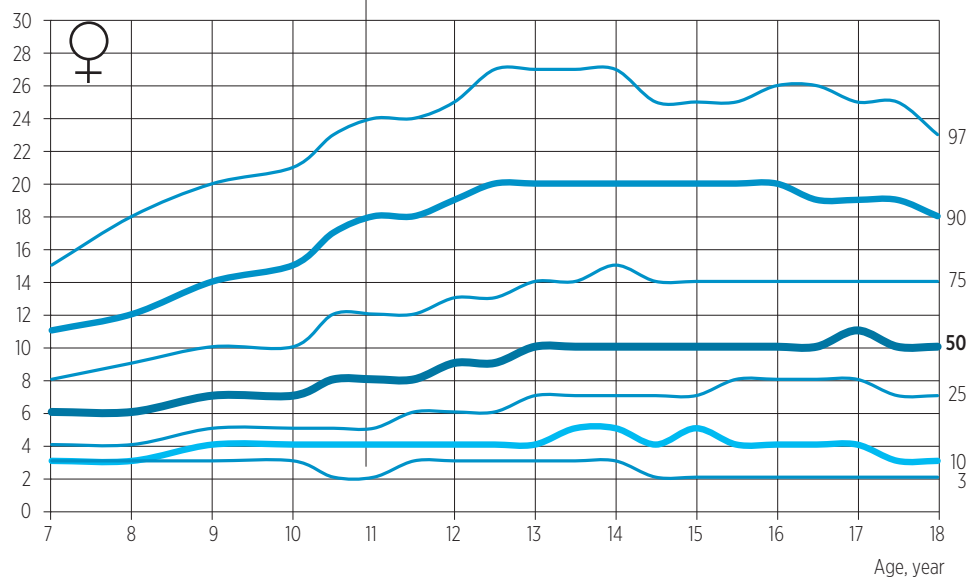
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Figure 3.35

Reference percentiles of iliospinale skinfold thickness from the age of 7 to 18 years (boys)

Skinfold thickness, mm



Based on the reference data of the Hungarian Longitudinal Growth Study.

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Figure 3.36

Reference percentiles of iliospinale skinfold thickness from the age of 7 to 18 years (girls)

Table 3.25

Reference means and percentiles of triceps, subscapular, suprailliacal, and abdominal cumulated skinfold thicknesses from the age of 7 to 18 years (boys)

Age (year)	Case number (N)	Mean \bar{x} (mm)	SD	Percentiles (mm)						
				3	10	25	50	75	90	97
7	2 330	28.1	12.7	15	17	20	25	32	43	59
8	2 301	30.1	14.5	15	17	20	26	34	47	68
9	2 272	32.6	16.9	15	18	22	28	38	53	79
10	2 216	35.7	19.6	15	18	23	30	42	61	89
10.5	1 677	38.4	22.3	14	18	24	31	46	72	98
11	1 766	40.0	23.6	14	18	24	32	49	75	103
11.5	1 635	41.5	24.5	14	19	25	34	50	77	101
12	1 715	42.5	25.1	15	19	25	35	52	79	106
12.5	1 584	43.0	24.8	15	20	26	35	52	79	105
13	1 664	43.4	25.3	15	20	26	36	52	80	108
13.5	1 530	43.1	24.5	15	20	27	36	51	77	105
14	1 590	42.3	23.5	16	21	27	36	51	74	103
14.5	1 165	41.7	22.7	17	20	26	36	50	71	103
15	1 187	41.7	22.5	16	20	26	36	50	72	102
15.5	836	41.5	21.0	17	20	27	37	49	68	92
16	889	42.0	21.1	17	20	28	38	50	67	90
16.5	655	41.4	20.3	16	20	27	40	50	64	90
17	692	41.6	21.1	15	19	26	40	49	67	94
17.5	484	39.9	18.9	14	19	26	39	48	64	80
18	516	40.1	19.3	14	18	25	39	50	66	78

Based on the reference data of the Hungarian Longitudinal Growth Study.

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Table 3.26

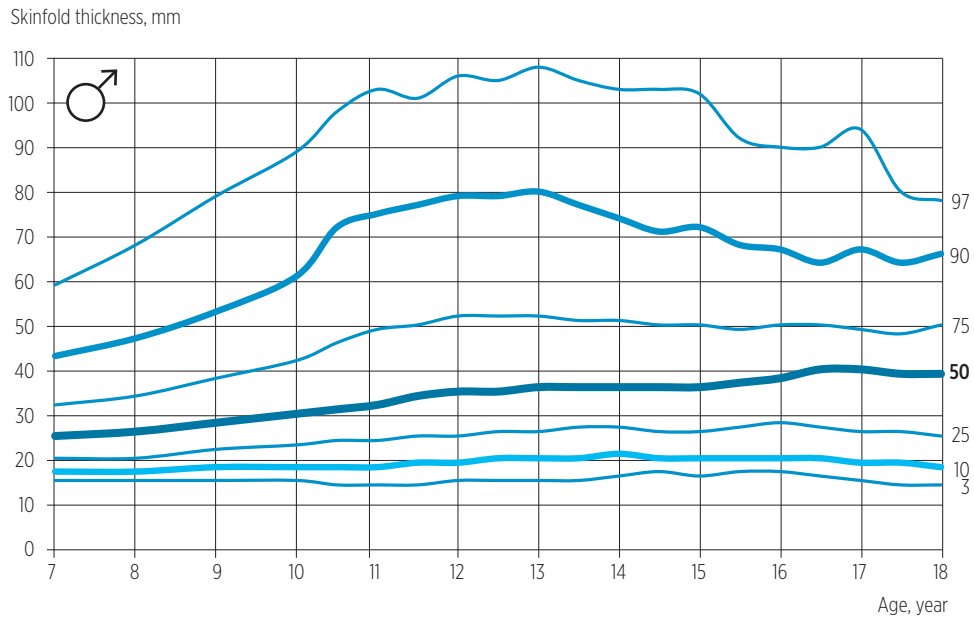
Reference means and percentiles of triceps, subscapular, suprailliacal, and abdominal cumulated skinfold thicknesses from the age of 7 to 18 years (girls)

Age (year)	Case number (N)	Mean \bar{x} (mm)	SD	Percentiles (mm)						
				3	10	25	50	75	90	97
7	2 099	31.9	13.3	16	19	23	29	37	48	64
8	2 073	34.2	15.2	16	20	24	30	39	54	75
9	2 067	36.9	17.4	16	20	25	32	44	60	82
10	2 011	39.9	19.0	17	21	26	35	49	66	88
10.5	1 554	42.4	21.4	16	21	27	37	53	71	96
11	1 636	43.5	21.8	16	22	28	38	54	74	100
11.5	1 520	44.8	22.2	17	23	29	39	55	77	98
12	1 606	46.1	22.2	18	24	31	40	56	78	99
12.5	1 485	47.8	22.6	18	25	32	43	59	79	100
13	1 575	48.7	21.9	19	26	34	44	60	79	100
13.5	1 437	50.6	22.4	21	27	35	46	63	81	104
14	1 510	51.9	22.1	20	29	36	48	63	82	103
14.5	1 138	51.9	22.1	21	28	37	48	63	80	103
15	1 161	52.8	22.5	20	29	37	49	64	82	106
15.5	839	53.6	22.0	21	29	38	49	65	82	108
16	882	52.9	22.5	20	29	38	49	64	81	110
16.5	632	52.4	21.4	20	28	39	50	62	79	108
17	690	52.5	21.5	21	28	39	49	63	78	108
17.5	467	49.2	22.3	15	24	35	46	60	76	103
18	523	49.4	22.5	15	23	36	46	62	75	103

Based on the reference data of the Hungarian Longitudinal Growth Study.

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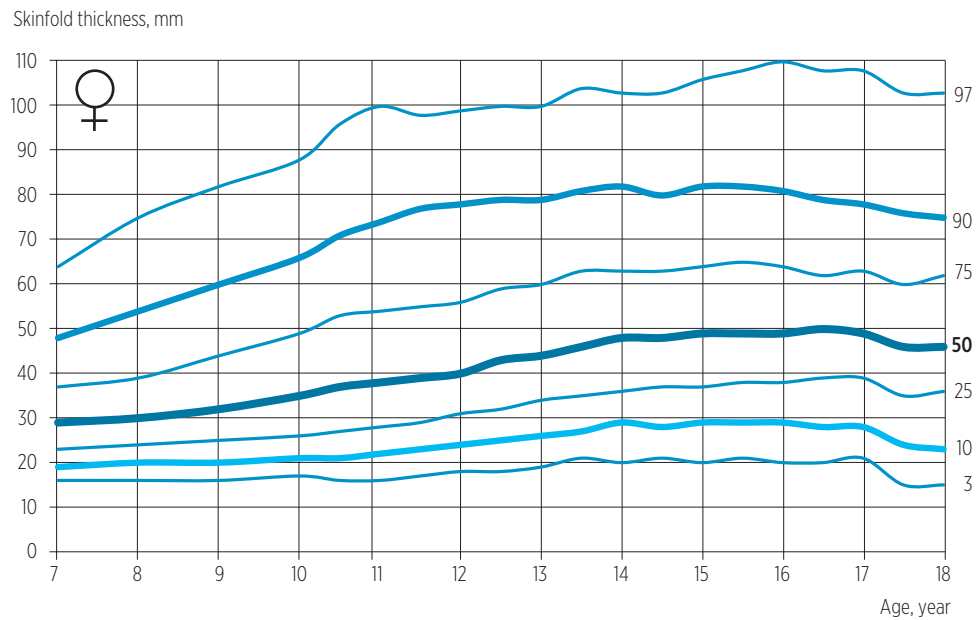
Based on the reference data of the Hungarian Longitudinal Growth Study.

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Figure 3.37

Reference percentiles of triceps, subscapular, suprailliacal, and abdominal cumulated skinfold thicknesses from the age of 7 to 18 years (boys)



Based on the reference data of the Hungarian Longitudinal Growth Study.

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Figure 3.38

Reference percentiles of triceps, subscapular, suprailliacal, and abdominal cumulated skinfold thicknesses from the age of 7 to 18 years (girls)