FORMELSAMMLUNG (*Stand: 2012.12.28.*)

$$\bar{x} = \frac{x_1 + x_2 + \ldots + x_n}{n} = \frac{\sum_{i=1}^{n} x_i}{n}$$

$$x_{\text{med}} = \begin{cases} x_{(n+1)/2} & \text{falls } n \text{ ungerade} \\ (x_{n/2} + x_{(n/2+1)})/2 & \text{falls } n \text{ gerade} \end{cases}$$

$$s = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{Q_{xx}}{n-1}}$$

$$p(E) = \frac{g}{m}$$

$$p(A) = \frac{k}{n}$$

$$p(A|B) = \frac{p(A \text{ und } B)}{p(B)}$$

$$\text{RR} = \frac{p(K_+|R_+)}{p(K_+|R_-)} = \frac{\frac{a}{a+b}}{\frac{c}{c+d}} = \frac{a(c+d)}{c(a+b)}$$

$$\text{OR} = \frac{\frac{p(K_+|R_+)}{p(K_-|R_+)}}{\frac{p(K_+|R_-)}{p(K_-|R_-)}} = \frac{ad}{bc}$$

$$\mu = \sum_i x_i p(x_i)$$

$$\mu = \int_{-\infty}^{+\infty} x f(x) dx$$

$$\sigma^2 = \sum_i (x_i - \mu)^2 p(x_i)$$

$$\sigma^2 = \int_{-\infty}^{+\infty} (x-\mu)^2 f(x) dx$$

$p(x_i) = 1/n$

$$\mu = \frac{n+1}{2}$$

$$\sigma^2 = \frac{n^2 - 1}{12}$$

$$f(x) = \begin{cases} \frac{1}{b-a}, & \text{für } a \le x \le b \\ 0, & \text{sonst} \end{cases}$$

$$\mu = \frac{a+b}{2}$$

$$\sigma^2 = \frac{(b-a)^2}{12}$$

$$p_k = \binom{n}{k} p^k (1-p)^{n-k}$$

$$\mu = np$$

$$\sigma^2 = np(1-p)$$

$$p_k = \frac{\lambda^k}{k!} e^{-\lambda}$$

$$\mu = \lambda$$

$$\sigma^2 = \lambda$$

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

$$p(\mu - \sigma \le x \le \mu + \sigma) = 68\%$$

$$p(\mu - 2\sigma \le x \le \mu + 2\sigma) = 95\%$$

$$p(\mu - 3\sigma \le x \le \mu + 3\sigma) = 99{,}7\%$$

$$f(x) = \frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}} = N(0,1)$$

$$\chi_n^2 = x_1^2 + x_2^2 + \ldots + x_n^2$$

$$\mu = n$$

$$\sigma^2 = 2n$$

$$t_n = \frac{x}{\sqrt{\frac{(x_1^2 + x_2^2 + \ldots + x_n^2)}{n}}}$$

$\mu_n=0$

$$\sigma^2 = \frac{n}{n-2}$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$$

$$s_{\bar{x}} = \frac{s_x}{\sqrt{n}}$$

$$\bar{x} \pm 2\frac{\sigma}{\sqrt{n}} \text{ — } 95\%$$

$$\bar{x} \pm 2s_{\bar{x}} \text{ — } 95\%$$

$$\bar{x} \pm t_{5\%}s_{\bar{x}} \text{ — } 95\%$$

$$p \pm 2\sqrt{p(1-p)/n} \text{ — } 95\%$$

$$t_{[n-1]} = \frac{\bar{x}}{s_{\bar{x}}}$$

$$t_{[n-1]} = \frac{\bar{x}-\mu_0}{s_{\bar{x}}}$$

$$t_{[n_1+n_2-2]} = \frac{\bar{x}_1-\bar{x}_2}{\sqrt{\frac{Q_1+Q_2}{n_1+n_2-2}}}\sqrt{\frac{n_1n_2}{n_1+n_2}}$$

$$Q_1 = \sum_{i=1}^{n_1}(x_{1i}-\bar{x}_1)^2 \text{ und } Q_2 = \sum_{i=1}^{n_2}(x_{2i}-\bar{x}_2)^2$$

$$F_{[n_1-1;n_2-1]} = \frac{s^2_{\text{größer}}}{s^2_{\text{kleiner}}}$$

$$F_{[h-1;N-h]} = \frac{s_g^2}{s_i^2}$$

$$s_g^2 = \frac{\sum_{j=1}^{h} n_j\left(\bar{x}_j-\bar{\bar{x}}\right)^2}{h-1} = \frac{Q_g}{h-1}$$

$$s_i^2 = \frac{\sum_{j=1}^{h} Q_j}{N-h} = \frac{\sum_{j=1}^{h}\sum_{i=1}^{n_j}(x_{ij}-x_j)^2}{N-h} = \frac{Q_i}{N-h}$$

$$t_{[n-1]} = \frac{\bar{R}}{\frac{s}{\sqrt{n}}}$$

$$z = \frac{T_1-\mu}{\sigma} = \frac{T_1-\frac{n_1(n_1+n_2+1)}{2}}{\sqrt{\frac{n_1n_2(n_1+n_2+1)}{12}}}$$

$$Q(a,b) = \sum_{i=1}^{n}[y_i-(ax_i+b)]^2$$

$$a^* = \frac{Q_{xy}}{Q_{xx}} = \frac{s^2_{xy}}{s^2_x}$$

$$Q_{xy} = \sum_{i=1}^{n}(x_i-\bar{x})(y_i-\bar{y})$$

$$Q_{xx} = \sum_{i=1}^{n}(x_i-\bar{x})^2$$

$$s^2_{xy} = \frac{Q_{xy}}{n-1}$$

$$b^* = \bar{y}-a^*\bar{x}$$

$$r = \frac{Q_{xy}}{\sqrt{Q_{xx}Q_{yy}}} = \frac{s^2_{xy}}{s_xs_y}$$

$$t_{[n-2]} = r\sqrt{\frac{n-2}{1-r^2}}$$

$$\chi^2 = \sum_i \frac{(O_i-E_i)^2}{E_i}$$

$$\chi^2_{[1]} = \frac{n(ad-bc)^2}{(a+b)(c+d)(a+c)(b+d)}$$

$$I(p) = \log_2\left(\frac{1}{p}\right) = -\log_2(p)$$

$$I = \sum_{k=1}^{m} n_k I_k = -\sum_{k=1}^{m} \left[n_k \cdot \log_2\left(p_k\right)\right]$$

$$H = \bar{I} = -\sum_{k=1}^{m} \left[p_k \cdot \log_2\left(p_k\right)\right]$$

$$\mathrm{w} = \frac{\mathrm{RP} + \mathrm{FN}}{\mathrm{RP} + \mathrm{FP} + \mathrm{FN} + \mathrm{RN}}$$

$$\mathrm{se} = \frac{\mathrm{RP}}{\mathrm{RP} + \mathrm{FN}}$$

$$\mathrm{sp} = \frac{\mathrm{RN}}{\mathrm{RN} + \mathrm{FP}}$$

$$\mathrm{de} = \frac{\mathrm{RP} + \mathrm{RN}}{\mathrm{RP} + \mathrm{FP} + \mathrm{FN} + \mathrm{RN}} = \mathrm{se} \cdot \mathrm{w} + \mathrm{sp} \cdot (1 - \mathrm{w})$$

$$\mathrm{PPV} = \frac{\mathrm{RP}}{\mathrm{RP} + \mathrm{FP}} = \frac{\mathrm{se} \cdot \mathrm{w}}{\mathrm{se} \cdot \mathrm{w} + (1 - \mathrm{sp}) \cdot (1 - \mathrm{w})}$$

$$\mathrm{NPV} = \frac{\mathrm{RN}}{\mathrm{RN} + \mathrm{FN}} = \frac{\mathrm{sp} \cdot (1 - \mathrm{w})}{\mathrm{sp} \cdot (1 - \mathrm{w}) + (1 - \mathrm{se}) \cdot \mathrm{w}}$$

$$n = 10 \cdot \lg \frac{P_2}{P_1} = 20 \cdot \lg \frac{U_2}{U_1}$$

$$V_P = \frac{P_{\mathrm{aus}}}{P_{\mathrm{ein}}}$$

$$V_U = \frac{U_{\mathrm{aus}}}{U_{\mathrm{ein}}}$$

$$V_P^* = \frac{V_P}{1 - K \cdot V_P}$$

STATISTISCHE TABELLEN

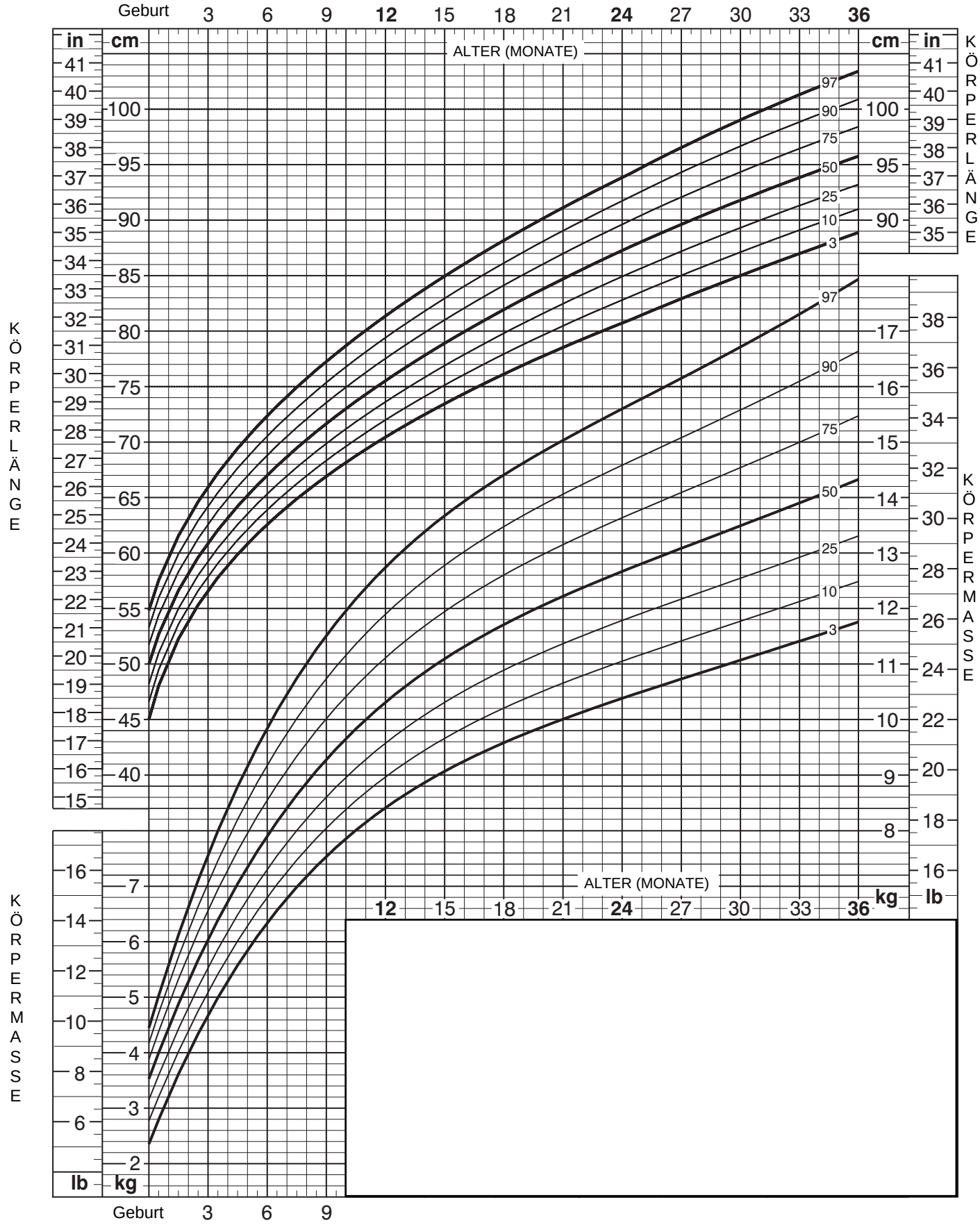
t-VERTEILUNG

Freiheits-grad (FG)	*p* (Irrtumswahrscheinlichkeit, einseitiger Test)						
	0,4	**0,25**	**0,1**	**0,05**	**0,025**	**0,01**	**0,005**
	p (Irrtumswahrscheinlichkeit, zweiseitiger Test)						
	0,8	**0,5**	**0,2**	**0,1**	**0,05**	**0,02**	**0,01**
1	0,325	1,000	3,078	6,314	12,70	31,82	63,65
2	0,289	0,816	1,886	2,920	4,303	6,965	9,925
3	0,277	0,765	1,638	2,353	3,182	4,541	5,841
4	0,271	0,741	1,533	2,132	2,776	3,747	4,604
5	0,267	0,727	1,476	2,015	2,571	3,365	4,032
6	0,265	0,718	1,440	1,943	2,447	3,143	3,707
7	0,263	0,711	1,415	1,895	2,365	2,998	3,499
8	0,262	0,706	1,397	1,860	2,306	2,896	3,355
9	0,261	0,703	1,383	1,833	2,262	2,821	3,250
10	0,260	0,700	1,372	1,812	2,228	2,764	3,169
11	0,260	0,697	1,363	1,796	2,201	2,718	3,106
12	0,259	0,695	1,356	1,782	2,179	2,681	3,055
13	0,259	0,694	1,350	1,771	2,160	2,650	3,012
14	0,258	0,692	1,345	1,761	2,145	2,624	2,977
15	0,258	0,691	1,341	1,753	2,131	2,602	2,947
16	0,258	0,690	1,337	1,746	2,120	2,583	2,921
17	0,257	0,689	1,333	1,740	2,110	2,567	2,898
18	0,257	0,688	1,330	1,734	2,101	2,552	2,878
19	0,257	0,688	1,328	1,729	2,093	2,539	2,861
20	0,257	0,687	1,325	1,725	2,086	2,528	2,845
21	0,257	0,686	1,323	1,721	2,080	2,518	2,831
22	0,256	0,686	1,321	1,717	2,074	2,508	2,819
23	0,256	0,685	1,319	1,714	2,069	2,500	2,807
24	0,256	0,685	1,318	1,711	2,064	2,492	2,797
25	0,256	0,684	1,316	1,708	2,060	2,485	2,787
26	0,256	0,684	1,315	1,706	2,056	2,479	2,779
27	0,256	0,684	1,314	1,703	2,052	2,473	2,771
28	0,256	0,683	1,313	1,701	2,048	2,467	2,763
29	0,256	0,683	1,311	1,699	2,045	2,462	2,756
30	0,256	0,683	1,310	1,697	2,042	2,457	2,750
40	0,255	0,681	1,303	1,684	2,021	2,423	2,704
60	0,255	0,679	1,296	1,671	2,000	2,390	2,66
120	0,254	0,677	1,289	1,658	1,980	2,358	2,617
∞	0,250	0,674	1,282	1,645	1,960	2,326	2,576

χ^2 (CHI-QUADRAT)-VERTEILUNG:

	p (Irrtumswahrscheinlichkeit)						
Freiheits-grad (FG)	**0,99**	**0,975**	**0,95**	**0,05**	**0,025**	**0,01**	**0,001**
1	0,0000157	0,0000982	0,000393	3,84	5,02	6,63	10,83
2	0,0201	0,0506	0,103	5,99	7,88	9,21	13,82
3	0,115	0,216	0,352	7,81	9,35	11,34	16,27
4	0,297	0,484	0,711	9,49	11,14	13,28	18,47
5	0,554	0,831	1,15	11,07	12,83	15,09	20,51
6	0,872	1,24	1,64	12,59	14,45	16,81	22,46
7	1,24	1,69	2,17	14,07	16,01	18,47	24,32
8	1,65	2,18	2,73	15,51	17,53	20,09	26,13
9	2,09	2,70	3,33	16,92	19,02	21,67	27,88
10	2,56	3,25	3,94	18,31	20,48	23,21	29,59
11	3,05	3,61	4,57	19,68	21,92	24,72	31,26
12	3,57	4,40	5,23	21,03	23,34	26,22	32,91
13	4,11	5,01	5,89	22,36	24,74	27,69	34,53
14	4,66	5,63	6,57	23,68	26,12	29,14	36,12
15	5,23	6,26	7,26	25,00	27,49	30,58	37,70
16	5,81	6,91	7,96	26,33	28,85	32,00	39,25
17	6,41	7,56	8,67	27,59	30,19	33,41	40,79
18	7,01	8,23	9,39	28,87	31,53	34,81	42,31
19	7,63	8,91	10,12	30,14	32,85	36,19	43,82
20	8,26	9,59	10,85	31,41	34,17	37,57	45,31
21	8,90	10,28	11,59	32,67	35,48	38,93	46,80
22	9,54	10,98	12,34	33,92	36,78	40,29	48,27
23	10,20	11,69	13,09	35,17	38,08	41,64	49,73
24	10,86	12,40	13,85	36,42	39,36	42,98	51,18
25	11,52	13,12	14,61	37,65	40,65	44,31	52,62
26	12,20	13,84	15,38	38,89	41,92	45,64	54,05
27	12,88	14,57	16,15	40,11	43,19	46,96	55,48
28	13,56	15,31	16,93	41,34	44,46	48,28	56,89
29	14,26	16,05	17,71	42,56	45,72	49,59	58,30
30	14,95	16,79	18,49	43,77	46,98	50,89	59,70
31	15,66	17,54	19,28	44,99	48,23	52,19	61,10
32	16,36	18,29	20,07	46,19	49,48	53,49	62,49
33	17,07	19,05	20,87	47,40	50,73	54,78	63,87
34	17,79	19,81	21,66	48,60	51,97	56,06	65,25
35	18,51	20,57	22,47	49,80	53,20	57,34	66,62
40	22,16	24,43	26,51	55,76	59,34	63,69	73,40
50	29,71	32,36	34,76	67,51	71,42	76,15	86,66
60	37,48	40,48	43,19	79,08	83,30	88,38	99,61
100	70,06	74,22	77,93	124,3	129,5	135,8	149,4

Ab Geburt bis zum 36-ten Monat: Jungen
Körperlänge - Alter und Körpermasse - Alter Perzentile



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SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

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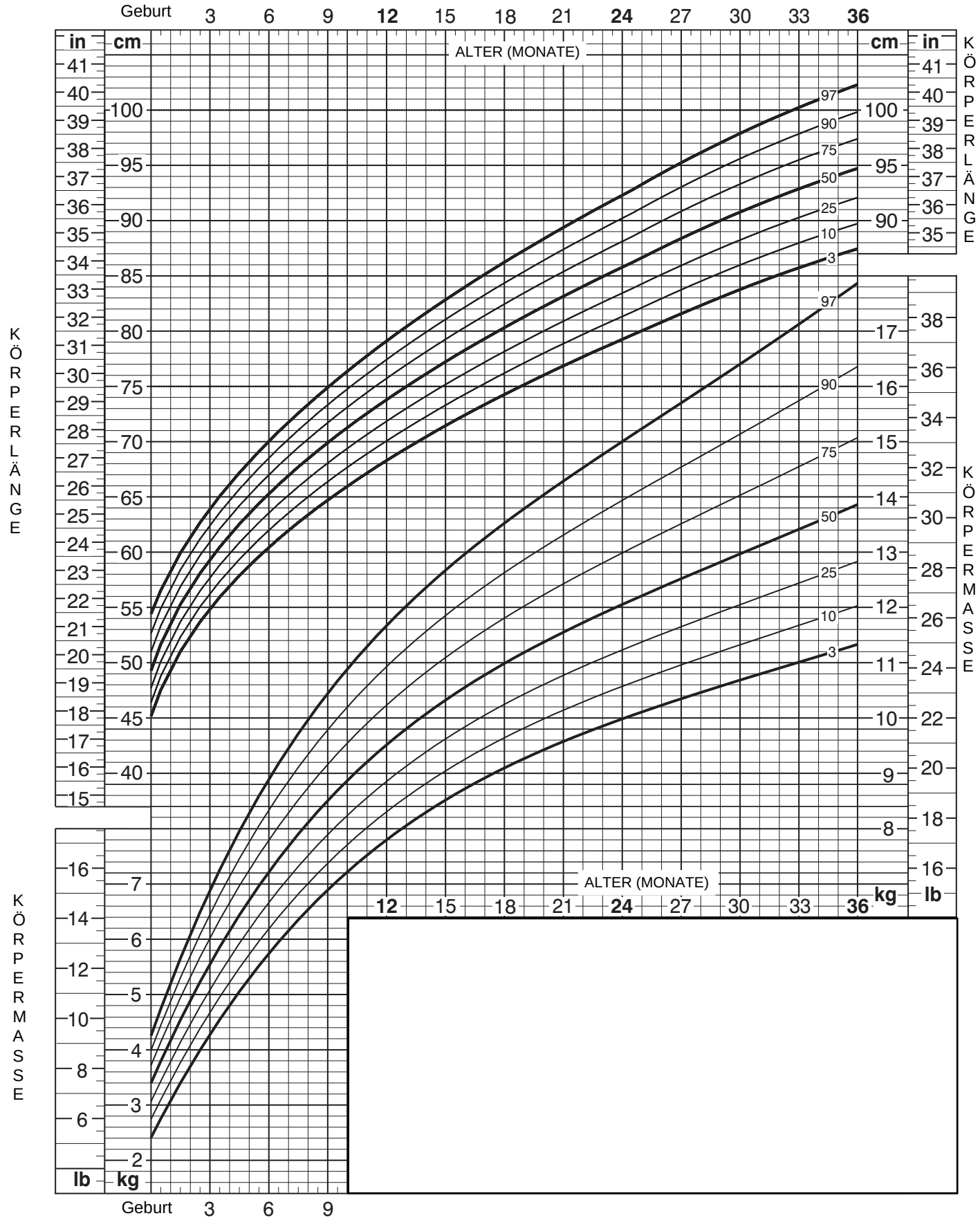
Ab Geburt bis zum 36-ten Monat: Mädchen
Körperlänge - Alter und Körpermasse - Alter Perzentile



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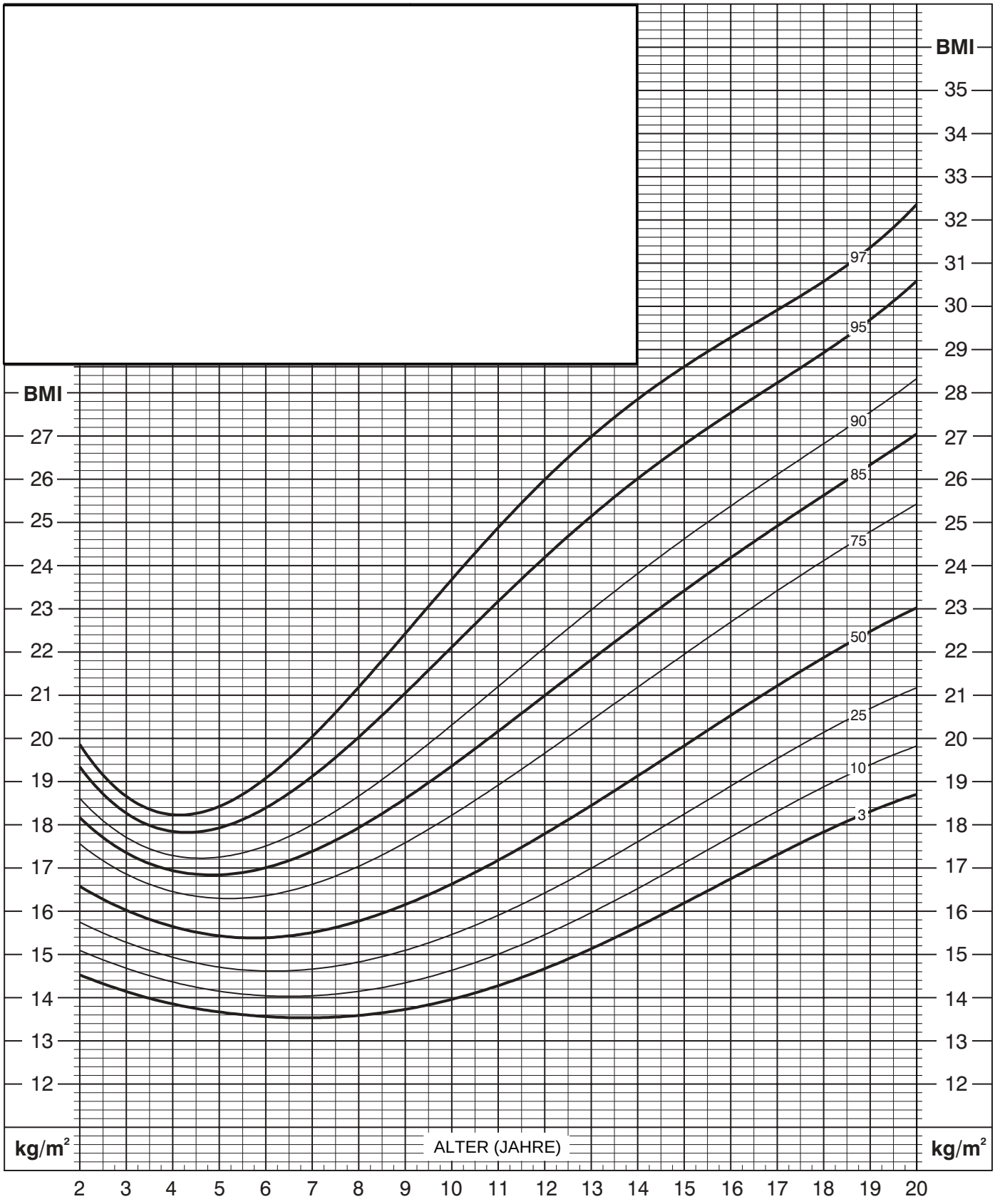
Ab dem 2. bis zum 20. Lebensjahr: Jungen
Körpermasseindex (BMI) - Alter Perzentile



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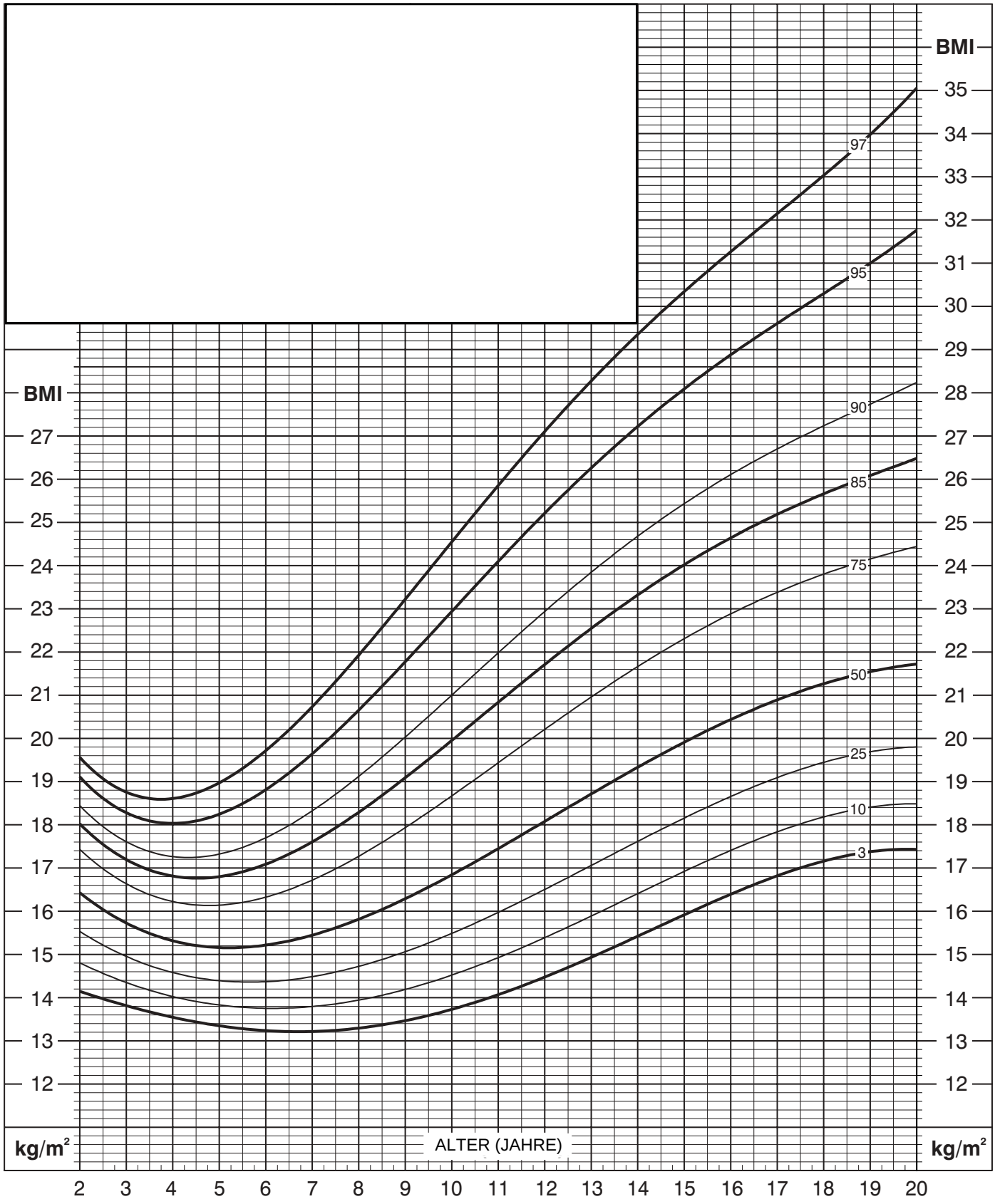
Ab dem 2. bis zum 20. Lebensjahr: Mädchen
Körpermasseindex (BMI) - Alter Perzentile



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