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Influence of sex, age, pubertal maturation and body mass index on circulating white blood cell counts in healthy European adolescents—the HELENA study

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Supplementary table 1. Relative values (%) of white blood cell types in European adolescents, according to age categories and stratified for sex.

		Boys					Girls				
Age range (years)		12.5-13.9	14-14.9	15-15.9	16-17.5		12.5-13.9	14-14.9	15-15.9	16-17.5	
N		48	55	46	49	R	56	48	63	40	R
Neutrophils	10th	**40.2**§§	**39.1**§§	**42.3**	**44.3**§	**0.255****	43.6§§	43.0§§	43.1	49.1§	0.123
	25th	**44.0**§§	**44.9**§§	**48.3**	**47.2**§		47.7§§	49.0§§	48.3	55.8§	
	50th	**49.6**§§	**49.4**§§	**51.3**	**53.1**§		54.5§§	55.9§§	56.6	58.6§	
	75th	**55.5**§§	**54.5**§§	**60.4**	**59.2**§		61.3§§	61.7§§	63.8	60.6§	
	90th	**60.0**§§	**59.1**§§	**65.2**	**65.2**§		67.5§§	71.2§§	67.4	66.3§	
Lymphocytes	10th	**29.2**§§	**27.9**§	**25.9**	**25.0**§	**–0.265****	23.8§§	19.6§	21.8	24.0§	-0.106
	25th	**34.2**§§	**32.9**§	**27.8**	**31.5**§		29.5§§	29.6§	26.0	28.6§	
	50th	**39.0**§§	**38.0**§	**36.7**	**35.3**§		34.0§§	33.6§	32.7	32.6§	
	75th	**44.9**§§	**42.5**§	**40.3**	**40.9**§		40.5§§	40.2§	39.3	34.3§	
	90th	**48.0**§§	**46.3**§	**42.3**	**44.4**§		44.5§§	46.9§	44.2	37.9§	
Monocytes	10th	5.4	5.9§§	5.1	5.3	–0.006	5.0	4.8§§	5.3	4.9	-0.020
	25th	6.4	6.6§§	6.3	6.1		6.3	5.4§§	6.4	5.6	
	50th	7.8	8.3§§	7.9	7.8		7.5	7.0§§	7.5	6.7	
	75th	8.8	9.7§§	9.4	9.1		8.9	8.4§§	8.8	8.6	
	90th	10.2	10.6§§	11.0	10.7		10.5	9.9§§	10.0	10.0	
Eosinophils	10th	1.1	1.4§§	0.8	1.1	–0.089	0.8	0.7§§	0.9	0.7	–0.080
	25th	1.7	2.0§§	1.2	1.8		1.4	1.0§§	1.2	1.1	
	50th	2.3	3.0§§	2.5	2.5		2.3	2.0§§	1.9	2.1	
	75th	3.0	4.0§§	3.7	3.2		3.7	3.1§§	2.8	2.9	
	90th	5.2	6.1§§	6.7	5.0		6.1	4.2§§	5.0	4.0	
Basophils	10th	0.1	0.2	0.2	0.2	–0.060	0.1	0.1	0.2	0.2	–0.072
	25th	0.4	0.2	0.3	0.3		0.3	0.2	0.3	0.3	
	50th	0.6	0.5	0.4	0.5		0.5	0.4	0.5	0.4	
	75th	0.8	0.9	0.7	0.7		0.7	0.8	0.8	0.6	
	90th	1.0	1.2	0.9	1.0		1.0	1.0	1.1	1.0	

Data are presented as percentiles 10th, 25th, 50th (median), 75th, and 90th. §Significant differences between boys and girls for a given age category, as assessed by the Mann-Whitney U test; §P<0.05, §§P<0.01. R is the partial correlation coefficient between cell counts and age, controlling for centre; bold rows indicate significant correlations,*P<0.05, **P<0.01.

Supplementary table 2. Relative counts (%) of selected lymphocyte subsets in European adolescents, according to age and stratified for sex.

		Boys					Girls				
Age range (years)		12.5-13.9	14-14.9	15-15.9	16-17.5		12.5-13.9	14-14.9	15-15.9	16-17.5	
N		36	49	41	45	R	39	42	50	26	R
$CD45^+CD3^+$	10^{th}	58.1	59.6	58.8§	57.5	0.019	58.0	59.0	62.1§	62.7	0.116
	25^{th}	64.3	63.3	63.4§	63.8		62.8	63.5	67.9§	65.9	
	50^{th}	68.3	67.9	68.8§	67.5		68.3	70.5	71.6§	70.5	
	75^{th}	73.1	72.4	73.3§	73.6		74.5	74.2	74.9§	76.7	
	90^{th}	74.9	76.6	77.3§	75.8		76.8	76.3	79.6§	80.1	
$CD45^+CD4^+$	10^{th}	30.8	30.0	31.4§§	25.9	0.012	**31.2**	**29.3**	**32.5§§**	**30.8**	**0.170***
	25^{th}	33.6	33.6	34.3§§	33.3		**33.7**	**33.9**	**36.3§§**	**35.7**	
	50^{th}	36.1	38.2	37.4§§	38.0		**37.7**	**36.2**	**40.1§§**	**40.0**	
	75^{th}	38.7	41.8	39.3§§	41.7		**40.7**	**41.1**	**45.2§§**	**46.2**	
	90^{th}	45.5	45.3	43.4§§	42.9		**43.6**	**44.1**	**47.1§§**	**52.9**	
$CD45^+CD8^+$	10^{th}	18.8	19.2	18.0	16.7	-0.049	19.4	21.4	21.3	18.8	-0.027
	25^{th}	23.2	21.7	21.8	19.7		22.1	22.7	23.2	21.6	
	50^{th}	27.5	26.4	27.6	24.5		26.2	25.4	26.9	25.4	
	75^{th}	30.7	30.6	30.3	30.3		29.7	32.5	30.2	29.1	
	90^{th}	33.3	35.2	34.8	34.3		33.1	36.7	34.5	34.4	
$CD45^+CD3^-CD16^+56^+$	10^{th}	8.4	6.5	8.4	9.3	0.077	7.8	9.6	8.2	6.1	0.007
	25^{th}	12.3	10.9	11.5	13.4		10.0	11.2	11.4	9.0	
	50^{th}	15.1	13.1	14.9	16.9		13.0	15.2	13.4	14.7	
	75^{th}	18.3	18.3	21.1	21.2		18.3	19.0	17.1	20.5	
	90^{th}	22.9	25.3	25.3	25.6		26.1	23.8	21.5	26.5	
$CD45^+CD3^-CD19^+$	10^{th}	**8.4**	**8.1**	**7.7**	**6.8**	**-0.208****	**8.3**	**6.9**	**6.6**	**5.0**	**-0.317****
	25^{th}	**9.4**	**9.8**	**10.1**	**9.0**		**11.3**	**10.1**	**8.7**	**7.1**	
	50^{th}	**12.1**	**13.2**	**12.0**	**11.4**		**14.7**	**11.7**	**10.8**	**9.8**	
	75^{th}	**15.9**	**17.0**	**15.5**	**13.0**		**16.5**	**14.8**	**13.2**	**13.1**	
	90^{th}	**19.9**	**21.3**	**17.9**	**15.1**		**20.3**	**18.1**	**16.0**	**15.5**	
$CD3^+CD45RA^+$	10^{th}	**50.3**	**51.2§§**	**41.9**	**46.5§**	**-0.180***	**48.2**	**46.5§§**	**44.7**	**44.6§**	**-0.217****
	25^{th}	**57.1**	**58.9§§**	**54.4**	**52.1§**		**55.8**	**52.3§§**	**52.7**	**50.9§**	
	50^{th}	**62.3**	**63.5§§**	**59.1**	**60.0§**		**60.2**	**55.8§§**	**58.6**	**54.5§**	
	75^{th}	**67.9**	**69.1§§**	**66.9**	**63.2§**		**68.1**	**62.3§§**	**64.4**	**58.3§**	
	90^{th}	**70.5**	**72.9§§**	**70.0**	**68.9§**		**73.5**	**69.8§§**	**66.9**	**61.8§**	
$CD3^+CD45RO^+$	10^{th}	**29.0**	**27.6§§**	**28.7**	**30.6§**	**0.198***	**26.5**	**30.2§§**	**32.5**	**37.7§**	**0.242****
	25^{th}	**31.6**	**30.7§§**	**31.8**	**36.0§**		**30.8**	**37.5§§**	**35.4**	**41.6§**	
	50^{th}	**36.4**	**34.6§§**	**40.2**	**39.9§**		**39.1**	**43.8§§**	**40.4**	**45.2§**	
	75^{th}	**42.0**	**39.7§§**	**45.5**	**45.8§**		**44.4**	**47.4§§**	**46.2**	**49.9§**	
	90^{th}	**50.0**	**47.8§§**	**57.1**	**53.2§**		**49.9**	**51.7§§**	**52.6**	**55.3§**	

$CD4^+CD45RA^+$	10^{th}	**45.2**	**46.9§§**	**43.0**	**39.5**	**-0.203****	**47.8**	**39.7§§**	**40.1**	**38.4**	**-0.292****
	25^{th}	**53.3**	**53.1§§**	**49.1**	**45.8**		**54.4**	**48.1§§**	**48.3**	**41.4**	
	50^{th}	**60.2**	**62.2§§**	**56.1**	**54.5**		**61.1**	**55.9§§**	**55.4**	**50.5**	
	75^{th}	**64.6**	**66.7§§**	**60.7**	**60.3**		**67.0**	**61.4§§**	**62.1**	**56.0**	
	90^{th}	**71.2**	**71.9§§**	**68.7**	**67.1**		**71.6**	**68.7§§**	**66.1**	**59.8**	
$CD4^+CD45RO^+$	10^{th}	**28.4**	**27.8§§**	**30.6**	**32.7**	**0.203****	**27.7**	**31.3§§**	**32.1**	**38.6**	**0.292****
	25^{th}	**35.4**	**33.1§§**	**37.1**	**39.6**		**32.6**	**38.6§§**	**38.0**	**44.0**	
	50^{th}	**39.6**	**37.7§§**	**43.9**	**44.8**		**37.2**	**44.0§§**	**43.7**	**49.3**	
	75^{th}	**46.5**	**46.7§§**	**50.8**	**53.3**		**45.8**	**51.8§§**	**51.7**	**58.6**	
	90^{th}	**55.3**	**53.3§§**	**55.9**	**60.5**		**52.6**	**59.8§§**	**59.1**	**61.6**	
$CD8^+CD45RA^+$	10^{th}	57.5	60.0§§	56.7	51.6	-0.114	51.0	46.8§§	54.5	55.8	-0.028
	25^{th}	63.3	68.3§§	66.0	55.4		62.9	59.5§§	61.6	61.5	
	50^{th}	71.9	71.5§§	70.2	68.4		69.9	66.0§§	69.2	67.0	
	75^{th}	77.8	80.4§§	79.2	74.1		77.1	72.4§§	75.4	70.0	
	90^{th}	83.2	84.0§§	81.0	83.6		83.5	79.0§§	79.5	77.1	
$CD8^+CD45RO^+$	10^{th}	16.5	15.2§§	18.0	15.6	0.099	16.8	20.9§§	19.4	22.9	0.033
	25^{th}	22.3	19.5§§	20.7	24.3		22.7	27.6§§	24.4	30.0	
	50^{th}	27.2	28.0§§	29.4	31.6		29.5	33.7§§	30.8	32.7	
	75^{th}	34.5	31.3§§	33.4	44.4		37.2	40.1§§	38.7	38.4	
	90^{th}	42.1	39.9§§	43.3	47.3		49.2	52.4§§	45.5	44.2	

Data are presented as percentiles 10^{th}, 25^{th}, 50^{th} (median), 75^{th}, and 90^{th}. Lymphocyte populations are designated by their cell markers, and defined by the anchor marker, which appears in first place of the subset name. § Significant differences between sexes for a given age category, as assessed by the Mann-Whitney U test; $^{§}P<0.05$, $^{§§}P<0.01$. R is the partial correlation coefficient between cell percentages and age, controlling for centre; bold rows indicate significant correlations,*$P<0.05$, **$P<0.01$.

Supplementary table 3. Relative values (%) of white blood cell types in European adolescents, according to Tanner stages and stratified for sex.

		Boys					Girls				
Tanner stage		I+II	III	IV	V		I+II	III	IV	V	
N		12	34	77	55	*P*	7	26	97	60	*P*
Neutrophils	10th	29.2	40.2	40.4	45.0	0.165	32.8	38.4	43.3	45.9	0.128
	25th	43.3	43.0	44.4	48.4		36.4	44.6	48.7	51.7	
	50th	49.4	52.1	49.4	52.3		48.5	55.1	56.7	56.7	
	75th	53.0	57.1	56.3	60.7		53.8	66.2	61.6	61.4	
	90th	63.4	63.8	60.3	68.9		-	72.0	66.6	66.6	
Lymphocytes	10th	**27.3**	**25.6**	**29.8**	**22.9**	**0.026**	27.0	18.7	23.9	22.5	0.288
	25th	**35.4**	**31.4**	**33.2**	**27.1**		31.3	25.7	28.9	28.9	
	50th	**38.3**	**38.4**	**39.9**	**35.3**		38.4	33.9	33.5	33.2	
	75th	**46.3**	**44.0**	**43.5**	**39.7**		46.9	39.7	39.2	37.2	
	90th	**61.8**	**47.2**	**46.8**	**42.3**		-	46.1	44.3	42.3	
Monocytes	10th	4.9	5.3	5.4	5.5	0.293	4.0	5.0	5.0	4.9	0.194
	25th	5.8	6.1	6.1	6.6		7.0	5.9	6.0	5.6	
	50th	8.0	7.1	7.7	7.9		8.3	7.0	7.2	7.1	
	75th	8.9	8.5	9.4	9.1		10.6	8.7	8.8	8.0	
	90th	10.2	11.1	10.5	10.8		-	9.9	10.6	9.1	
Eosinophils	10th	1.4	1.0	1.0	0.9	0.852	1.0	0.8	0.7	1.0	0.099
	25th	2.1	1.9	1.8	1.7		1.4	1.2	1.1	1.5	
	50th	2.9	2.3	2.5	2.6		2.6	2.9	2.0	2.2	
	75th	3.5	3.8	3.6	3.6		3.2	4.7	3.1	3.1	
	90th	5.7	6.8	5.6	5.4		-	9.4	4.1	5.7	
Basophils	10th	0.1	0.0	0.2	0.2	0.582	**0.0**	**0.0**	**0.2**	**0.2**	**0.010**
	25th	0.3	0.2	0.3	0.3		**0.1**	**0.1**	**0.3**	**0.4**	
	50th	0.6	0.4	0.4	0.5		**0.5**	**0.4**	**0.4**	**0.6**	
	75th	0.8	0.9	0.6	0.9		**1.2**	**0.8**	**0.6**	**0.9**	
	90th	1.3	1.2	0.9	1.0		**-**	**1.0**	**0.9**	**1.2**	

Data are presented as percentiles 10th, 25th, 50th (median), 75th, and 90th. Bold rows indicate significant differences between Tanner stages, as assessed by analysis of covariance (ANCOVA), controlling for centre and age, $P<0.05$.

Supplementary table 4. Relative counts (%) of selected lymphocyte subsets in European adolescents, according to Tanner stages and stratified for sex.

		Boys					Girls				
Tanner stage		I+II	III	IV	V		I+II	III	IV	V	
N		9	26	67	52	*P*	7	19	65	55	*P*
$CD45^+CD3^+$	10^{th}	64.3	58.2	60.0	56.0	0.764	55.0	59.4	57.0	60.7	0.138
	25^{th}	64.7	65.0	63.2	63.5		60.4	62.7	64.9	67.9	
	50^{th}	67.8	69.9	67.0	69.2		63.2	68.7	69.8	72.9	
	75^{th}	73.4	73.5	71.6	73.0		72.8	72.5	73.1	76.3	
	90^{th}	-	76.5	75.3	77.2		-	74.5	76.7	79.9	
$CD45^+CD4^+$	10^{th}	31.6	31.7	31.3	28.2	0.520	29.3	31.3	30.7	31.2	0.832
	25^{th}	33.3	33.4	34.8	32.0		32.3	32.8	34.4	34.0	
	50^{th}	35.7	36.9	38.2	37.8		39.6	37.5	38.2	39.6	
	75^{th}	37.1	39.0	41.6	41.7		43.7	40.3	42.7	43.8	
	90^{th}	37.7	43.4	45.2	45.2		-	45.1	46.9	46.6	
$CD45^+CD8^+$	10^{th}	25.6	19.3	17.9	16.8	0.624	18.7	19.3	20.0	21.2	0.087
	25^{th}	26.4	22.3	21.2	20.8		19.7	21.5	22.2	23.2	
	50^{th}	27.6	28.5	25.2	27.0		22.8	26.0	24.5	27.9	
	75^{th}	31.0	31.3	29.1	30.1		28.9	31.3	29.0	33.6	
	90^{th}	32.7	34.8	33.8	37.7		-	36.3	31.7	35.0	
$CD45^+CD3^-CD16^+56^+$	10^{th}	11.1	7.9	7.4	8.6	0.617	6.6	9.7	8.9	7.9	0.417
	25^{th}	11.8	12.1	9.9	12.6		9.6	11.3	11.6	11.1	
	50^{th}	14.9	14.5	15.1	15.2		15.5	13.8	14.7	13.8	
	75^{th}	20.3	18.2	20.7	21.6		23.6	17.4	19.4	18.2	
	90^{th}	-	24.4	25.0	28.4		-	26.2	24.1	22.0	
$CD45^+CD3^-CD19^+$	10^{th}	7.8	8.5	7.6	6.8	0.453	7.0	7.3	7.0	6.6	0.378
	25^{th}	9.7	10.0	9.7	9.2		10.6	9.5	9.9	7.6	
	50^{th}	10.5	12.2	12.2	11.8		14.7	14.1	11.8	10.7	
	75^{th}	13.4	15.0	15.4	15.5		19.1	16.8	15.2	14.0	
	90^{th}	-	19.8	21.0	16.8		-	17.6	18.0	18.2	
$CD3^+CD45RA^+$	10^{th}	53.2	48.4	47.0	44.3	0.572	57.6	47.4	45.4	46.0	0.145
	25^{th}	58.8	53.6	57.2	56.4		64.1	53.3	53.4	50.6	
	50^{th}	64.9	60.5	61.4	60.3		68.1	62.0	58.6	54.6	
	75^{th}	69.9	65.4	67.6	68.0		71.7	70.9	64.3	61.6	
	90^{th}	73.4	69.1	69.8	70.9		-	72.4	66.9	66.4	
$CD3^+CD45RO^+$	10^{th}	26.8	30.6	29.1	28.5	0.406	25.1	27.3	32.3	34.9	0.149
	25^{th}	30.1	33.3	31.6	31.1		27.3	28.9	35.5	38.3	
	50^{th}	35.1	39.2	37.1	39.5		32.1	37.5	41.3	44.3	
	75^{th}	41.2	46.3	41.7	43.5		36.1	46.4	46.4	48.5	
	90^{th}	43.9	51.9	52.6	55.5		-	52.4	53.0	52.0	

$CD4^+CD45RA^+$	10^{th}	43.0	45.5	39.7	43.3	0.753	61.1	48.6	39.5	38.9	0.117
	25^{th}	58.6	47.1	52.8	51.1		62.1	55.3	48.7	46.7	
	50^{th}	61.5	54.9	57.5	55.9		64.7	60.8	57.4	52.8	
	75^{th}	67.4	63.7	66.0	63.2		68.3	69.1	62.4	58.6	
	90^{th}	71.2	71.8	71.1	69.3		-	71.2	67.4	65.7	
$CD4^+CD45RO^+$	10^{th}	28.7	28.6	28.4	30.6	0.596	25.3	28.6	31.0	34.0	0.143
	25^{th}	33.1	36.2	33.4	36.7		31.7	30.8	37.5	41.3	
	50^{th}	38.5	45.3	41.3	44.0		35.4	37.5	41.9	47.2	
	75^{th}	41.9	52.7	47.1	48.6		37.2	44.7	51.3	53.4	
	90^{th}	58.6	54.3	60.3	55.9		-	51.4	60.2	61.1	
$CD8^+CD45RA^+$	10^{th}	65.9	58.6	55.2	50.5	0.625	46.9	52.0	53.2	54.4	0.349
	25^{th}	66.8	63.9	65.6	62.7		69.8	60.4	62.0	60.4	
	50^{th}	76.7	70.1	69.9	71.6		75.8	67.5	67.7	65.3	
	75^{th}	82.2	75.3	77.3	79.5		84.3	77.0	73.5	72.8	
	90^{th}	-	80.6	82.4	85.1		-	84.5	79.9	79.5	
$CD8^+CD45RO^+$	10^{th}	14.1	19.6	17.1	14.6	0.387	10.3	15.4	19.1	20.5	0.298
	25^{th}	17.8	24.4	22.3	19.8		15.3	22.8	26.5	26.9	
	50^{th}	24.7	30.0	28.5	27.8		25.0	33.0	31.2	34.1	
	75^{th}	33.0	35.7	33.3	37.2		30.6	39.8	37.2	39.4	
	90^{th}	-	41.3	44.9	47.5		-	48.1	45.5	45.5	

Data are presented as percentiles 10^{th}, 25^{th}, 50^{th} (median), 75^{th}, and 90^{th}. Lymphocyte populations are designated by their cell membrane markers, and defined by the anchor marker, which appears in first place of the subset name. Bold rows indicate significant differences between Tanner stages, as assessed by analysis of covariance (ANCOVA), controlling for age and centre, $P<0.05$.

Supplementary table 5. Relative values (%) of white blood cell types in European adolescents, according to BMI z-scores and stratified for sex.

		Boys						Girls					
BMI z-scores		Q1	Q2	Q3	Q4			Q1	Q2	Q3	Q4		
N		43	42	42	43	*P*	R	41	41	38	39	*P*	R
Neutrophils	10th	41.0	41.4	40.2	44.0	0.337	–0.076	**41.8**	**43.6**	**43.6**	**47.2**	**0.022**	**0.181***
	25th	47.3	45.6	43.2	45.1			**46.7**	**49.2**	**50.5**	**53.4**		
	50th	51.1	51.7	50.0	51.4			**54.0**	**56.5**	**59.1**	**58.3**		
	75th	59.2	57.8	54.5	55.6			**59.0**	**61.0**	**63.3**	**64.7**		
	90th	67.9	61.8	60.9	60.2			**66.5**	**66.3**	**69.2**	**67.5**		
Lymphocytes	10th	23.3	25.6	27.6	29.0	0.204	**0.169***	**24.9**	**23.9**	**22.5**	**21.9**	**0.009**	**–0.185****
	25th	28.7	32.0	30.7	34.3			**31.3**	**29.1**	**26.3**	**25.7**		
	50th	36.3	35.3	38.1	39.1			**34.5**	**33.6**	**30.9**	**32.1**		
	75th	41.7	42.2	42.1	43.5			**43.2**	**40.4**	**36.6**	**36.5**		
	90th	45.9	45.3	46.7	44.7			**46.7**	**44.8**	**42.9**	**40.7**		
Monocytes	10th	5.3	5.8	5.8	5.2	0.467	–0.023	5.3	4.8	5.1	5.0	0.415	–0.110
	25th	6.3	6.6	6.3	6.1			6.2	5.8	6.1	5.7		
	50th	7.5	8.2	8.2	8.0			7.9	7.1	7.6	6.9		
	75th	8.6	9.6	9.6	9.0			8.8	9.0	8.6	7.9		
	90th	10.1	11.0	11.4	9.7			10.6	10.4	9.9	9.7		
Eosinophils	10th	**1.1**	**1.5**	**1.0**	**0.7**	**0.005**	–0.132	1.1	0.9	0.7	0.7	0.568	–0.065
	25th	**1.7**	**2.0**	**2.0**	**1.6**			1.3	1.3	1.0	1.1		
	50th	**2.5**	**2.7**	**3.1**	**2.0**			2.3	2.2	2.0	1.9		
	75th	**3.9**	**3.3**	**5.0**	**2.8**			3.0	3.1	3.3	3.0		
	90th	**4.6**	**5.4**	**9.5**	**3.7**			5.5	4.4	4.2	5.4		
Basophils	10th	0.2	0.2	0.0	0.2	0.212	**–0.161***	0.2	0.2	0.1	0.1	0.436	–0.060
	25th	0.4	0.3	0.2	0.3			0.3	0.3	0.3	0.2		
	50th	0.6	0.4	0.5	0.4			0.5	0.4	0.4	0.5		
	75th	1.0	0.7	0.8	0.6			0.8	0.8	0.7	0.7		
	90th	1.2	1.1	1.0	1.0			1.1	1.0	1.0	1.0		

Data are presented as percentiles 10th, 25th, 50th (median), 75th, and 90th. Bold rows indicate significant differences between quartiles of standardized body mass index (BMI z-scores), as assessed by analysis of covariance (ANCOVA), controlling for centre, $P<0.05$. R is the partial correlation coefficient between cell percentages and BMI z-scores, controlling for centre;*$P<0.05$, **$P<0.01$.

Supplementary table 6. Relative counts (%) of selected lymphocyte subsets in European adolescents, according to BMI z-scores and stratified for sex.

		Boys						Girls					
BMI z-scores		Q1	Q2	Q3	Q4			Q1	Q2	Q3	Q4		
N		43	42	42	43	*P*	R	41	41	38	39	*P*	R
$CD45^+CD3^+$	10^{th}	60.8	59.1	58.0	56.5	0.785	–0.034	57.4	59.3	59.7	62.0	0.191	0.093
	25^{th}	64.4	63.2	62.2	64.6			63.6	67.4	66.0	63.6		
	50^{th}	69.3	68.9	68.0	67.2			70.3	71.5	70.1	71.7		
	75^{th}	73.0	73.1	73.1	73.4			72.9	75.7	74.2	76.3		
	90^{th}	77.1	76.0	76.2	75.7			76.0	79.5	76.5	79.7		
$CD45^+CD4^+$	10^{th}	28.0	32.2	30.3	29.1	0.150	**–0.154***	29.3	32.7	31.5	31.3	0.322	0.152
	25^{th}	34.5	35.0	33.3	32.6			33.0	35.2	35.6	35.8		
	50^{th}	39.0	37.4	36.7	36.7			37.2	37.6	39.2	39.4		
	75^{th}	43.5	40.6	39.0	39.4			42.1	43.4	42.6	43.7		
	90^{th}	46.5	45.7	42.2	42.8			47.2	46.8	45.8	47.7		
$CD45^+CD8^+$	10^{th}	16.8	17.3	17.8	18.9	0.685	0.114	19.3	21.0	20.6	21.2	0.990	–0.006
	25^{th}	20.6	20.2	22.7	22.7			21.6	23.1	22.9	22.2		
	50^{th}	24.2	26.9	26.1	27.6			25.6	25.8	26.7	26.2		
	75^{th}	30.3	29.4	28.9	32.5			31.9	30.0	29.4	30.6		
	90^{th}	35.6	33.8	32.7	35.9			35.2	34.4	32.7	34.7		
$CD45^+CD3^-CD16^+56^+$	10^{th}	9.0	8.1	6.8	8.4	0.569	0.054	6.7	7.9	8.9	8.8	0.874	0.009
	25^{th}	12.0	11.8	10.1	12.1			10.1	11.6	10.8	11.2		
	50^{th}	14.6	15.5	14.3	15.4			14.6	13.9	13.1	14.4		
	75^{th}	18.3	21.3	18.5	20.1			21.2	16.4	17.7	18.8		
	90^{th}	24.2	24.5	24.0	27.2			25.1	21.9	26.1	23.0		
$CD45^+CD3^-CD19^+$	10^{th}	8.0	9.0	7.5	7.6	0.246	0.054	6.6	5.9	8.1	6.7	0.524	–0.067
	25^{th}	9.2	9.8	10.5	10.1			8.7	8.4	10.2	9.1		
	50^{th}	11.7	11.0	13.9	12.1			12.6	10.9	12.4	10.9		
	75^{th}	14.5	13.7	17.8	15.2			15.5	15.2	14.9	13.0		
	90^{th}	16.9	16.3	19.6	19.2			18.3	18.0	17.5	18.1		
$CD3^+CD45RA^+$	10^{th}	50.0	48.5	47.8	44.3	0.064	**–0.156***	45.4	44.9	51.8	45.5	0.135	–0.111
	25^{th}	58.8	56.1	55.7	54.5			51.7	52.1	53.9	50.4		
	50^{th}	64.1	61.2	61.2	59.2			58.6	57.3	60.1	54.7		
	75^{th}	69.3	63.8	67.1	63.7			66.5	64.4	64.8	61.3		
	90^{th}	71.5	69.5	70.4	69.2			70.9	69.7	70.6	64.9		
$CD3^+CD45RO^+$	10^{th}	28.2	29.7	29.0	29.8	0.129	0.142	29.0	29.5	29.3	34.9	0.308	0.089
	25^{th}	30.4	34.1	32.0	35.6			33.5	35.3	34.9	37.6		
	50^{th}	35.6	37.6	38.4	40.1			41.3	41.1	39.3	44.1		
	75^{th}	41.1	43.3	44.3	44.7			48.3	46.8	46.2	47.5		
	90^{th}	49.9	51.5	51.9	55.6			54.5	53.3	48.9	52.2		

$CD4^+CD45RA^+$	10^{th}	**44.5**	**44.8**	**42.5**	**41.3**	**0.043**	**–0.183***	41.0	42.6	39.5	38.9	0.103	–0.147
	25^{th}	**53.4**	**51.8**	**51.4**	**46.4**			51.2	48.7	48.6	43.3		
	50^{th}	**60.4**	**56.4**	**58.2**	**55.4**			55.9	56.5	57.0	51.6		
	75^{th}	**66.8**	**62.5**	**63.6**	**62.2**			61.8	65.9	63.3	59.3		
	90^{th}	**71.8**	**70.3**	**70.4**	**65.4**			68.1	69.5	67.3	63.5		
$CD4^+CD45RO^+$	10^{th}	**27.3**	**29.1**	**29.5**	**34.2**	**0.036**	**0.192***	31.4	30.2	32.7	36.2	0.090	**0.161***
	25^{th}	**33.0**	**36.1**	**36.5**	**38.1**			37.3	33.9	36.7	39.6		
	50^{th}	**39.4**	**43.4**	**41.1**	**44.1**			43.9	43.5	42.3	48.3		
	75^{th}	**46.3**	**47.8**	**48.6**	**53.5**			48.6	51.1	51.4	56.6		
	90^{th}	**55.3**	**54.4**	**56.7**	**58.8**			58.8	56.9	60.7	61.2		
$CD8^+CD45RA^+$	10^{th}	53.8	58.7	52.9	54.4	0.384	–0.122	**54.6**	**47.8**	**57.0**	**49.7**	**0.042**	–0.062
	25^{th}	68.2	64.4	64.7	64.4			**62.1**	**60.5**	**62.6**	**59.7**		
	50^{th}	72.3	69.5	70.5	69.8			**67.7**	**65.9**	**69.9**	**66.3**		
	75^{th}	80.5	77.3	79.1	76.2			**75.1**	**72.0**	**78.5**	**72.1**		
	90^{th}	83.1	81.5	83.2	84.9			**83.4**	**77.8**	**84.4**	**76.3**		
$CD8^+CD45RO^+$	10^{th}	16.9	17.7	16.4	15.1	0.516	0.106	**16.8**	**21.2**	**15.6**	**23.5**	**0.039**	0.059
	25^{th}	19.5	21.6	20.6	22.4			**24.8**	**28.0**	**21.3**	**27.9**		
	50^{th}	27.4	28.0	29.5	30.0			**32.0**	**33.7**	**30.1**	**33.4**		
	75^{th}	31.3	34.0	35.3	34.5			**37.9**	**39.9**	**36.7**	**40.0**		
	90^{th}	46.2	41.6	47.1	45.6			**45.4**	**52.5**	**42.4**	**50.8**		

Data are presented as percentiles 10^{th}, 25^{th}, 50^{th} (median), 75^{th}, and 90^{th}. Lymphocyte populations are designated by their cell membrane markers, and defined by the anchor marker, which appears in first place of the subset name. Bold rows indicate significant differences between quartiles of standardized body mass index (BMI z-scores), as assessed by analysis of covariance (ANCOVA), controlling for centre, $P<0.05$. R is the partial correlation coefficient between cell percentages and BMI z-scores, controlling for centre; *$P<0.05$, **$P<0.01$.