

**BULGARIA**

Last Updated: 2006-02-14

Level	Date	Region and sample descriptor	Sex	Age (years)	Sample size	Haemoglobin (g/L)						Mean	SD	Method	Reference	Notes	
						Proportion (%) of population with haemoglobin below:										General	Line
						70	100	110	115	120	130						
N	1999	Children: Total	B	0.00- 3.99	449			32.3				109	16	A	3347	*	1
		Children by age	B	0.00- 0.49	107			52.3				111					
		Children by age	B	0.50- 0.99	61			45.9				115					
		Children by age	B	1.00- 1.99	153			28.1				123					
		Children by age	B	2.00- 3.99	120			15.0				116					
L	1997	Varna: Pre-SAC by sex	F	1.00- 1.07	50			28.0				115	A	4136a	*	2	
		Varna: Pre-SAC by sex	M	1.00- 1.07	56			33.9				116					
L	1996	Varna: Pre-SAC by sex	F	1.00- 1.07	86			22.1				116	A	4136b	*	4	
		Varna: Pre-SAC by sex	M	1.00- 1.07	95			17.9				117					
L	1995 -1997	Varna: Pre-SAC by sex and age	F	1.00- 1.07	110			20.0				118	A	4136c	*	6	
		Varna: Pre-SAC by sex and age	M	1.00- 1.07	102			23.5				116					
		Varna: Pre-SAC by sex and age	F	3.00- 3.07	110			6.4				122					
		Varna: Pre-SAC by sex and age	M	3.00- 3.07	102			5.9				121					
L	1994 -1996	Varna: Pre-SAC by sex and age	F	1.00- 1.07	95			15.8				118	A	4136d	*	10	
		Varna: Pre-SAC by sex and age	M	1.00- 1.07	103			20.4				118					
		Varna: Pre-SAC by sex and age	F	3.00- 3.07	95			4.2				123					
		Varna: Pre-SAC by sex and age	M	3.00- 3.07	103			2.9				123					
L	1993 -1995	Varna: Pre-SAC by sex and age	F	1.00- 1.07	109			10.1				119	A	4136e	*	14	
		Varna: Pre-SAC by sex and age	M	1.00- 1.07	109			22.0				116					
		Varna: Pre-SAC by sex and age	F	3.00- 3.07	109			3.7				124					
		Varna: Pre-SAC by sex and age	M	3.00- 3.07	109			11.0				123					
L	1993	Sofia: PW	F	17.00- 35.99	317	0.0		17.0					NS	3351	*	18	
L	1992 -1994	Varna: Pre-SAC by sex and age	F	1.00- 1.07	109			16.5				118	A	4136f	*	19	
		Varna: Pre-SAC by sex and age	M	1.00- 1.07	109			29.4				114					
		Varna: Pre-SAC by sex and age	F	3.00- 3.07	109			12.8				124					
		Varna: Pre-SAC by sex and age	M	3.00- 3.07	109			7.3				123					
L	1991 -1993	Varna: Pre-SAC by sex and age	F	1.00- 1.07	91			14.3				119	A	4136g	*	23	
		Varna: Pre-SAC by sex and age	M	1.00- 1.07	109			23.9				116					

**BULGARIA**
**Last Updated: 2006-02-14**

Level	Date	Region and sample descriptor	Sex	Age (years)	Sample size	Haemoglobin (g/L)						Mean	SD	Method	Reference	Notes	
						Proportion (%) of population with haemoglobin below:										General	Line
						70	100	110	115	120	130						
L	1991 -1993	Varna: Pre-SAC by sex and age	F	3.00- 3.07	91			6.6				124	A	4136g		25	
		Varna: Pre-SAC by sex and age	M	3.00- 3.07	109			5.5				123				26	
L	1990 -1992	Varna: Pre-SAC by sex and age	F	1.00- 1.07	100			10.0				122	A	4136h	*	27	
		Varna: Pre-SAC by sex and age	M	1.00- 1.07	90			7.8				120				28	
		Varna: Pre-SAC by sex and age	F	3.00- 3.07	100			4.0				124				29	
		Varna: Pre-SAC by sex and age	M	3.00- 3.07	90			10.0				124				30	
L	1989 -1991	Varna: Pre-SAC by sex and age	F	1.00- 1.07	84			8.3				121	A	4136i	*	31	
		Varna: Pre-SAC by sex and age	M	1.00- 1.07	84			13.1				119				32	
		Varna: Pre-SAC by sex and age	F	3.00- 3.07	84			3.6				126				33	
		Varna: Pre-SAC by sex and age	M	3.00- 3.07	84			2.8				125				34	
L	1988 -1990	Varna: Pre-SAC by sex and age	F	1.00- 1.07	88			2.3				121	A	4136j	*	35	
		Varna: Pre-SAC by sex and age	M	1.00- 1.07	105			10.5				122				36	
		Varna: Pre-SAC by sex and age	F	3.00- 3.07	88			0.0				127				37	
		Varna: Pre-SAC by sex and age	M	3.00- 3.07	105			2.9				125				38	
L	1979 P	Plovdiv: Pre-SAC	B	1.00- 3.99	200							NS	994	*	39		
L	1973 P	Burgas town: NPW	F	NS- 40.99	200						115	12	D	3660	*		
		Burgas town: PW by gestational age: <=10 wks	F	NS- 40.99	100						111	13					
		Burgas town: PW by gestational age: 2nd and 3rd tri	F	NS- 40.99	100						101	12					
D	1973 P	Burgas District: PW: Total	F	NS	1339								D	3661	*	40	
		Burgas District: PW by age	F	NS- 20.99	344											41	
		Burgas District: PW by age	F	21.00- 30.99	866											42	
		Burgas District: PW by age	F	31.00- 40.99	126											43	
		Burgas District: PW by age	F	41.00-NS	3											44	
		Burgas District: PW by pregnancy number: 1	F	NS	644											45	
		Burgas District: PW by pregnancy number: 2	F	NS	559											46	
		Burgas District: PW by pregnancy number: 3	F	NS	99											47	
		Burgas District: PW by pregnancy number: >=4	F	NS	37											48	

## NOTES

### BULGARIA

---

**Reference No:** 3347

**General Notes:** *Facility based study (8 social institutions named 'mother and child'); sampling: two-stage cluster sampling (1. 8 out of all 32 institutions were selected; 2. children were selected with probability proportionate to size); sample national representative for institutionalized children.*

**Line note 1** 233 boys and 216 girls.

**Reference No:** 4136a

**General Notes:** *Facility based study (clinic); part of a retrospective survey for a 10-yr period covering healthy children born between 1987 and 1996 in the town of Varna; methodology and results translated by a Bulgarian colleague; sampling: design not explained; Hb determination at the age of 1 yr during health visits in a clinic (for vaccination and preventive check-ups); inclusion only of healthy children; values for other Hb cut-off levels.*

**Line note 2** Standard error mean: 1.5 g/L.

**Line note 3** Standard error mean: 1.6 g/L.

**Reference No:** 4136b

**General Notes:** *Facility based study (clinic); part of a retrospective survey for a 10-yr period covering healthy children born between 1987 and 1996 in the town of Varna; methodology and results translated by a Bulgarian colleague; sampling: design not explained; Hb determination at the age of 1 yr during health visits in a clinic (for vaccination and preventive check-ups); inclusion only of healthy children; values for other Hb cut-off levels.*

**Line note 4** Standard error mean: 0.9 g/L.

**Line note 5** Standard error mean: 1.0 g/L.

**Reference No:** 4136c

**General Notes:** *Facility based study (clinic); part of a retrospective survey for a 10-yr period covering healthy children born between 1987 and 1996 in the town of Varna; methodology and results translated by a Bulgarian colleague; sampling: design not explained; Hb determination at the age of both 1 and 3 yrs during health visits in a clinic (for vaccination and preventive check-ups); inclusion only of healthy children; values for other Hb cut-off levels.*

**Line note 6** Screening year: 1995; standard error mean: 0.9 g/L.

**Line note 7** Screening year: 1995; standard error mean: 1.0 g/L.

**Line note 8** Screening year: 1997; standard error mean: 0.8 g/L.

**Line note 9** Screening year: 1997; standard error mean: 0.9 g/L.

**Reference No:** 4136d

**General Notes:** *Facility based study (clinic); part of a retrospective survey for a 10-yr period covering healthy children born between 1987 and 1996 in the town of Varna; methodology and results translated by a Bulgarian colleague; sampling: design not explained; Hb determination at the age of both 1 and 3 yrs during health visits in a clinic (for vaccination and preventive check-ups); inclusion only of healthy children; values for other Hb cut-off levels.*

**Line note 10** Screening year: 1994; standard error mean: 1.0 g/L.

**Line note 11** Screening year: 1994; standard error mean: 1.0 g/L.

**Line note 12** Screening year: 1996; standard error mean: 1.0 g/L.

**Line note 13** Screening year: 1996; standard error mean: 0.9 g/L.

**Reference No:** 4136e

**General Notes:** *Facility based study (clinic); part of a retrospective survey for a 10-yr period covering healthy children born between 1987 and 1996 in the town of Varna; methodology and results translated by a Bulgarian colleague; sampling: design not explained; Hb determination at the age of both 1 and 3 yrs during health visits in a clinic (for vaccination and preventive check-ups); inclusion only of healthy children; values for other Hb cut-off levels.*

**Line note 14** Screening year: 1993; standard error mean: 0.9 g/L.

**Line note 15** Screening year: 1993; standard error mean: 0.9 g/L.

**Line note 16** Screening year: 1995; standard error mean: 0.9 g/L.

**Line note 17** Screening year: 1995; standard error mean: 1.0 g/L.

**Reference No:** 3351

**General Notes:** *Facility based study (primary health care consultation); PW 1st and 3rd trimester; methodology and results translated by Ministry of Health.*

**Line note 18** Mean age 24.8 yrs.

**Reference No:** 4136f

**General Notes:** *Facility based study (clinic); part of a retrospective survey for a 10-yr period covering healthy children born between 1987 and 1996 in the town of Varna; methodology and results translated by a Bulgarian colleague; sampling: design not explained; Hb determination at the age of both 1 and 3 yrs during health visits in a clinic (for vaccination and preventive check-ups); inclusion only of healthy children; values for other Hb cut-off levels.*

**Line note 19** Screening year: 1992; standard error mean: 0.9 g/L.

**Line note 20** Screening year: 1992; standard error mean: 0.9 g/L.

**Line note 21** Screening year: 1994; standard error mean: 1.0 g/L.

**Line note 22** Screening year: 1994; standard error mean: 0.9 g/L.

**Reference No:** 4136g

**General Notes:** *Facility based study (clinic); part of a retrospective survey for a 10-yr period covering healthy children born between 1987 and 1996 in the town of Varna; methodology and results translated by a Bulgarian colleague; sampling: design not explained; Hb determination at the age of both 1 and 3 yrs during health visits in a clinic (for vaccination and preventive check-ups); inclusion only of healthy children; values for other Hb cut-off levels.*

**Line note 23** Screening year: 1991; standard error mean: 1.0 g/L.

**Line note 24** Screening year: 1991; standard error mean: 1.1 g/L.

**Line note 25** Screening year: 1993; standard error mean: 1.0 g/L.

**Line note 26** Screening year: 1993; standard error mean: 1.0 g/L.

**Reference No:** 4136h

**General Notes:** *Facility based study (clinic); part of a retrospective survey for a 10-yr period covering healthy children born between 1987 and 1996 in the town of Varna; methodology and results translated by a Bulgarian colleague; sampling: design not explained; Hb determination at the age of both 1 and 3 yrs during health visits in a clinic (for vaccination and preventive check-ups); inclusion only of healthy children; values for other Hb cut-off levels.*

**Line note 27** Screening year: 1990; standard error mean: 0.9 g/L.

**Line note 28** Screening year: 1990; standard error mean: 1.0 g/L.

**Line note 29** Screening year: 1992; standard error mean: 0.9 g/L.

**Line note 30** Screening year: 1992; standard error mean: 1.1 g/L.

**Reference No:** 4136i

**General Notes:** *Facility based study (clinic); part of a retrospective survey for a 10-yr period covering healthy children born between 1987 and 1996 in the town of Varna; methodology and results translated by a Bulgarian colleague; sampling: design not explained; Hb determination at the age of both 1 and 3 yrs during health visits in a clinic (for vaccination and preventive check-ups); inclusion only of healthy children; values for other Hb cut-off levels.*

**Line note 31** Screening year: 1989; standard error mean: 1.0 g/L.

- Line note 32** Screening year: 1989; standard error mean: 0.9 g/L.  
**Line note 33** Screening year: 1991; standard error mean: 1.0 g/L.  
**Line note 34** Screening year: 1991; standard error mean: 1.0 g/L.

**Reference No:** 4136j

**General Notes:** *Facility based study (clinic); part of a retrospective survey for a 10-yr period covering healthy children born between 1987 and 1996 in the town of Varna; methodology and results translated by a Bulgarian colleague; sampling: design not explained; Hb determination at the age of both 1 and 3 yrs during health visits in a clinic (for vaccination and preventive check-ups); inclusion only of healthy children; values for other Hb cut-off levels.*

- Line note 35** Screening year: 1988; standard error mean: 0.8 g/L.  
**Line note 36** Screening year: 1988; standard error mean: 1.0 g/L.  
**Line note 37** Screening year: 1990; standard error mean: 0.9 g/L.  
**Line note 38** Screening year: 1990; standard error mean: 0.9 g/L.

**Reference No:** 994

**General Notes:** *Partly facility based study (crèches); sampling: design not explained, half of the sample were reared in domiciliary conditions and the remainder in weekly crèches; inclusion only of subjects with no account of any type of chronic disease and free of acute infections over the last 2 months; Hb cut-off level not according to WHO recommendations (please see 'Key to the data tables').*

- Line note 39** Prevalence of anaemia 11.5% (Hb <94 g/L); prevalence of iron deficiency anaemia 10.0% (Hb <94 g/L+serum iron <600 µg/L+total iron-binding capacity >4000 µg/L).

**Reference No:** 3660

**General Notes:** *Facility based study; method: oxyhaemoglobin method; sampling: design not explained; methodology and results translated by a Bulgarian colleague; only mean Hb values; disaggregated data by age, parity.*

**Reference No:** 3661

**General Notes:** *Facility based study (hospital) for the Region Burgas, Aytos, Karnobat, Grudovo in southeast Bulgaria, for a period of one yr; methodology and results translated by a Bulgarian colleague; method: Sahli method; sampling: design not explained; Hb cut-off level not according to WHO recommendations (please see 'Key to the data tables').*

- Line note 40** Prevalence of anaemia 84.4% (Hb <103 g/L).  
**Line note 41** Prevalence of anaemia 81.7% (Hb <103 g/L).  
**Line note 42** Prevalence of anaemia 87.5% (Hb <103 g/L).  
**Line note 43** Prevalence of anaemia 70.6% (Hb <103 g/L).  
**Line note 44** Prevalence of anaemia 66.7% (Hb <103 g/L).  
**Line note 45** Prevalence of anaemia 85.2% (Hb <103 g/L).  
**Line note 46** Prevalence of anaemia 84.6% (Hb <103 g/L).  
**Line note 47** Prevalence of anaemia 80.8% (Hb <103 g/L).  
**Line note 48** Prevalence of anaemia 75.7% (Hb <103 g/L).

## REFERENCES

### BULGARIA

---

- Reference 994** Marshavelova Y, Stanev I, Zlatarev H. Iron deficiency in children aged 1-3 years. *Folia Medica*, 1979, 21 :48-50.
- Reference 3347** Ivanova L, Angelova K, Duleva V, Vatrlova K, Kostadinova K, Tatjsov T. Strategies for control of micronutrient deficiencies: national survey of institutionalised socially-deprived children aged 0-3 years. Sofia, National Center of Hygiene, Medical Ecology and Nutrition/Bulgarian National Committee for Unicef, 2001.
- Reference 3351** Ivanova L, Pentieva K, Petrova S, Vatrlova K, Angelova K, Lipova M, Iancheva M. Dietary intakes, iron status and anemia prevalence in pregnant women [in Bulgarian]. *Akusherstvo i Ginekologija*, 1995, 34 :6-8.
- Reference 3660** Donchev V. Pregravid hematological profile of women at fertile age in the town of Burgas [in Bulgarian]. *Akusherstvo i Ginekologija*, 1973, 13 :369-380.
- Reference 3661** Donchev V. Distribution of anemia during pregnancy in the district of Burgas [in Bulgarian]. *Akusherstvo i Ginekologija*, 1973, 12 :229-238.
- Reference 4136** Petrova K. Assessment of the risk of iron-deficiency state in one to three year-old children from the town of Varna [in Bulgarian]. *Hygiene and Public Health*, 1998, XLI :25-28.

## ADDITIONAL REFERENCES

### BULGARIA

---

- Reference 255 Baikova D, et al. Nutritional status of young women from Sofia [unpublished summary data]. 1995.
- Reference 3657 Zjekova Kr, Ratchev E, Asparuhova E, Bratoeva J, Lazarova L, Georgieva E, Blagoeva V. Pregnancy, delivery and perinatal outcome with the adolescent pregnant [in Bulgarian]. Akusherstvo i Ginekologija, 2001, 40 :19-23.
- Reference 3658 Porojanova V, Bozinova S. Teenage pregnancy and delivery [in Bulgarian]. Akusherstvo i Ginekologija, 1994, 33 :5-7.
- Reference 3659 Porojanova V, Bojinova S, Bojinov P. Some common problems of adolescent pregnancy and delivery [in Bulgarian]. Akusherstvo i Ginekologija, 1993, 32 :10-13.
- Reference 3768 Balova V, Bozkov B. Some hematological indices in menstruating girl [in Bulgarian]. Akusherstvo i Ginekologija, 1971, 10 :472-476.
- Reference 4157 Boyadjiev N, Taralov Z. Red blood cell variables in highly trained pubescent athletes: a comparative analysis. British Journal of Sports Medicine, 2000, 34 :200-204.