

SPAIN

Last Updated: 2006-10-06

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	1999 -2000	Estella: Adolescents by sex	F	10.00- 14.99	93									NS	3637	*	1
		Estella: Adolescents by sex	M	10.00- 14.99	111												2
S	1997 -1998	Canary Islands: All: Total	B	6.00- 75.99	760							139	14	D	4528	*	
		Women by age	F	18.00- 34.99	90							130	9				
		Women by age	F	35.00- 49.99	115							130	10				
		Women by age	F	50.00- 64.99	89							133	11				
		Men by age	M	18.00- 34.99	65							152	9				
		Men by age	M	35.00- 49.99	79							151	10				
		Men by age	M	50.00- 64.99	70							150	11				
		SAC by sex	F	6.00- 17.99	83							131	8				
		SAC by sex	M	6.00- 17.99	87							138	11				
		Elderly by sex	F	65.00- 75.99	41							136	9				
		Elderly by sex	M	65.00- 75.99	41							151	12				
L	1994 p	Vélez-Málaga: SAC	B	6.00- 15.99	196									C	4335	*	3
L	1989	Betanzos: Elderly: Total	B	70.00- 75.99	175									A	3342	*	4
		Betanzos: Elderly by sex	F	70.00- 75.99	98					9.2		133	14				
		Betanzos: Elderly by sex	M	70.00- 75.99	77						9.1	147	14				
L	1976 P	Madrid: Elderly: Total	B	65.00-NS	307									C	2606	*	5
		Madrid: Elderly by sex	F	65.00-NS	162					18.5		128	14				
		Madrid: Elderly by sex	M	65.00-NS	145						32.4	138	20				

NOTES

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Reference No: 3637

General Notes: *Sampling: sample population of all 811 adolescents aged 10-14 yrs (5.8% of the total population) living in the Estella (Navarra Province) Basic Health Zone, participants recruited by random, systematic sampling (1 out of 4); exclusion of subjects with any acute or chronic disease that might condition the haematological result; disaggregated data by age.*

Line note 1 Prevalence of iron deficiency anaemia 2.7% (Hb <120 g/L+serum ferritin <12 µg/L+transferrin saturation <14% or mean corpuscular volume <75 fL); prevalence of iron deficiency 3.6% (serum ferritin <12 µg/L+transferrin saturation <14% or mean corpuscular volume <75 fL).

Line note 2 Prevalence of iron deficiency anaemia 3.2% (Hb <120 g/L+serum ferritin <12 µg/L+transferrin saturation <14% or mean corpuscular volume <75 fL); prevalence of iron deficiency 3.2% (serum ferritin <12 µg/L+transferrin saturation <14% or mean corpuscular volume <75 fL).

Reference No: 4528

General Notes: *Sampling: cross sectional; representative subsample of subjects that participated in the nutritional survey of the Canary Islands; method: electronic meter (Technicon H-2).*

Reference No: 4335

General Notes: *Facility based study (school); sampling: design not explained.*

Line note 3 Prevalence of anaemia 4.1% (Hb <120 g/L females 6-15 yrs, males 6-14 yrs, Hb <130 g/L males 15 yrs); prevalence value anaemia calculated; prevalence of iron deficiency 2.0% (mean corpuscular volume <74 fL both sexes 6-14 yrs+transferrin saturation <=16%, mean corpuscular volume <80 fL both sexes 15 yrs+transferrin saturation <=16%); disaggregated data by age, sex.

Reference No: 3342

General Notes: *Euronut SENECA study (Survey in Europe on Nutrition and the Elderly, a Concerted Action) conducted in 19 towns (these were chosen for having a stable population of 10 000 to 20 000 and a socioeconomic structure comparable to that of the region or the country as a whole) situated in 12 European countries; sampling: random sample stratified by sex and age, 207 out of 357 selected subjects were enrolled; inclusion only of elderly subjects born in 1913-1918; participation in blood sampling was not mandatory; Hb determination only for subsample; values for other Hb cut-off levels.*

Line note 4 Prevalence value calculated; prevalence of anaemia 9.1% (Hb <120 g/L females, Hb <130 g/L males).

Reference No: 2606

General Notes: *Haematological surveys of representative adult population samples were conducted simultaneously in 12 countries all but one of which are in Europe; sampling: random samples of persons over 65 years of age were taken from a national census covering suburban and rural areas close to Madrid; values for other Hb cut-off levels.*

Line note 5 Prevalence value calculated; prevalence of anaemia 25.1% (Hb <120 g/L females, Hb <130 g/L males).

REFERENCES

SPAIN

- Reference 2606** Elwood PC, Hughes J, Abernethy M, Davies R, Gough R, Johnson AP, Dubourg AY. An international haematological survey. *Bulletin of the World Health Organization*, 1976, 54 :87-95.
- Reference 3342** Dirren H, Decarli B, Lesourd B, Schlienger JL, Deslypere JP, Kiepuski A, Euronut SENECA investigators. Nutritional status: haematology and albumin. *European Journal of Clinical Nutrition*, 1991, 45 (Suppl 3):43-52.
- Reference 3637** Durà Travé T, Aguirre Abad P, Mauleón Rosquil C, Oteiza Flores MS, Díaz Velaz L. Iron deficiency in adolescents 10-14 years of age. *Atención Primaria*, 2002, 29 :72-78.
- Reference 4335** Aguilera F, Lupiañez L, Magaña D, Planells E, Mataix FJ, Llopis J. Iron status in a population of Spanish schoolchildren. *Nahrung*, 1994, 38 :192-198.
- Reference 4528** Henriquez Sánchez P, Díaz Romero C, Rodríguez Rodríguez E, López Blanco F, Álvarez León E, Díaz Cremádes J, Pastor Ferrer MC, Serra Majem L. Evaluación bioquímica del estado nutricional de la población canaria (1998) [Biochemical assessment of nutritional status in the Canary Islands population (1998)]. *Archivos Latinoamericanos de Nutrición*, 2000, 50 (1 Suppl 1):43-54.

ADDITIONAL REFERENCES

SPAIN

- Reference 2560 Olivan Gonzalvo G. Evaluación del estado de salud y nutrición de los adolescentes inmigrantes ilegales de origen magrebí [Assessing the health and nutritional status of illegal immigrant adolescents from Maghreb entering foster care in Zaragoza, Spain]. *Anales Españoles de Pediatría*, 2000, 53 :17-20.
- Reference 3274 Salas J, Font I, Canals J, Fernández J, Marti-Henneberg C. Consumo, hábitos alimentarios y estado nutricional de la población de Reus, VI: riesgo de malnutrición en micronutrientes [Consumption of nutrients, alimentary habits and nutritional status of the Reus population, VI: risk of micronutrient malnutrition]. *Medicina Clinica*, 1987, 88 :405-410.
- Reference 3978 Villarino Rodríguez A, Garcia-Linares MC, Garcia-Fernández MC, Garcia-Arias MT. Evaluación dietética y parámetros bioquímicos de minerales en un colectivo de ancianos de la provincia de León (España) [Dietary assessment and biochemical parameters for minerals in a group of elderly subjects in the province of León (Spain)]. *Nutrición Hospitalaria*, 2003, 18 :39-45.
- Reference 3999 Durá Travé T, Díaz Vélaz L. Prevalencia de la deficiencia de hierro en lactantes sanos de 12 meses de edad [Prevalence of iron deficiency in healthy 12-month-old infants]. *Anales Españoles de Pediatría*, 2002, 57 :209-214.
- Reference 4093 Bermejo B, Olona M, Serra M, Carrera A, Vaqué J. Prevalencia de ferropenia en la población laboral femenina en edad fértil [Prevalence of iron deficiency in a child-bearing working female population]. *Revista Clínica Española*, 1996, 196 :446-450.
- Reference 4223 Colomer C, Alvarez-Dardet C, Donat J, Fernández-Delgado R, Gutierrez D, Colomer J, Nolasco A, Colomer J. Iron deficiency risk factors in infants at one year: a cross-sectional study. *European Paediatric Haematology and Oncology*, 1985, 2 :117-121.
- Reference 4336 Lafuente Mesanza P, Ojembarrena Martinez E, Sasieta Altuna M, Piñan Frances MA, Urreta Dolora MJ, Lombardero Jimenez JL. Anemia y depleción de depósitos de hierro en lactantes sanos de 12 meses de edad [Anemia and depletion of iron reserves in healthy 12-month-old infants]. *Anales Españoles de Pediatría*, 1992, 37 :24-28.
- Reference 4413 Arijá Val V, Fernandez Ballart J, Salas Salvado J. Carencia de hierro y anemia ferropénica en la población española [Iron deficiency and ferropenic anemia in the Spanish population]. *Medicina Clinica*, 1997, 109 :425-430.
- Reference 4475 Garcia-Arias MT, Villarino Rodriguez A, Garcia-Linares MC, Rocandio AM, Garcia-Fernández MC. Iron, folate and vitamins B12 & C dietary intake of an elderly institutionalized population in León, Spain. *Nutrición Hospitalaria*, 2003, 18 :222-225.
- Reference 4521 Monteagudo Montesinos E, Dalmau Serra J, Carreras Gil de Santivañes C. Deficiencia de hierro en lactantes [Iron deficiency in infants]. *Acta Pediátrica Española*, 1999, 57 :145-150.
- Reference 4621 Escanero JF, Villanueva J, Rojo A, Herrera A, del Diego C, Guerra M. Iron stores in professional athletes throughout the sports season. *Physiology & Behavior*, 1997, 62 :811-814.
- Reference 4622 Escanero JF, Herrera A, del Diego C, Guerra M, Villanueva J. Plasmatic iron, transferrin, haptoglobin and ferritin after a cycle-ergometer test in elite athletes supplemented with iron. *Paris, John Libbey Eurotext*, 1998. 5 204-208.
- Reference 4629 Diaz Portillo J, Alarcón Ramirez F, Legrós y Carrenard JR, Hernández Gómez MJ, Jiménez Otero N, Vadillo Andrade J. Valores hematimétricos del lactante: estudio prospectivo sobre la prevalencia de microcitosis y anemia microcítica en dos grupos étnicos [Hematologic values in the infant: prospective study of the microcytosis and microcytic anemia prevalence in two ethnic groups]. *Anales Españoles de Pediatría*, 1995, 43 :171-178.
- Reference 4630 Garcia Vera C, Muñoz Pérez MA, Fortea Gimeno E, Olmedillas Alvaro MJ, Muñoz Izquierdo MP, Marti Talens N, Adivinación Herrero A, Montaner Cosa M. Evaluación del déficit de hierro en niños urbanos sanos de 18 y 24 meses de edad [Iron deficiency evaluation in an urban population of healthy infants at 18 and 24 months of age]. *Anales Españoles de Pediatría*, 1995, 43 :252-256.

ADDITIONAL REFERENCES

SPAIN

- Reference 4631 Olazábal Malo de Molina JI, Alvarez Pérez R, Ariza Hevia F, Ramos Pérez A, Loza Cortina C, Urrechaga E. Prevalencia de ferropenia en una zona de salud rural: relación con el consumo de leche de vaca a los seis, doce y veinticuatro meses de edad [Prevalence of ferropenia in a rural health area: relationship with cow's milk consumption at six, twelve and twenty-four months of age]. *Anales Españoles de Pediatría*, 1995, 40 :99-102.
- Reference 4665 Gaspar MJ, Ortega RM, Moreiras O. Relationship between iron status in pregnant women and their newborn babies: investigation in a Spanish population. *Acta Obstetricia et Gynecologica Scandinavica*, 1993, 72 :534-537.
- Reference 4703 Ripoll AA, Alcaraz-Quñonero M, Mengual Cos M, Morcillo Caballero A, Martínez Gutierrez F, Gonzalez-Moro Prats L, Rodenas Garcia V. Prevalencia de ferropenia y anemia ferropénica en la primera infancia y factores relacionados en una comarca de la región de Murcia [Prevalence of iron deficiency, anemia and related factors in infants in a region of the community of Murcia]. *Anales Españoles de Pediatría*, 1992, 36 :265-268.
- Reference 4704 Gonzalez de Aledo Linos A, Rollan Rollan A, Bonilla Miera C. Estudio prospectivo sobre la prevalencia de ferropenia en lactantes de Cantabria, su relación con la introducción de la leche de vaca y el desarrollo psicomotor [A prospective study on the prevalence of iron deficiency in infants of Cantabria, its relation with the introduction of cow milk and the psychomotor development]. *Anales Españoles de Pediatría*, 1990, 32 :24-27.
- Reference 4762 Altés A, Ruiz MA, Castell C, Roure E, Tresserras R. Déficit y sobrecarga de hierro en la población adulta de Cataluña [Iron deficiency and iron overload in an adult population in Catalonia, Spain]. *Medicina Clinica*, 2004, 123 :131-133.
- Reference 4816 Colomer J, Colomer C, Gutierrez D, Jubert A, Nolasco A, Donat J, Fernandez-Delgado R, Donat F, Alvarez-Dardet C. Anaemia during pregnancy as a risk factor for infant iron deficiency: report from the Valencia Infant Anaemia Cohort (VIAC) study. *Paediatric and Perinatal Epidemiology*, 1990, 4 :196-204.
- Reference 5042 Caballo Roig N, Garcia P, Valdemoro M, Del Castillo ML, Santos Tapia M, Gonzalez Vargaz A, Arias Alvarez MA, Serna Saugan C, Merino JM, Garcia Teresa MA, Garcia Cuartero B, Sanchez Bayle M. Prevalencia de anemia en niños y adolescentes de Madrid [Prevalence of anemia in children and adolescents of Madrid]. *Anales Españoles de Pediatría*, 1993, 39 :219-222.
- Reference 5415 Domínguez I, Reviriego S, Rojo-Martínez G, Valdés MJ, Carrasco R, Coronas I, López-Ojeda J, Pacheco M, Garriga MJ, García-Fuentes E, González Romero S, C-Soriguer Escofet FJ. Déficit de yodo y función tiroidea en una población de mujeres embarazadas sanas [Iodine deficiency and thyroid function in healthy pregnant women]. *Medicina Clinica*, 2004, 122 :449-453.
- Reference 5789 Basora M, Deulofeu R, Salazar F, Quinot L, Gomar C. Improved preoperative iron status assessment by soluble transferrin receptor in elderly patients undergoing knee and hip replacement. *Clinical & Laboratory Haematology*, 2006, 28 :370-375.