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XXII Jornada Regional de Hematologia e Hemoterapia

VIII Encontro Regional de Enfermagem em Hemoterapia e Hemovigilância

I Encontro Regional de Farmácia em Hematologia e Hemoterapia

Hemocentro Regional de Sobral, Ceará

HEMOCENTRO REGIONAL DE SOBRAL
1991 25 anos 2016
JUBILEU DE PRATA

27 a 29 de setembro | 2017

Hospital Regional Norte, Sobral, Ceará
XXII Jornada Regional de Hematologia e Hemoterapia

Faculdade de Medicina, Campus Sobral-UFC, Sobral, Ceará
VIII Encontro Regional de Enfermagem e I Encontro Regional de Farmácia

HEMOCE
CENTRO DE HEMATOLOGIA E HEMOTERAPIA DO CEARÁ

GOVERNO DO ESTADO DO CEARÁ
Secretaria da Saúde

ANEMIA NA GESTAÇÃO

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Medicina Interna – FAMED, UFRGS
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Sobral 2017

Worldwide prevalence of anaemia 1993–2005

WHO Global Database on Anaemia

World Health Organization

Centers for Disease Control and Prevention
Atlanta

Table 2.1 ***Haemoglobin thresholds used to define anaemia***

Age or gender group	Haemoglobin threshold (g/l)
Children (0.50–4.99 yrs)	110
Children (5.00–11.99 yrs)	115
Children (12.00–14.99 yrs)	120
Non-pregnant women (≥15.00 yrs)	120
Pregnant women	110
Men (≥15.00 yrs)	130

Source: adapted from reference (*2*)

Table 2.3 ***Classification of anaemia as a problem of public health significance***

Prevalence of anaemia (%)	Category of public health significance
≤4.9	No public health problem
5.0–19.9	Mild public health problem
20.0–39.9	Moderate public health problem
≥40.0	Severe public health problem

Source: adapted from reference (*2*)

Table 3.1 ***Population coverage (%) by anaemia prevalence surveys (national or subnational) conducted between 1993 and 2005***

WHO region	PreSAC[a]	PW	NPW	SAC	Men	Elderly	All
Africa (46)[b]	74.6 (26)[c]	65.8 (22)	61.4 (23)	13.2 (8)	21.9 (11)	0.0 (0)	40.7
Americas (35)	76.7 (16)	53.8 (15)	56.2 (13)	47.1 (9)	34.3 (2)	47.6 (1)	58.0
South-East Asia (11)	85.1 (9)	85.6 (8)	85.4 (10)	13.6 (3)	4.1 (2)	5.2 (1)	14.9
Europe (52)	26.5 (12)	8.3 (4)	28.0 (12)	9.3 (3)	14.1 (3)	8.0 (2)	22.9
Eastern Mediterranean (21)	67.4 (11)	58.7 (7)	73.5 (11)	15.5 (6)	27.5 (6)	3.2 (3)	84.3
Western Pacific (27)	90.4 (10)	90.2 (8)	96.9 (13)	83.1 (7)	96.2 (10)	93.3 (6)	13.8
Global (192)	**76.1 (84)**	**69.0 (64)**	**73.5 (82)**	**33.0 (36)**	**40.2 (34)**	**39.1 (13)**	**48.8**

[a] Population groups: PreSAC, preschool-age children (0.00–4.99 yrs); PW, pregnant women (no age range defined); NPW, non-pregnant women (15.00–49.99 yrs), SAC, school-age children (5.00–14.99 yrs), Men (15.00–59.99 yrs), Elderly (≥60.00 yrs).

[b] Number of countries in each grouping.

[c] Total number of countries with data, no figure is provided for All since each country may be partially covered by some population groups, but few countries have data on all 6 population groups and no countries have data for women 50–59 yrs of age.

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PLOS ONE

High Prevalence of Anemia in Children and Adult Women in an Urban Population in Southern Brazil

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July 2013 | Volume 8 | Issue 7 | e68805

Table 1. Univariate analysis of predicting factors for anemia in children in Rio Grande do Sul, Southern Brazil, 2006–2007.

Characteristics	N(2198) anemic/total	Prevalence (%)	Gross PR (CI 95%)	P-value
Gender*				
Female	486/1109	43.8%	1	
Male	510/1077	47.3%	1.081(0.986–1.184)	0.098
Age in months				
18 to 23	97/127	76%	2.500(2.042–3.063)	0.000
24 to 35	260/422	62%	2.017(1.662–2.448)	0.000
36 to 47	196/446	44%	1.439(1.170–1.769)	0.001
48 to 59	176/438	40%	1.316(1.065–1.626)	0.011
60 to 71	187/490	38%	1.249(1.012–1.543)	0.038
≥72	84/275	31%	1	
SeS				
A and B	69/201	34.3%	1	
C	347/836	41.5%	1.209(0.983–1.488)	0.073
D	447/933	47.9%	1.396(1.140–1.709)	0.001
E	132/219	60.3%	1.756(1.410–2.186)	0.000
	9 missing			

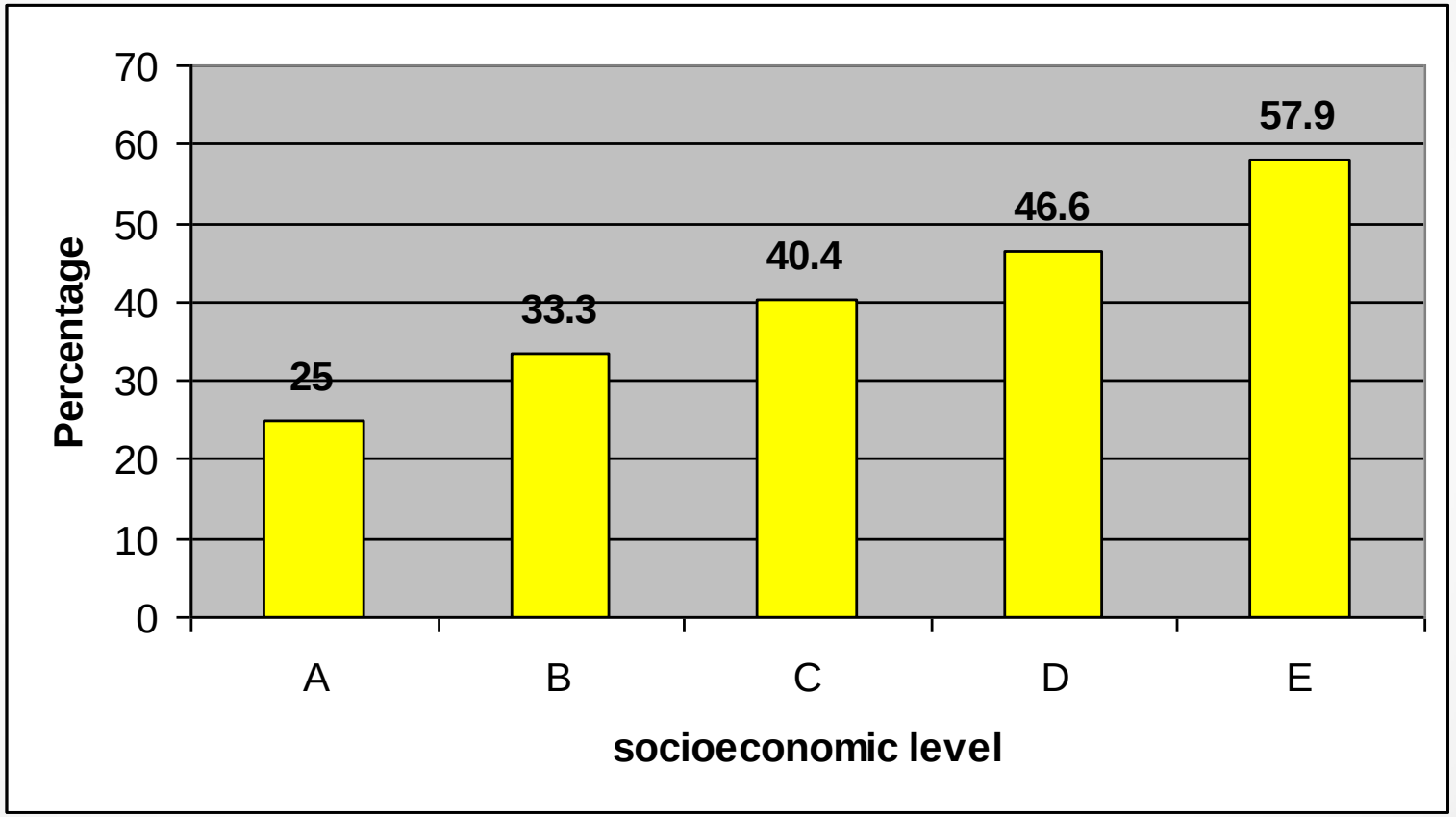
SeS = socioeconomic status,
*12 missing.
doi:10.1371/journal.pone.0068805.t001

Table 2. Univariate analysis of the predicting factors for anemia in women and crude PR of anemia according to age, social class and skin color in RS, Southern Brazil, 2006–2007.

Characteristics	N (1999)	Prevalence (%)	Crude PR (CI 95%)	P-value
SeS*				
A and B	100/318	31.4%	1	
C	292/847	34.5%	1.096 (0.909–1.322)	0.335
D	267/680	39.3%	1.249 (1.035–1.506)	0.020
E	68/152	44.7%	1.423 (1.119–1.808)	0.004
Skin color #				
White	416/1220	34.1%	1	
Black	182/414	44%	1.289 (1.128–1.474)	0.000
Other	119/336	35.4%	1.039 (0.881–1.224)	0.651
Age				
14 to 17 years	183/482	37.9%	1.231 (0.891–1.701)	0.209
18 to 19 years	88/232	37.9%	1.229 (0.871–1.735)	0.240
20 to 24 years	212/620	34.2%	1.108 (0.803–1.529)	0.531
25 to 29 years	217/571	38%	1.232 (0.894–1.697)	0.202
≥30 years	29/94	30.8%	1	

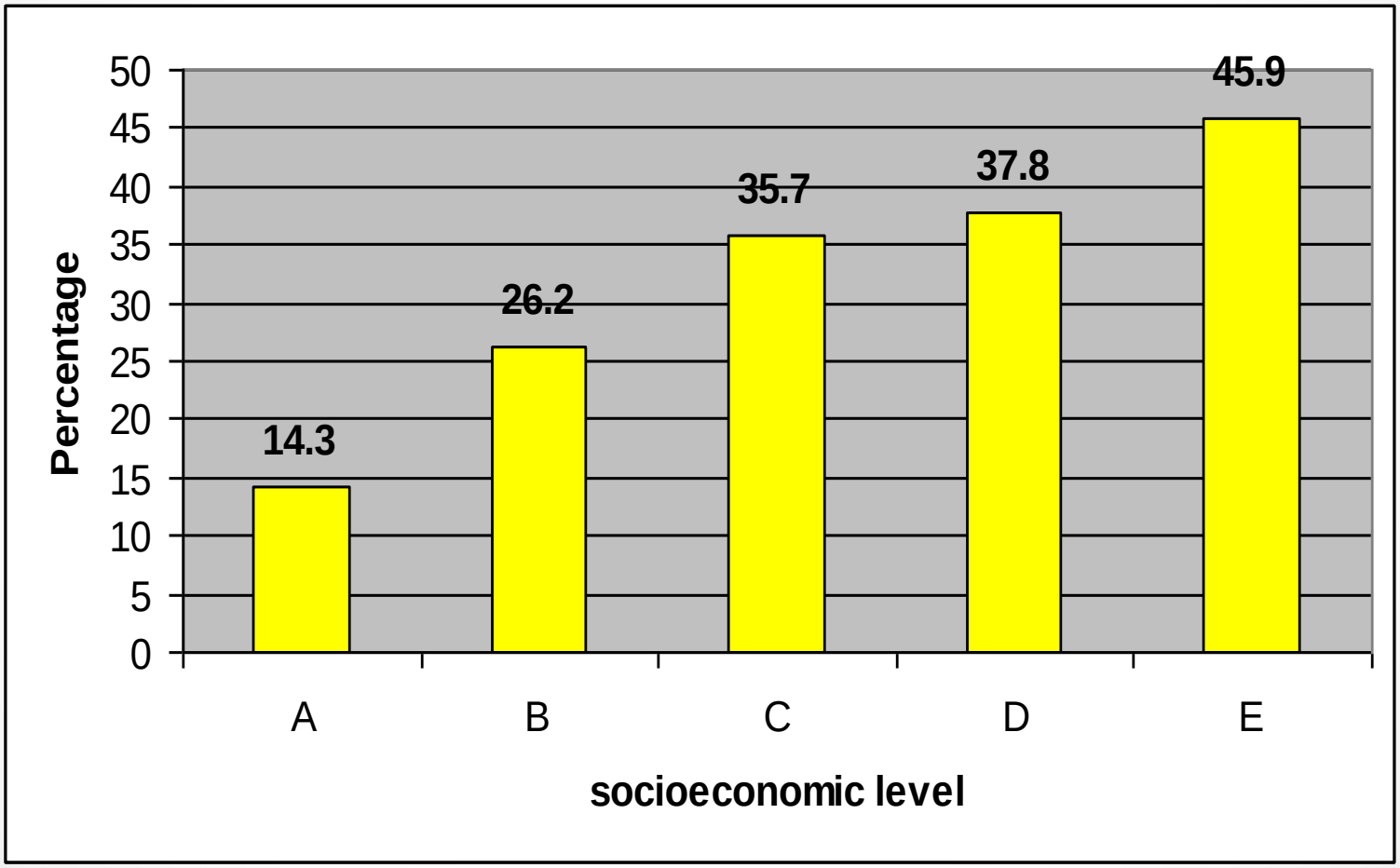
SeS – socioeconomic status,
*2 missing,
#29 missing.
doi:10.1371/journal.pone.0068805.t002

Prevalence of anemia in children by socioeconomic class level



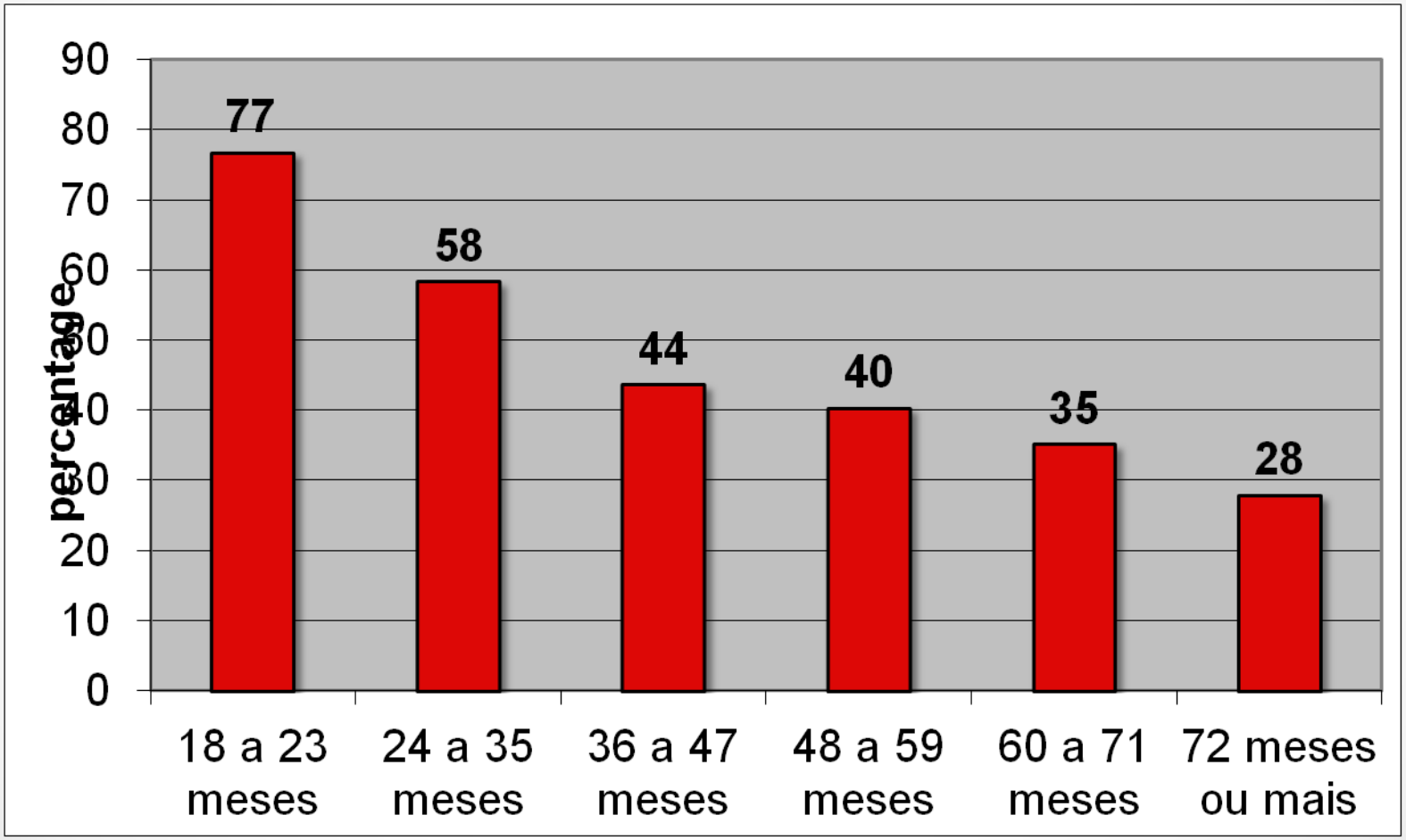
p < 0,001

Prevalence of anemia in women by socioeconomic class level



p = 0,006

Age distribution of anemia in children



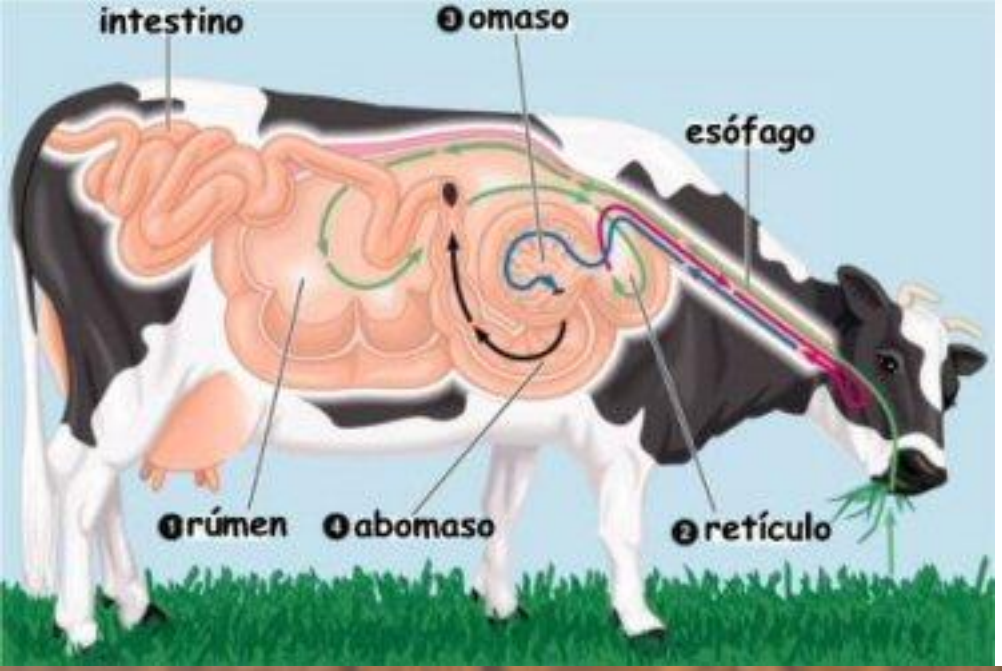
$p < 0,001$

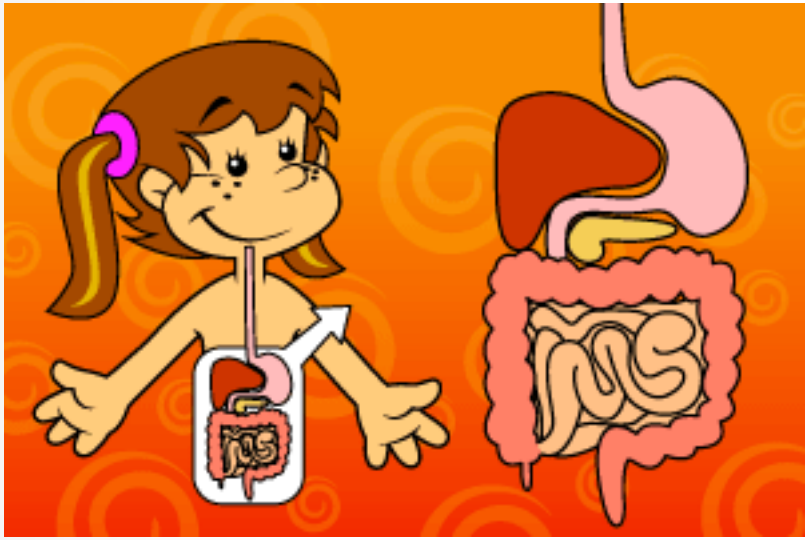
Iron Deficiency

324 children with 1 year of age in São Leopoldo RS

64% anemic

90% with ferritin < 15 µ/dl


intestino
3 omaso
esófago
1 rúmen
4 abomaso
2 retículo



result from normal maternal physiological adaptations rather than represent true iron deficiency anaemia.[3 4] Haemoglobin, serum iron, and ferritin concentrations are reduced in early pregnancy both in women who are taking supplements and in women who are not, and they increase again by the sixth day after delivery.[5] This suggests that during pregnancy other factors,

shown no anaemia or iron deficiency (see below). Ea
woman was studied three times during pregnancy,
12, 24, and 36 weeks' gestation (within one week), a
once 16-24 (average 18) weeks after delivery provid
that normal menstruation had resumed and lactati
had stopped. Four of the women were not studied af
delivery: two had received oral iron supplemer

Assessment of iron status in US pregnant women from the National Health and Nutrition Examination Survey (NHANES), 1999–2006[1–4]

Zuguo Mei, Mary E Cogswell, Anne C Looker, Christine M Pfeiffer, Sarah E Cusick, David A Lacher, and Laurence M Grummer-Strawn

Am J Clin Nutr 2011;93:1312–20.

TABLE 1

Values for total body iron [calculated from serum ferritin and soluble transferrin receptor (sTfR) concentrations], serum ferritin, serum sTfR, and hemoglobin in US pregnant women (n = 1171) in the National Health and Nutrition Examination Survey (NHANES), 1999–2006[1]

	Total body iron	Ferritin	sTfR	Hemoglobin
	mg/kg	*μg/L*	*mg/L*	*g/L*
Mean (95% CI)[2]	3.86 (3.39, 4.33)	23.57 (21.12, 26.31)	3.32 (3.22, 3.46)	124.6 (123.3, 125.9)
Median (95% CI)	4.08 (3.57, 4.73)	23.55 (20.58, 28.68)	3.11 (3.02, 3.24)	124.2 (122.7, 125.6)
25th percentile (95% CI)	1.05 (0.62, 1.67)	11.01 (9.82, 12.99)	2.63 (2.53, 2.72)	117.1 (115.3, 119.3)
75th percentile (95% CI)	7.02 (5.92, 7.60)	46.20 (39.99, 54.24)	3.97 (3.80, 4.17)	130.8 (130.0, 132.9)
Percentage of abnormal value[3] (95% CI)	18.0 (15.2, 20.8)	25.0 (20.8, 29.2)	17.4 (14.1, 20.7)	5.4 (3.1, 7.8)

[1] All analyses were weighted. 95% CIs took into account the design effect.

[2] Arithmetic mean for total body iron and hemoglobin and geometric mean for ferritin and serum sTfR concentrations.

[3] Abnormal values for total body iron and ferritin and sTfR concentrations were <0 mg/kg, <12.0 μg/L, and >4.4 mg/L, respectively. Abnormal values for hemoglobin concentrations were <110, <105, <110, and <110 g/L for pregnant women in the first, second, third, and unknown trimesters, respectively.

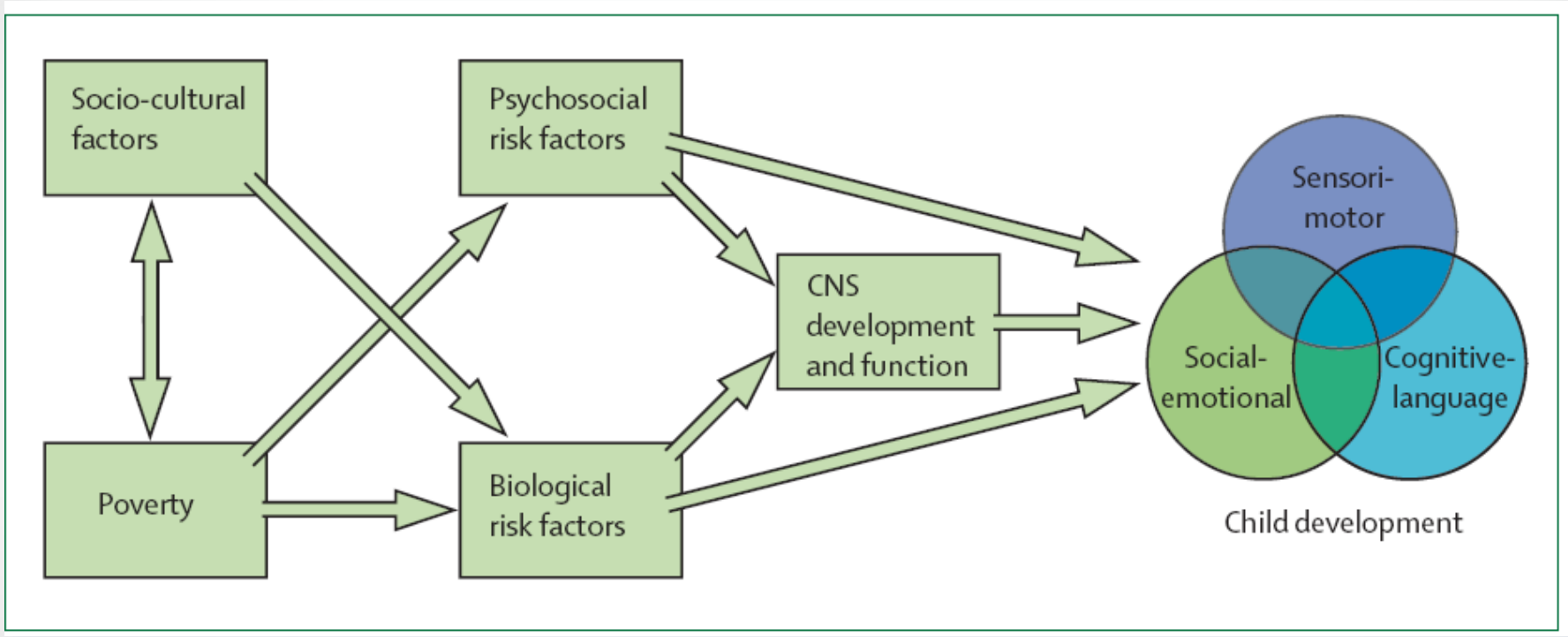
TABLE 2
Values for total body iron (calculated from serum ferritin and soluble transferrin receptor concentrations) and iron deficiency (total body iron <0 mg/kg) in US pregnant women in the National Health and Nutrition Examination Survey (NHANES), 1999–2006[1]

	n	Unadjusted mean (95% CI)	Adjusted mean (95% CI)	Unadjusted prevalence (95% CI)	Adjusted prevalence (95% CI)
Survey years		*mg/kg*	*mg/kg*	%	%
1999–2000	258	3.27 (2.22, 4.33)[a]	3.00 (2.13, 3.87)[a]	24.5 (19.6, 29.4)[a]	26.4 (21.2, 31.7)[a]
2001–2002	319	3.83 (3.00, 4.66)[a]	2.98 (2.45, 3.51)[a]	14.4 (8.8, 20.0)[b]	16.8 (10.7, 22.9)[b,c]
2003–2004	241	4.69 (3.70, 5.67)[a]	4.81 (4.15, 5.48)[b]	12.4 (7.4, 17.4)[b]	11.3 (6.9, 15.7)[b]
2005–2006	353	3.93 (3.18, 4.69)[a]	4.11 (3.62, 4.59)[b]	18.5 (12.7, 24.4)[a,b]	18.1 (13.5, 22.6)[c]
Age					
12–19 y	161	3.44 (2.70, 4.18)[a]	2.54 (1.53, 3.54)[a]	18.4 (9.6, 27.2)[a]	29.9 (11.4, 48.4)[a]
20–34 y	903	3.54 (3.05, 4.03)[a]	3.34 (2.95, 3.72)[a]	20.3 (16.8, 23.7)[a]	20.7 (17.4, 24.1)[a]
35–49 y	107	5.79 (4.35, 7.23)[b]	6.16 (5.13, 7.19)[b]	5.7 (1.5, 10.0)[b]	4.5 (0.8, 8.2)[b]
Trimester					
First	189	6.43 (5.60, 7.26)[a]	6.28 (5.70, 6.86)[a]	5.8 (2.4, 9.2)[a]	6.9 (2.6, 11.2)[a]
Second	416	4.20 (3.35, 5.04)[b]	4.25 (3.57, 4.93)[b]	14.7 (9.2, 20.2)[b]	14.3 (10.2, 18.5)[b]
Third	384	1.39 (0.79, 1.99)[c]	1.26 (0.77, 1.75)[c]	29.5 (21.9, 37.0)[c]	29.7 (24.4, 34.9)[c]
Unknown	182	4.49 (3.00, 5.98)[d,b]	3.89 (2.39, 5.39)[d,b]	18.0 (7.6, 28.3)[b,c]	19.6 (7.8, 31.4)[b,c]
Parity					
0	369	4.45 (3.44, 5.47)[a]	4.45 (3.68, 5.21)[a]	12.2 (5.8, 18.5)[a]	12.2 (5.6, 18.8)[a]
1	370	3.63 (2.95, 4.32)[a,b]	3.66 (3.13, 4.19)[a]	16.2 (9.8, 22.6)[a]	16.6 (10.4, 22.8)[a]
≥2	348	2.94 (2.32, 3.56)[b]	2.87 (2.33, 3.41)[b]	27.7 (20.3, 35.1)[b]	28.4 (21.0, 35.9)[b]
Race-ethnic group					
Mexican American	347	3.14 (2.59, 3.69)[a]	3.28 (2.65, 3.92)[a]	24.1 (19.7, 28.4)[a]	23.6 (17.8, 29.4)[a]
Non-Hispanic white	517	4.45 (3.82, 5.09)[b]	3.87 (3.39, 4.36)[a,c]	12.1 (8.7, 15.6)[b]	13.9 (10.3, 17.5)[b]
Non-Hispanic black	182	2.51 (1.49, 3.54)[a]	2.61 (1.75, 3.48)[b]	31.0 (21.7, 40.2)[a]	29.6 (21.1, 38.1)[a]
Other	125	3.70 (2.51, 4.88)[a,b]	4.50 (3.50, 5.49)[c]	21.1 (8.5, 33.8)[a,b]	18.8 (9.3, 28.4)[a,b]
Education					
Less than high school	371	4.02 (3.06, 4.98)[a]	4.27 (3.34, 5.20)[a]	17.5 (12.3, 22.8)[a]	13.6 (7.8, 19.4)[a]
High school diploma	259	3.27 (2.40, 4.14)[a]	3.18 (2.32, 4.05)[a]	23.3 (15.3, 31.2)[a]	21.0 (12.0, 30.1)[a]
More than high school	540	3.99 (3.27, 4.72)[a]	3.60 (3.01, 4.19)[a]	16.4 (11.5, 21.3)[a]	20.3 (13.6, 27.0)[a]
Family income					
<130% of poverty-income ratio	401	3.48 (2.74, 4.22)[a]	3.67 (2.88, 4.47)[a]	20.1 (14.1, 26.0)[a]	18.1 (10.8, 25.4)[a]
≥130% of poverty-income ratio	699	3.94 (3.32, 4.57)[a]	3.67 (3.27, 4.08)[a]	17.7 (14.2, 21.1)[a]	19.0 (15.4, 22.5)[a]

[1] Within a group, values with different superscript letters were significantly different ($P < 0.05$, 2-tailed t test). n values were unweighted; all other analyses were weighted. 95% CIs took into account the design effect. Analyses for adjusted means or prevalences were restricted to subjects with no missing information for all variables listed in the table ($n = 1057$). Adjusted means or prevalences took into account all sociodemographic characteristic variables listed in the table. For example, the adjusted mean total body iron or prevalence of iron deficiency for each age group was adjusted for the survey, race-ethnic group, trimester, parity, education, and family income.

poor development during infancy persists in most cases after iron therapy has corrected iron status. If iron deficiency occurs in preschool and older children, the consequences appear reversible with treatment. The biologic understanding of this relationship between development, brain iron status, and functioning is sparse though animal studies repeatedly demonstrate alterations in dopamine metabolism and in the myelination process. Dietary iron deficiency can rapidly deplete brain iron concentrations and repletion is able to normalize them. Residual alterations in striatal dopamine metabolism and myelin production persist if neonatal animals are used. Future studies with more specific measures of neurodevelopment in iron-deficient human infants, and animal models, will allow investigators to more clearly define causal roles of brain iron in neural development and functioning.

CONTENTS



www.thelancet.com Vol 369 January 13, 2007

Arch Pediatr Adolesc Med. 2006 November ; 160(11): 1108–1113.

DOUBLE BURDEN OF IRON DEFICIENCY IN INFANCY AND LOW SOCIO-ECONOMIC STATUS: A LONGITUDINAL ANALYSIS OF COGNITIVE TEST SCORES TO 19 YEARS

Betsy Lozoff, M.D, **Elias Jimenez, M.D**[1], and **Julia B. Smith, Ed.D**

Center for Human Growth and Development and Department of Pediatrics and Communicable Diseases, University of Michigan, Ann Arbor, Michigan (BL); Hospital Nacional de Niños, San Jose, Costa Rica (EJ); Educational Leadership, Oakland University, Rochester, Michigan (JBS)

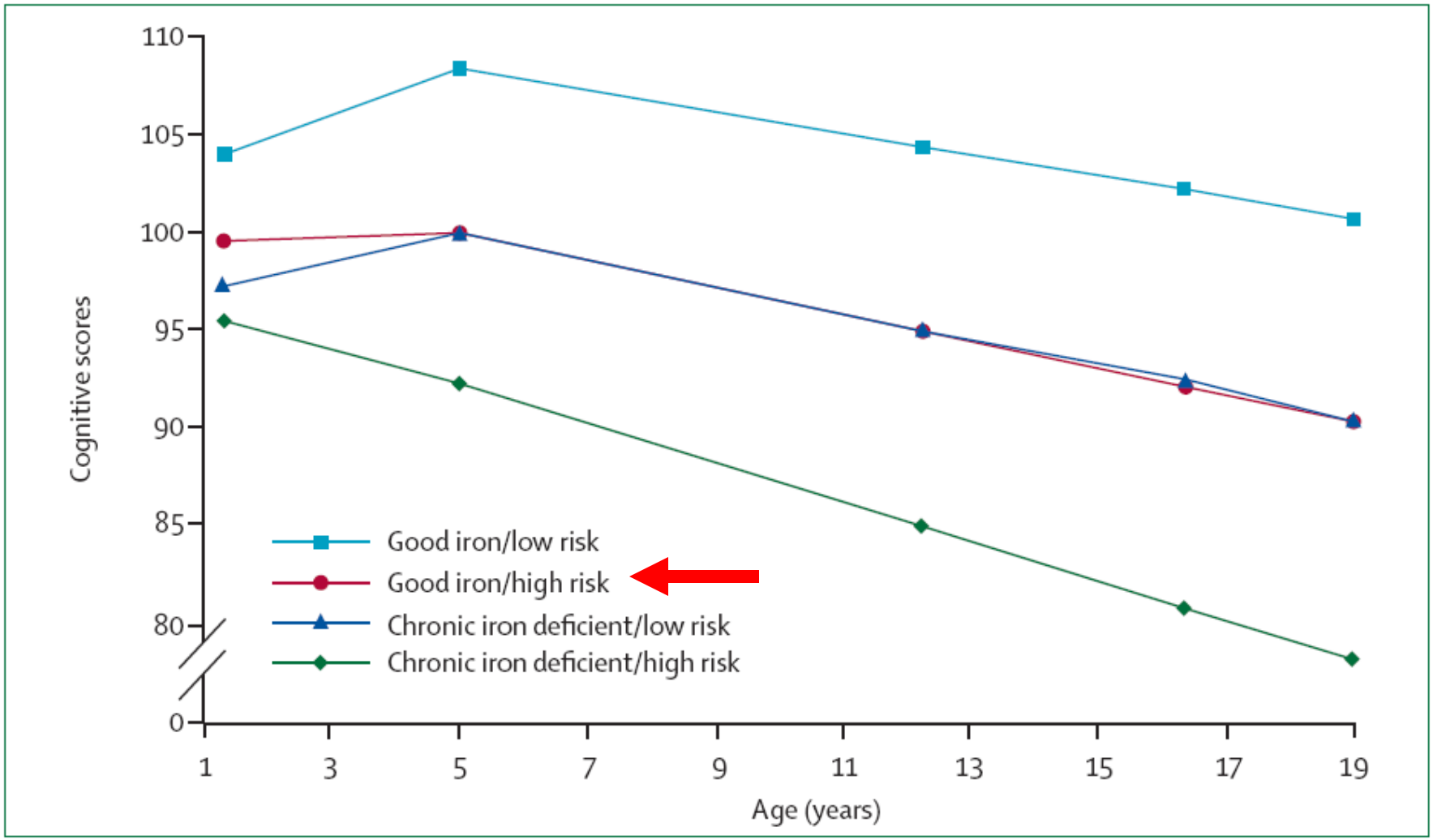


Figure 6: **Cognitive test scores to young adulthood by iron status in infancy and cumulative risk**

Lozoff B, Jimenez E, Walter T. Double burden of iron deficiency and low socio-economic status: a longitudinal analysis of cognitive test scores to 19 years. *Arch Pediatr Adolesc Med* 2006; 160: 1108–13.

H R

depressed or low IQ mother
low stimulus
low socioecomic level

FATORES DE RISCO

- DIMINUIÇÃO DA INGESTA
- ALIMENTOS COM FITATO E CITRATO...
- PERIODO DA VIDA ONDE AS NECESSIDADES SÃO MAIORES infância adolescencia e gestação