ferritin (SF), hemoglobin (Hb) and hemoglobin content in reticulo-
cytes (CHr). We measured C-reactive protein (CRP) to identify infec-
tions. Parents filled in a questionnaire to identify risk factors for ID.

Results Until now we included 350 healthy infants. Forty infants were excluded (CRP>5 mg/l). ID (SF < 12 µg/l and IDA (SF < 12 
µg/l and Hb < 6.8 mmol/l) were detected in 60 (19.4%) and 27 
(8.7%) of the 310 remaining infants respectively. CHr was measured in 249 infants. 32 of 249 (12.9%) infants showed iron deficient erythrocytes (CHr < 26 pg). Iron intake and use of iron fortified 
formula were associated with less ID (p=0.02 and p=0.01). Intake of 
>500 ml cow’s milk/day was negatively associated with iron status 
(p=0.01).

Conclusion ID is present in 19.4% of healthy young infants aged 
0.5 to 5 years in the Netherlands.

Iron status was positively associated with iron intake and the 
use of iron fortified formula and negatively associated with excess-
tive intake of cow’s milk.

SCHOOL-BASED OBESITY AND RELATED CARDIOVASCULAR 
DISEASE PREVENTION INTERVENTIONS IMPROVE WEIGHT 
AND ACADEMIC PERFORMANCE OVER A THREE-YEAR 
STUDY

doi:10.1136/archdischild-2012-302724.0363

1D Hollar, 6G Lopez-Mitnik, 1H Hollar, 7S Messiah, 1Mississippi Food Network/University 
of Miami Miller School of Medicine; 2University of Miami Miller School of Medicine, 
Miami; 3Nova Southeastern University College of Osteopathic Medicine, Fort 
Lauderdale, FL, USA

Background Childhood obesity and related health consequences 
continue to be major clinical and public health issues in the US and 
abroad. Healthier Options for Public Schoolchildren (HOPS) was a 
school-based obesity prevention intervention with nutrition and 
physical activity components implemented in the elementary 
school setting and targeting 6–12 year olds.

Methods HOPS was implemented in August, 2004 through 
December 2009, and included approximately 3,200 children (48% 
Hispanic) attending four elementary schools in Florida. Demog-
graphic, anthropometric (height, weight, body mass index [BMI]) 
and academic (Florida Comprehensive Assessment Test [FCAT]) 
were collected during the school year. Interventions included modified 
dietary offerings, nutrition and lifestyle educational curricula, 
school gardens, and other school-based wellness projects.

Results Repeated measures analysis showed over a three 
year study period the intervention Z weight scores decreased signifi-
cantly among boys (0.81 to 0.71, P<0.001) with a trend among girls 
(0.56 to 0.51, P<0.02) was shown. Over the same time period, FCAT math 
scores improved significantly among girls (308 to 319, p
<0.001) and 
reading scores improved significantly among boys (299 to 307,
P<0.01). Within ethnicity, Hispanics significantly improved both 
math and reading scores. In white students (0.54 to 0.51, P
<0.01) and 
whites (0.62 to 0.59, P<0.001) with a trend among girls 
çntantly among boys (0.81 to 0.71, P
<0.02) was shown. Over the same time period, FCAT math 
scores improved significantly among girls (308 to 319, p
<0.001) and 
reading scores improved significantly among boys (299 to 307,
P<0.01). Within ethnicity, Hispanics significantly improved both 
math and reading scores. In white students (0.54 to 0.51, P
<0.01) and 
whites (0.62 to 0.59, P<0.001) with a trend among girls

Conclusion CESAREAN SECTION IS ASSOCIATED WITH BODY MASS 
INDEX IN CHILDHOOD IN TWO BRAZILIAN BIRTH COHORT 
STUDIES

doi:10.1136/archdischild-2012-302724.0384

1MZ Goldani, 1H Bettiol, 2MR Gutierrez, 3VC Cardoso, 4MA Barbieri, 2MR Barbieri, 2AAM 
da Silva, 1HAS Goldani. 1Pediatría, Hospital de Clínicas de Porto Alegre, Porto Alegre; 
2Pediatría e Puericultura, 3Puericultura e Pediatría, Universidade de São Paulo, Ribeirão 
Preto; 4Pediatría, Universidade Federal do Rio Grande do Sul, Porto Alegre; 3Saúde 
Coletiva, Universidade Federal do Maranhão, São Luís, Brazil

Background A significant association was found between cesarean 
section (CS) and obesity at adulthood in our previous study.

Objective To assess the association between CS and obesity in 
schoolchildren.

Methods We carried out two birth cohorts in Brazil: in Ribeirao 
Preto (RP) in 1994 and in São Luís (SL) in 1997. 2546 pairs of 
mothers-newborns were evaluated in RP and 2542 pairs in SL. Birth 
length and weight and variables were collected after delivery: gen-
der, gestational age, type of delivery, maternal schooling and 
smoking. In 2004/2005 a random sample was reassessed with 
antropometric measurements: 790 children aged 10–11 years in RP 
and 673 children aged 7–9 years in SL. The outcomes were BMI in Z 
score and obesity (>95th percentile per age). A logistic model 
was used to investigate the association between CS and obesity. A 
multiple regression model was applied to investigate the association 
between CS and BMI.

Results Obesity rate was 13% in RP and 2.0% in SL. In the logistic 
regression, the association between CS and obesity remained signifi-
cant after adjustment only in RP [1.72 (C195% 1.01–2.92)]. The lin-
ear coefficient after adjustment the association were 0.31 (95%CI 0
11–0.51) in SL and 0.25 (95%CI 0.05–0.46) in RP.

Conclusion Cesarean section was associated to increased BMI in 
both cities, as previously found in adults. CS remained associated 
with obesity only in RP. We reinforce the previous hypothesis that 
intestinal flora related to type of delivery may play a role in the 
epidemic of obesity worldwide.

MATERNAL PERCEPTION OF CHILD BODY MASS 
INDEX (BMI) AND CONCERNS RAISED BY HEALTH 
PROFESSIONALS

doi:10.1136/archdischild-2012-302724.0385

1SC Tough, 1SW McDonald. 2M Veked, 1K Benzie, 1M Hicks, 1J Siewer. 1Pediatrics; 
2Community Health Sciences, University of Calgary; 3Public Health Innovation and Decision 
Support, Alberta Health Services; 4Nursing, University of Calgary, Calgary, AB, Canada

Background and Aims To describe maternal perceptions of their 
child’s BMI and maternal report of concerns about body weight 
raised by a health professional.

Methods Data collection took place in 2010 when children were 
between 6 and 8 years of age and questionnaires were mailed to 706 
mothers who were part of a longitudinal cohort that had been fol-
lowed since pregnancy. Mothers reported the child’s anthropomet-
ric measures, and BMI was categorized as underweight, healthy, 
overweight, or obese based on the child’s age and sex according to 
the World Health Organization Growth Charts adapted for 
Canada.

Results 450 participants completed the questionnaire (response 
rate 64%). 74% of children had a healthy BMI, 10% were under-
weight, 9% were overweight, and 7% were obese. 80% of parents 
whose child was underweight believed their child was about 
the right weight and only 13% recalled a health professional recently 
raising concerns about their child being underweight. 59% of par-
ents whose child was overweight believed their child was about 
the right weight and only 6% recalled a health professional recently 
raising concerns about their child being overweight. 82% of parents 
whose children were obese believed their child was about the right 
weight and only 18% recalled a health professional recently raising 
concerns about their child being overweight.

Conclusions The majority of parents whose children were not a 
healthy BMI misclassified their child’s weight status, suggesting 
that there are opportunities for health professionals to educate par-
ents about healthy BMI for their child’s age and sex.