

# **Prevalence and Associated factors of childhood obesity. Buenos Aires. Argentina**

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ILSI Argentina

Committee on Nutrition, Obesity and Physical Activity

# Goals

- Main Goals:
  - Determine prevalence of obesity
  - Characterize the factors linked to obesity in the pre-adolescent population
- Secondary Goals:
  - Characterize anthropometrics of the population
  - Characterize and quantify the physical activity performed by this population
  - Characterize the average weekly time of sedentary activities
  - Analyze food intake

**¿What factors or causes  
contribute to obesity in children?**

# Recent information about the subject

Global Prevalence of obesity in children and adolescents. Criteria: IOTF. 5-17 años

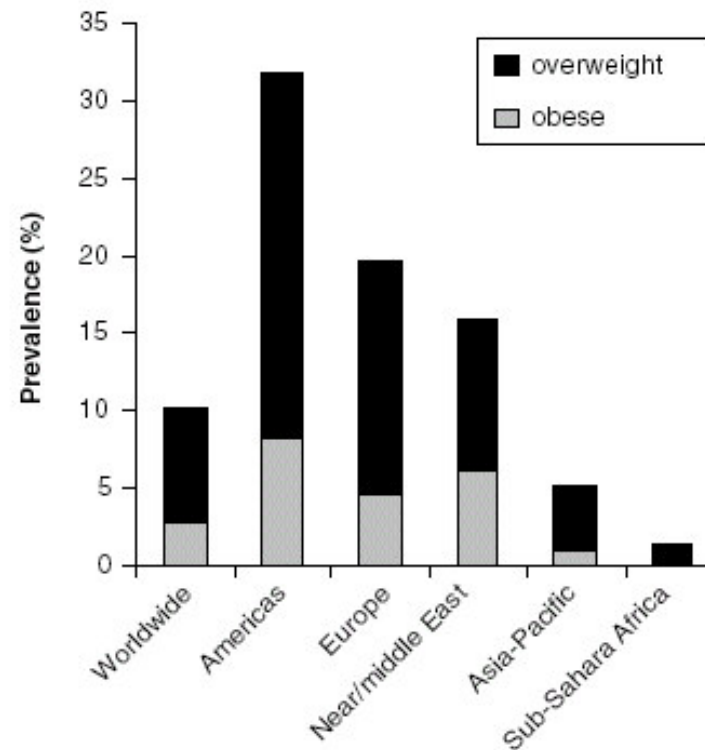
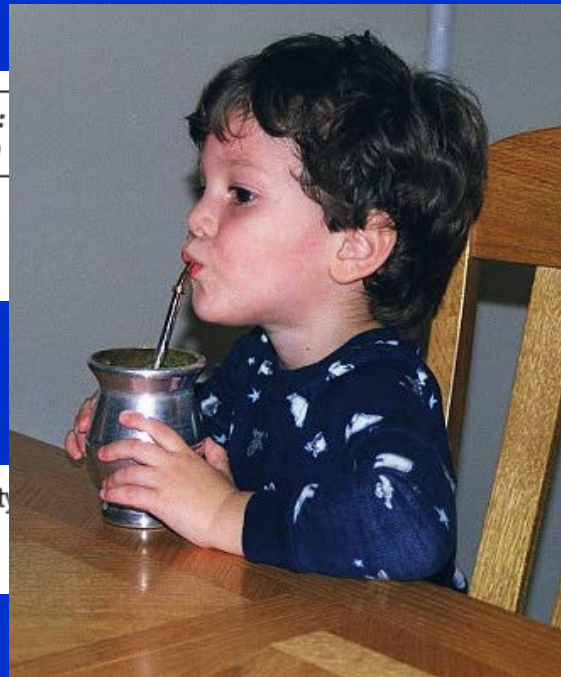


Figure 1 Prevalence of overweight and obesity among school-age children in global regions. Overweight and obesity defined by IOTF criteria. Children aged 5–17 years. Based on surveys in different years after 1990. Source: IOTF (1).

# Associated factors: What we know?



- Many studies of developed countries have demonstrated different associated factors, while few studies are from developing countries.



*Symposium: Modifying the Food Environment:  
Density, Food Costs, and Portion Size*

**Portion Sizes and the Obesity Epidemic<sup>1,2</sup>**  
Jenny H. Ledikwe, Julia A. Eilo-Martin, and Barbara J. Rolls<sup>3</sup>

**Prevalence in Polish 7-**

*\* Magdalena Ostaszewska-Gwinianowicz, † and Study Group ‡*

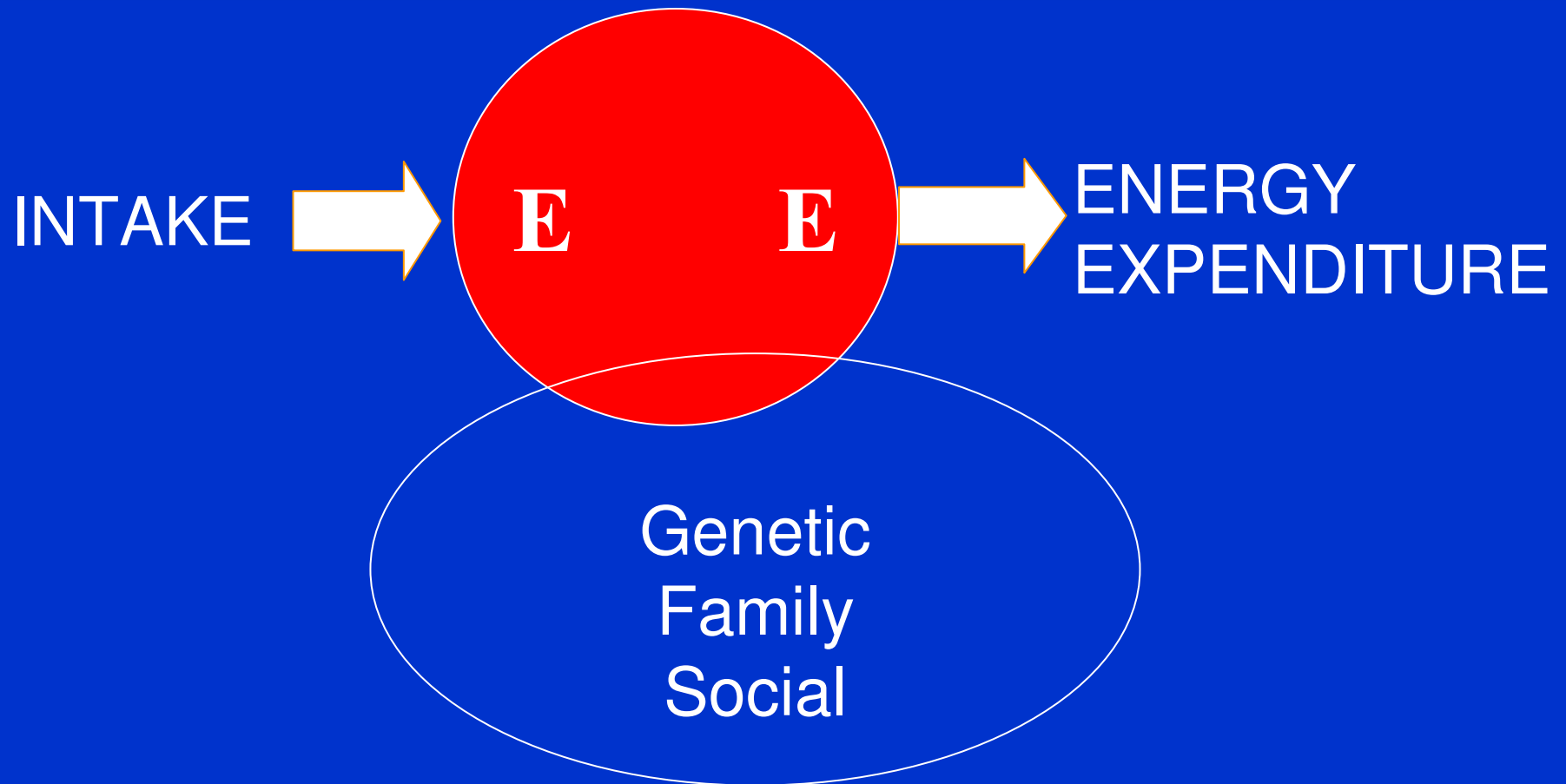
**es and Diet Costs: an Economic Analysis<sup>1,2</sup>**  
ewnowski<sup>3</sup> and Nicole Darmon<sup>4</sup>  
Sciences Program, School of Public Health and Community Medicine, University of Washington, A and \*Institut National pour la Science et la Recherche Médicale (INSERM) Unité 557, †The National des Arts et Métiers, Paris 75003, France

**The influence of food portion size and energy density intake: implications for weight management<sup>1-4</sup>**  
Julia A Eilo-Martin, Jenny H Ledikwe, and Barbara J Rolls

**n Sizes to the**

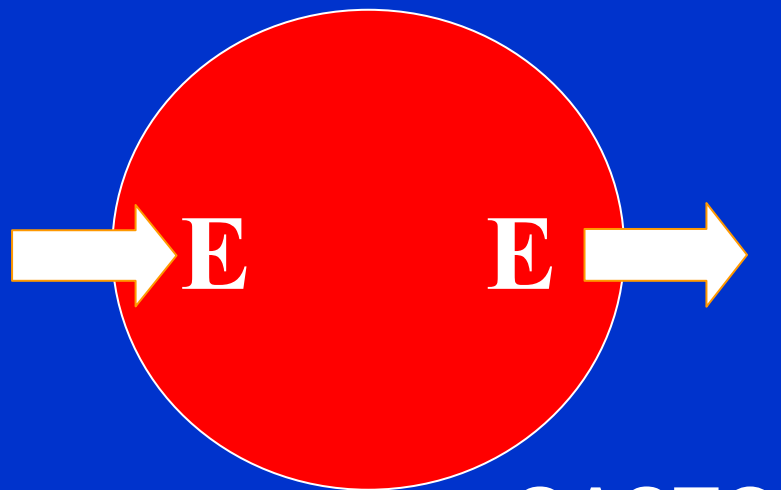
## ... Pre-existing knowledge:

Associated factors...



# Design: Analysis of caloric intake and energy intake

INGESTA



GASTO

Familiares  
Sociales

- Análisis de la calidad nutricional
    - registro alimentario diario
    - frecuencia de consumo semanal.
  - Análisis de las características de los patrones de ingesta autóctonos
- 
- Registro de actividad física diaria ( día anterior) y semanal
    - Deportiva
    - Recreacional
  - Horas invertidas en actividades sedentarias: TV, computadora, videojuegos, etc.
- 
- Datos de peso/ talla/ padres

# Stages

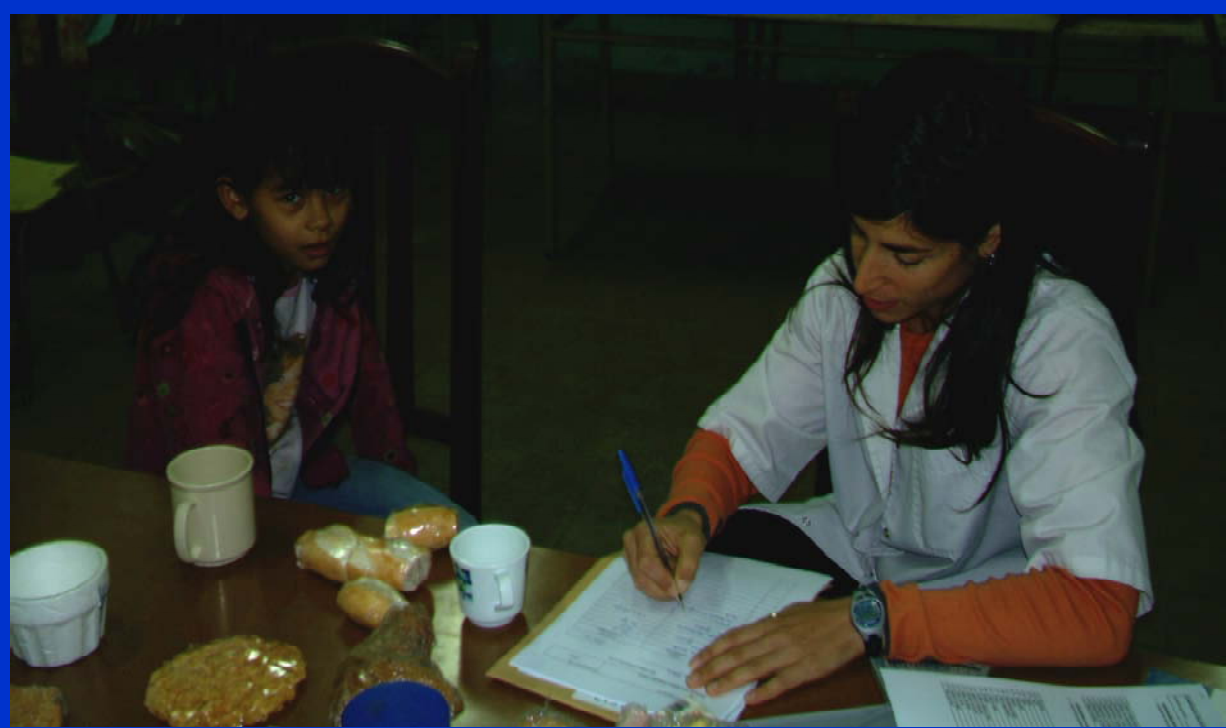
- Design
  - 2003-2005
- Implementation
  - June-December 2005
- Data analysis and entry
  - January-August 2006



## Design: Team

- General Program Coordination: Dra Irina Kovalskys
- Nutrition Assessment: Lic Vanina Ugalde
- Anthropometry and Physical Activity Assessment: Mg.Francis Holway
- Statistics: Lic. Maria José De Gregorio.
- ILSI: Juan Carlos Lopez Musi
- 3 Secretaries
- 20 Nutritionists

# Sample / Methods



# Sample

- 80 public schools in Buenos Aires City and the outskirts
- 20% (N: 16) from Urban / City (relating to population density)
- All 5th grade students
- One thousand six hundred and ninety-two cases ( 1692)
- Distribution : 3 layers. Each layer includes several census segments (pursuant to overcrowding indicators)
- Drawing lots for censal segments
- Drawing lots for schools within each censal segment

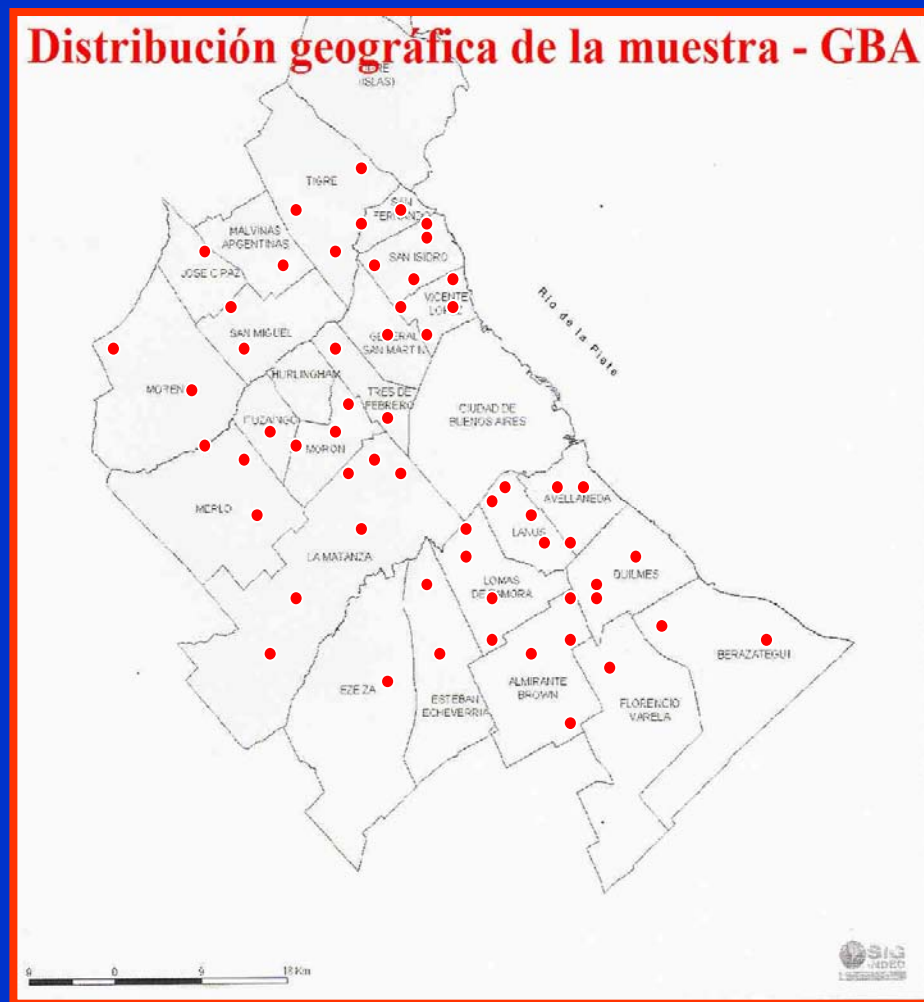
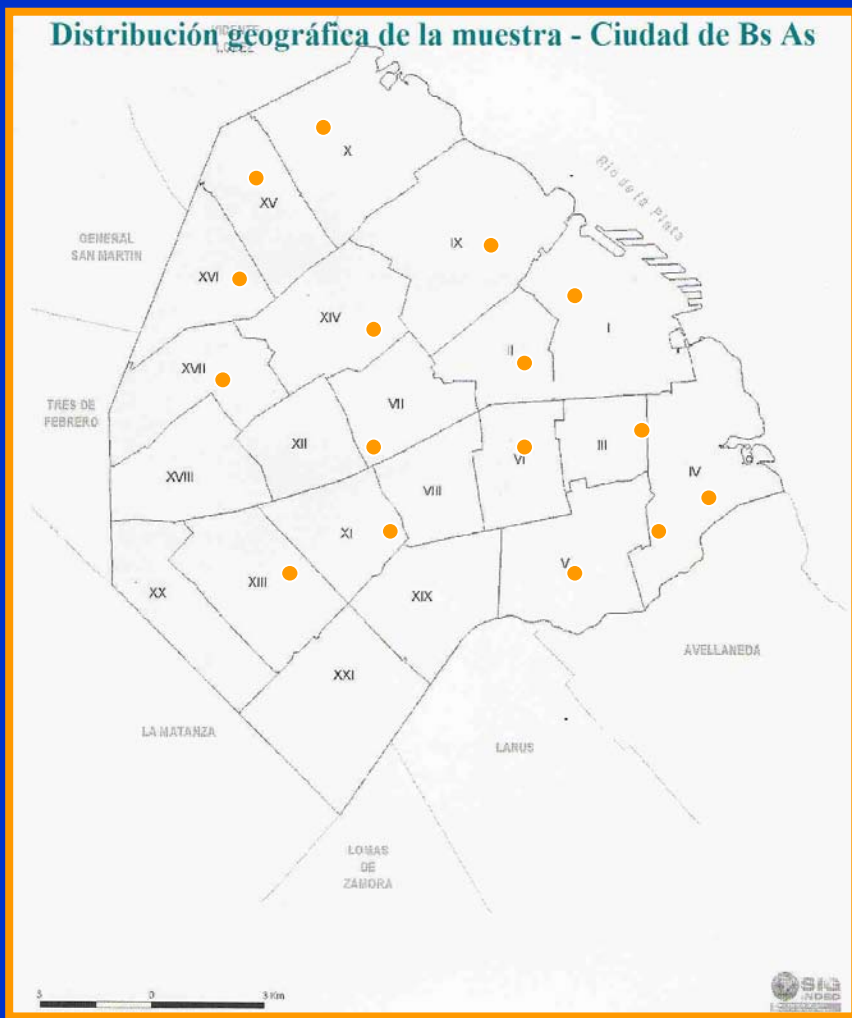
I  
Middle Income  
Class

II  
Low Middle  
Income Class

III  
Low Income &  
Under Poverty  
Line Class

- Buenos Aires City

- Outskirts ( Metropolitan Area)



El diseño utilizado, al haber sido elaborado sobre la base de la selección sistemática de fracciones censales y localidades ordenadas según hacinamiento, *asegura una muestra representativa que reproduce proporcionalmente el perfil socioeconómico de la población bajo análisis.*

## Methods

- Kineantropometry:
  - Portable Scales CAM
  - Stadiometers: Seca body meter 208
  - Measurement Tapes: Sanny
  - Caliper: Gaucho-Pro (Rosscraft)
  - Measurement Protocol:
    - International Society for the Advancement of Kinanthropometry (ISAK)
  - Field Evaluators:
    - Nivel 2 (ISAK)



# Methods



- Physical Activity:
  - Questionnaire
  - Based on Western Australia Child and Adolescent Physical Activity and Nutrition Survey (2003). (Culturalized: Pilot Study)
  - Accelerometer CALTRAC
    - 24 hrs sub-sample of 289 kids



# Intake



## ➤ 24 hr Recall

- Implemented by a trained nutritionist
- Quantitative data collected on energy, macronutrients, and some micronutrients.
- High Specificity: open questionnaire
- Utilized food models, photos and actual practice behavior examples for students to estimate portions consumed

# Food Intake

## ➤ Food frequency questionnaire

- Cuestionario cerrado
- Elaboración propia
- Utilizado para obtener patrones de ingesta habitual  
datos cualitativos
- Consistió en un listado de alimentos y/o productos  
que están mas fuertemente asociados al  
desarrollo de sobrepeso y obesidad
- Distintas categorías de tiempo  
de frecuencia semanal de consumo



## Intake References

Ambos métodos han sido ampliamente utilizados y validados para obtener información sobre la ingesta alimentaria:

- ❑ NCHS – NHANES (National Health and Nutrition Examination Survey)
- ❑ Nationwide Food Consumption Surveys. Guenther et al. 1994
- ❑ Multiple Risk Factor Intervention Trial. Dolecek et al. 1997
- ❑ Lipid Research Clinics coronary Primary Prevention Trial. Dennis et al. 1980
- ❑ Dietary Intervention Study in Children. Van Horn et al. 1993
- ❑ Child and Adolescent Trial for Cardiovascular Health. Lytle et al. 1993
- ❑ Differences in dietary Intake and Activity Level between Normal-weight and Overweight or Obese Adolescent. Garaulet, M; Martinez A et al. 2000

# Results



# Overweight prevalence in Boys and Girls

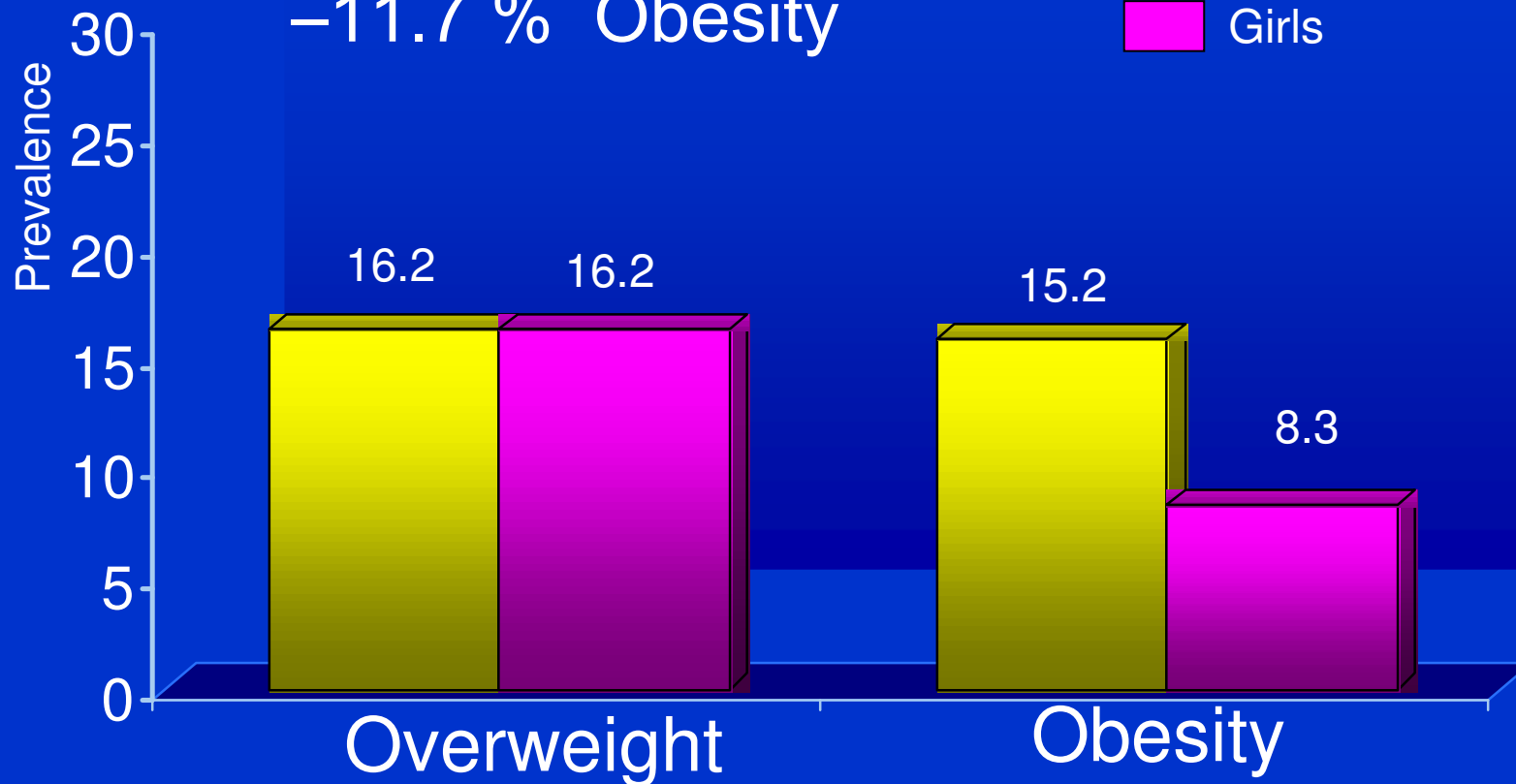
Prevalence in both sexes

-16.2% Overweight

-11.7 % Obesity

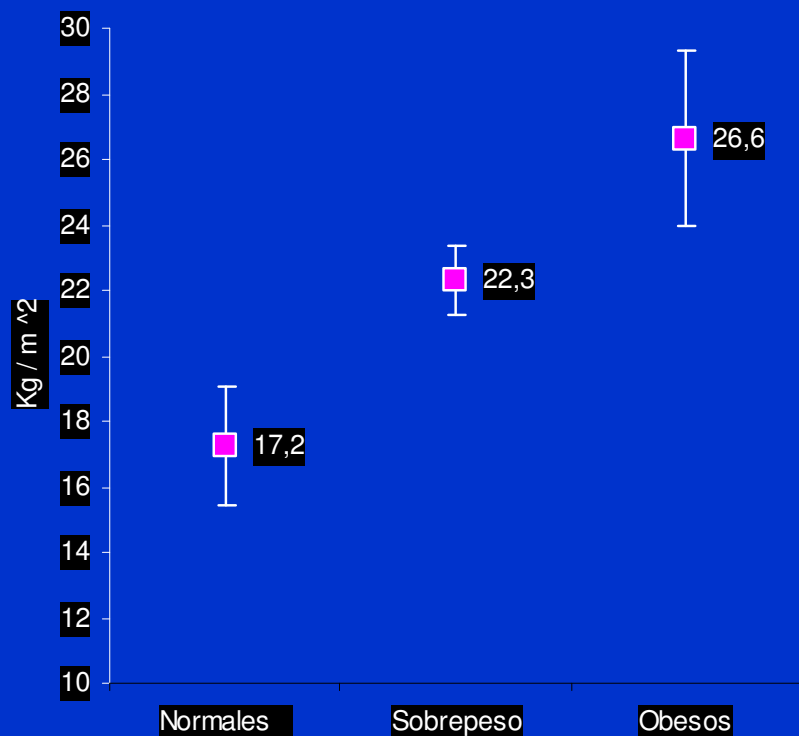
Boys

Girls



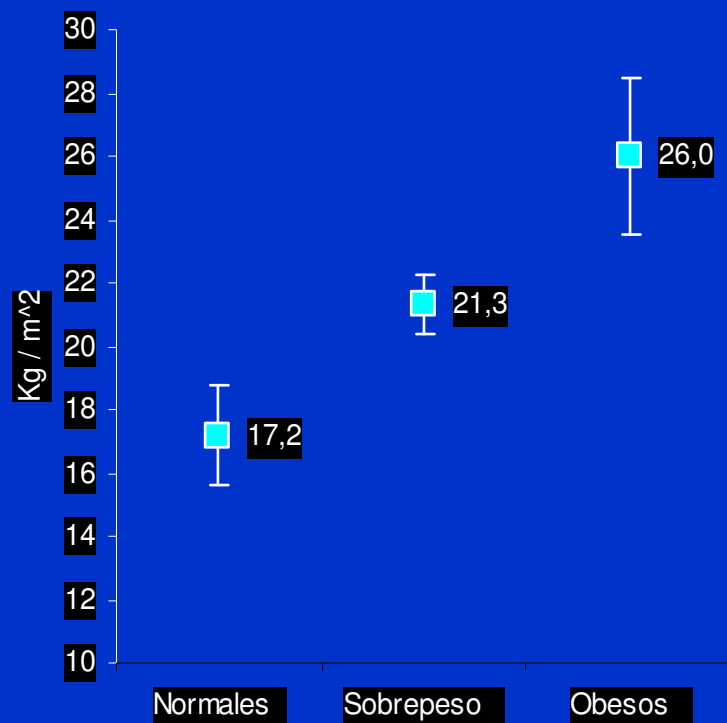
# Anthropometric data: BMI (Kg\*m<sup>-2</sup>)

niñas



$p < 0,001$

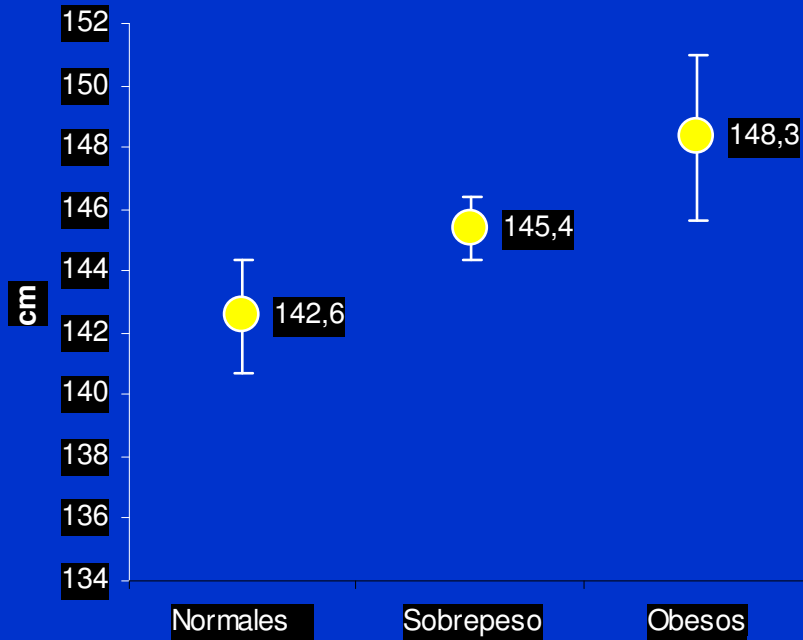
varones



$p < 0,001$

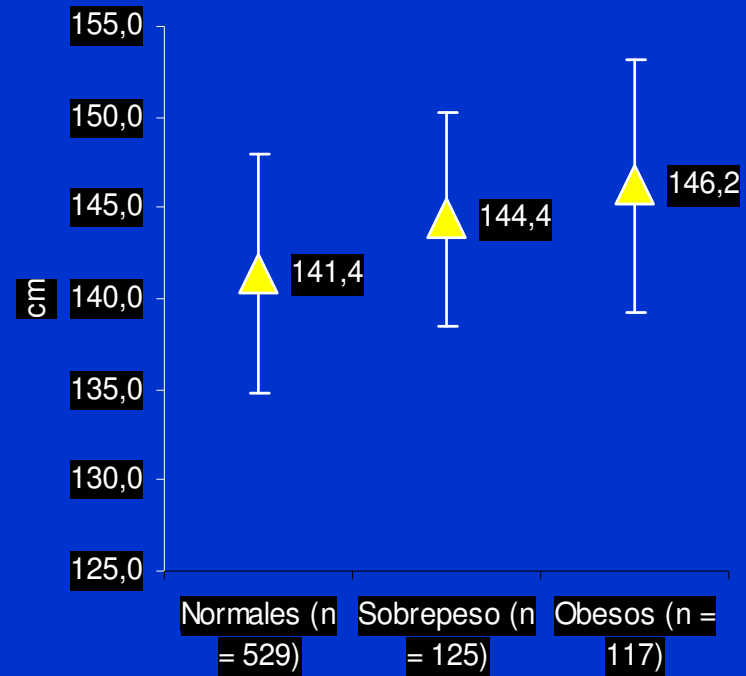
# Anthropometric data: Height (cm)

niñas



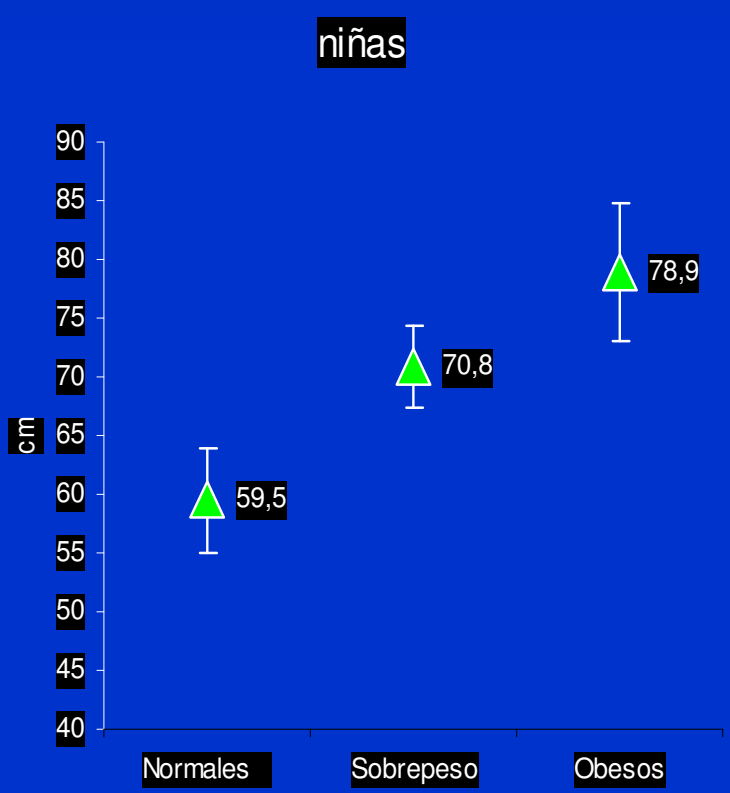
$p < 0,001$

varones

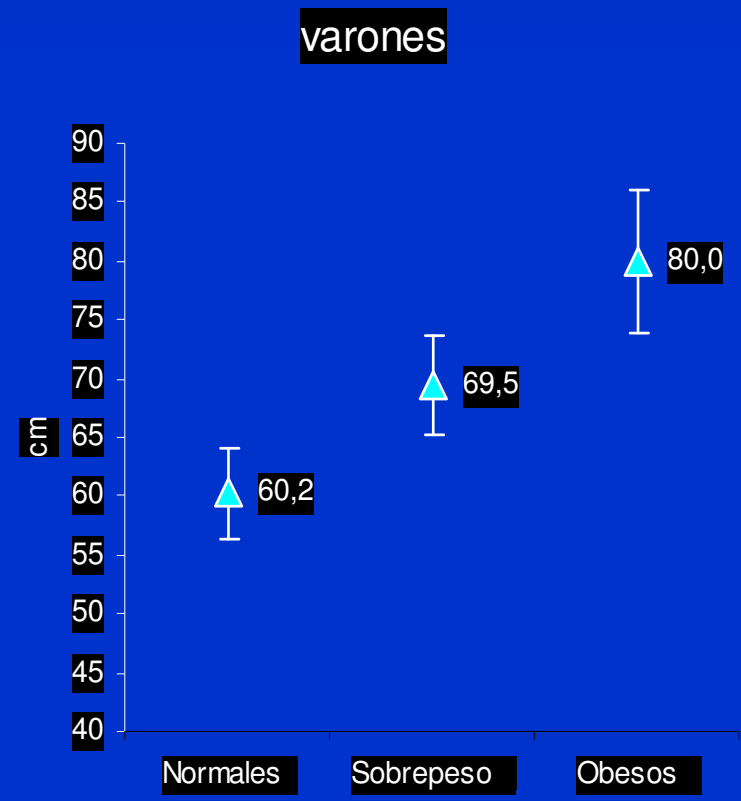


$p < 0,001$

# Anthropometric data: Waist Circumference (cm)

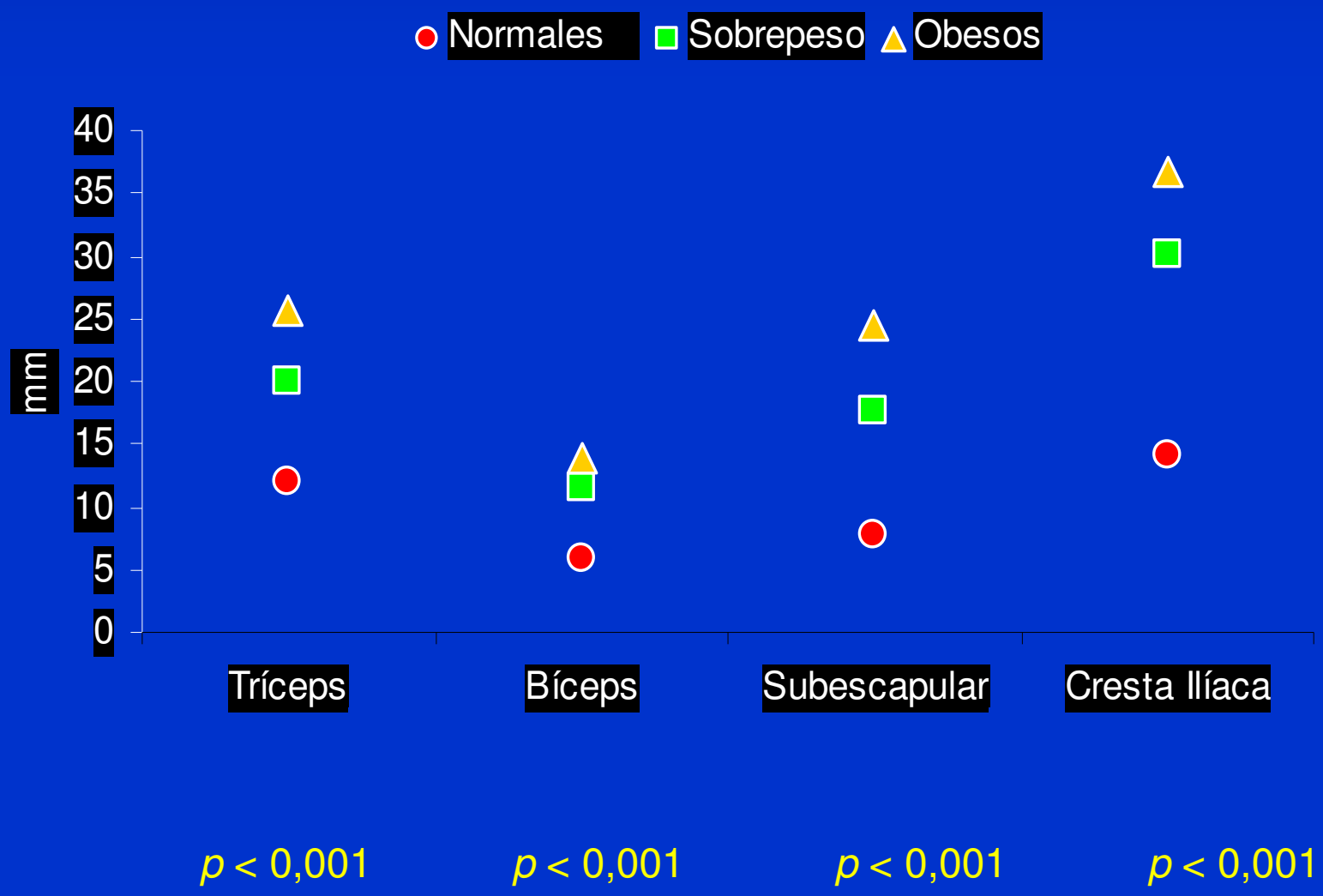


$p < 0,001$

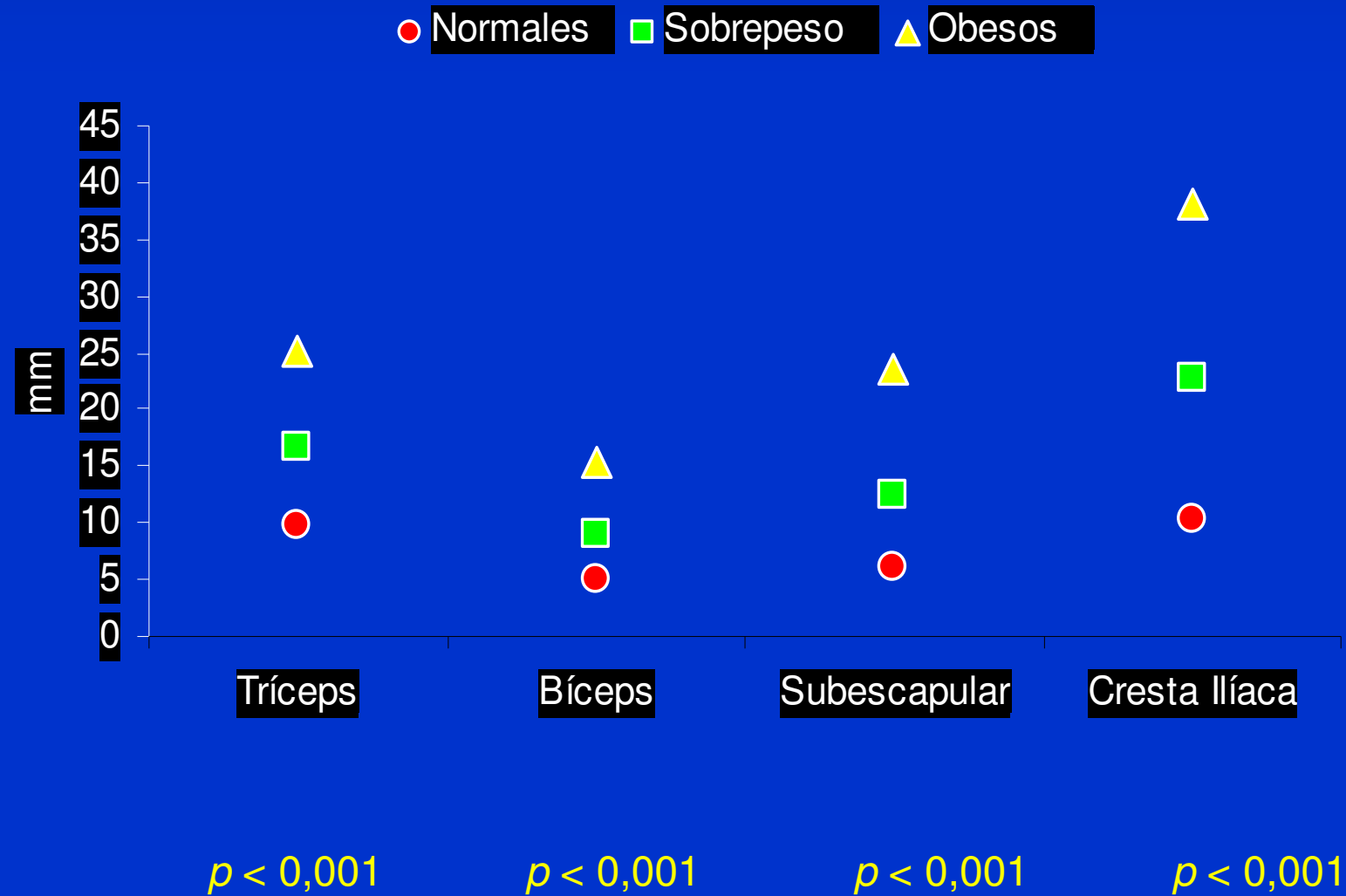


$p < 0,001$

# Skinfolds (mm): Girls



# Skinfolds (mm): Boys

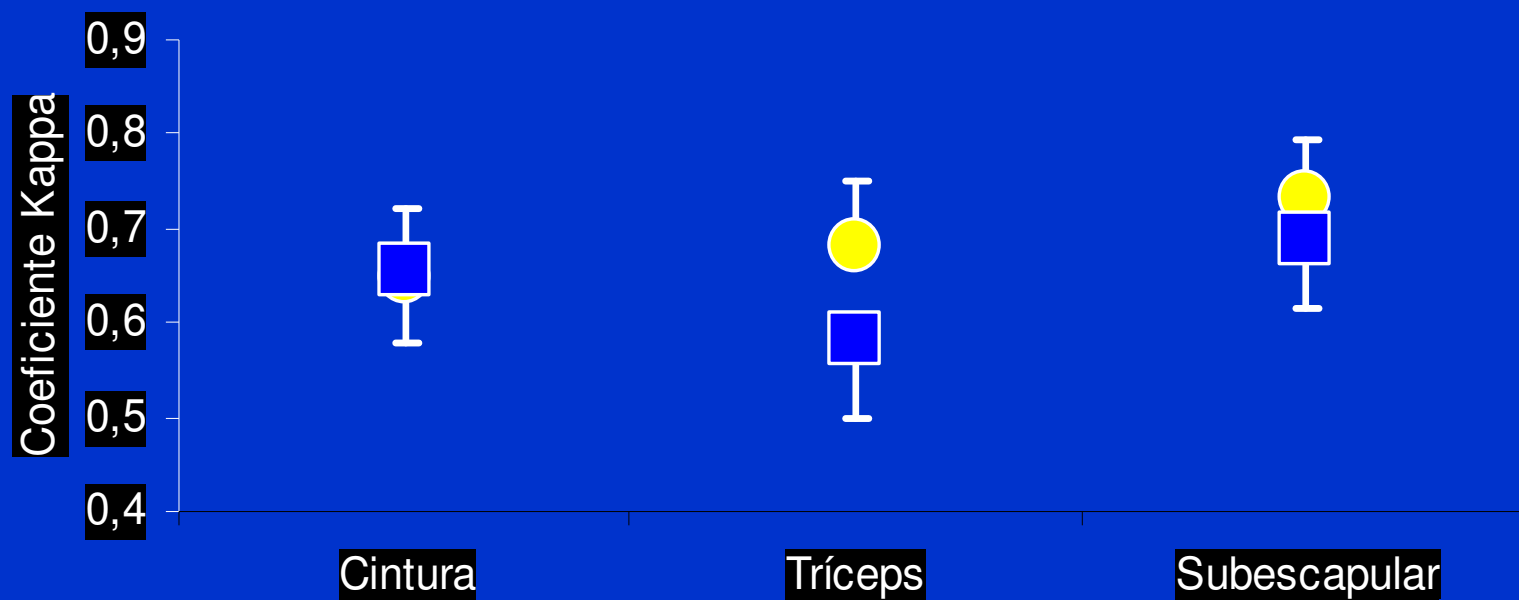


# Grado de concordancia entre herramientas para identificar sobre-peso:

**IMC, cintura, pliegues tríceps y subescapular**

Coeficiente Kappa; valor e IC 95%

● varones (n = 606) □ niñas (n = 640)



# Relationship between parent and children weight: boys

	None parent	One parent	Both parent
weight ( kg)	35	38	42 ( p=0.000)
Height( cm)	141	142	143 ( p= 0.036)
BMI ( P/T2)	17.4	18.7	20.3 ( p=0.000)
Odds Ratio	-	1.9	3.9
% children with OW	12	29	44 (p=< 0.05)

# Relationship between parent and children weight: girls

	None parent	One parent	Both parent
weight ( kg)	36,28	37,96	40,45 ( p=0.021)
Height( cm)	143	142	143 ( p= 0.036)
BMI ( P/T2)	17.58	18.45	19,34 ( p=0.000)
Odds Ratio	-	1.9	3.9
% children with OW	13	21	29 (p=< 0.05)

# Dietary Intake



Energy, macronutrients and fiber intake in comparison with RDI recommendations

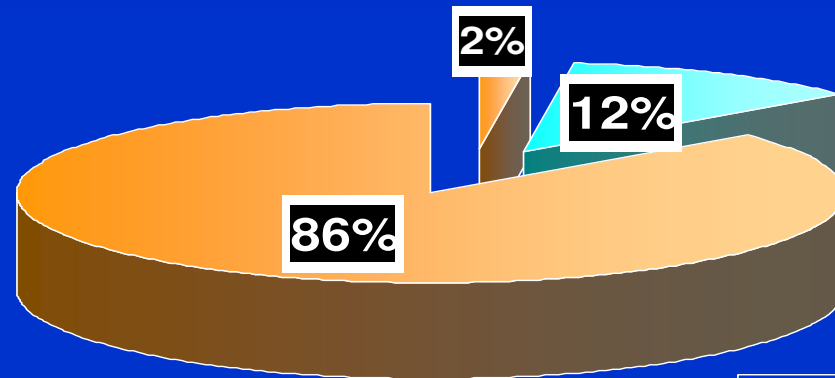
	D.R.I *	Results
Energy ( kcals)	2000	<b>2332</b>
Proteins ( %)	10-15	<b>15</b>
(gr/d)	<i>(47-71)</i>	<b>87</b>
CHO ( %)	45-65	<b>54</b>
(gr/d)	<i>(213-308)</i>	<b>300</b>
Fat ( %)	25-35	<b>31</b>
(gr/d)	<i>(52.7-73)</i>	<b>87</b>
Fiber ( grs/ d)	28	<b>9.7</b>

\*RDI .2002 Food and Nutrition Board, Institute of Medicine, Nacional Academies.

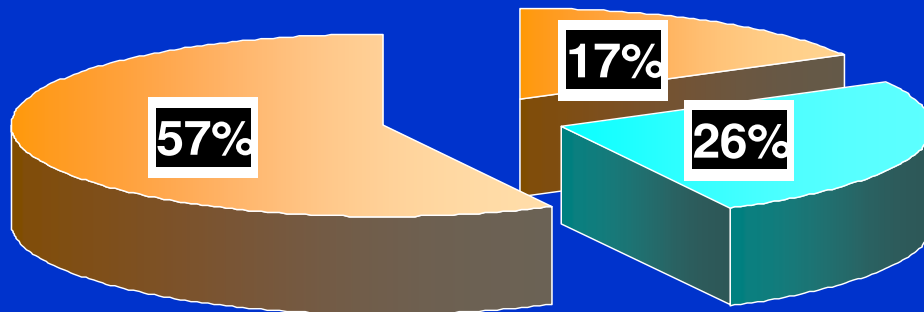
# Dietary Intake

Frequency distribution of responses to selected foods: vegetable and fruit intake

## Vegetables



## Fruits



- Adequate
- Acceptable
- Inadequate

\*



# Dietary Intake



## Frequency distribution of responses for select foods

>3/wk

- mayonnaise/  
butter
- cookies
- candies
- sweetened  
beverage

1-3/wk

- fiambres
- empanadas/  
pizza
- fried product
- snacks
- cake/pancake
- muffins

<1/wk

- hamburgers
- hot dog
- ice cream

# Dietary Intake



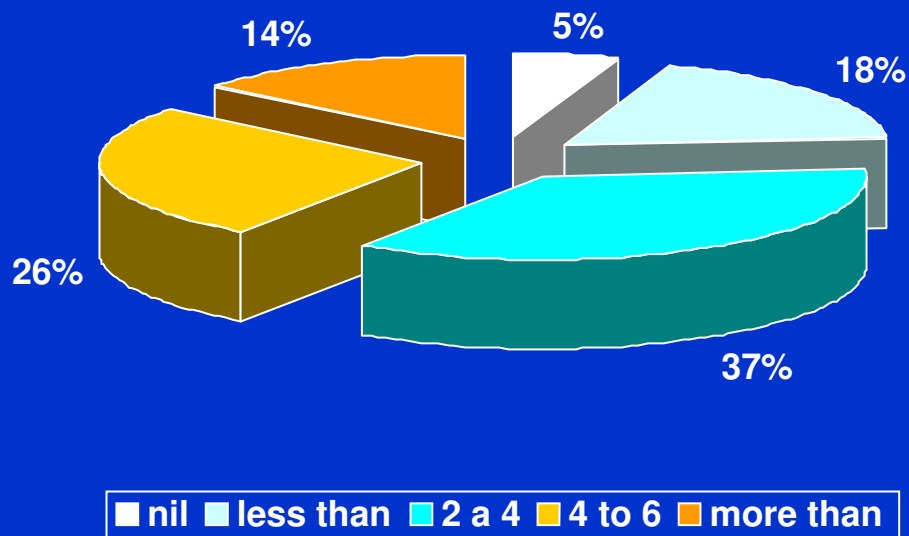
Energy and macronutrients intake for both groups

	Normal weight	Overweight *
Energy ( kcals)	<b>2397± 882</b>	<b>2103± 868</b>
Proteins ( %)	14.8	15.2
(gr/d)	91± 40	81.3 ± 38
CHO ( %)	53.9	52.8
(gr/d)	318.8±118	274.3±118
Fat ( %)	31.2	31.8
(gr/d)	86.4±45	77.5±44

## Amount of Physical Activity (PA): evaluated at different times during the day

- Breaks: 46.3% seated most of the time, 25.5% seated or walked a little, 25% played or ran most of the time
- PA classes at school: 41% never get tired; 38.9% sometimes get tired, only 11% get frequently tired
- Sports activities after school: 20% attend soccer classes. Other sports are practiced by less than 5% of the population
- Leisure: leisure activities with movement take 45 min on average in the afternoon

## Prior Day: Hours Spent in front of Screens (TV, computers, video games, etc)



- 37% of pre-adolescent population spends **between 2 and 4 hrs** doing sedentary activities in front of screens.
- 40% spends more than **4 hrs** in such activities on a daily basis.
- Average hours in front of screens for whole sample : 3.26
- The average is higher in one shift students (3.40 hrs) than in double shift students (2.42 hrs)

## Physical Activity: Caltrac (quantitative method)

### Data obtained by Caltrac

- Caloric Expenditure: 24-hour movement
- 291 Children (202 normal weight, 55 overweight, and 34 obesity)
- Caloric Expenditure = 1888 kcals daily
- Physical activity level was estimated:

Total energy expenditure (TEE)  
resting energy expenditure (REE)



No significant differences were found between normal weight kids and their overweight counterparts, same results were found with both methods

# Conclusions

- Low rate of physical activity
- Low % of population doing sports activities
- High proportion of the day spent in front of screens
- Average of intake is 2332 Kcals/day: higher than required.
- Adequate distribution of macronutrients, low fiber and average of calcium intake: 700 mg.
- Dramatically low vegetable and fruit intake

## Conclusions related to weight

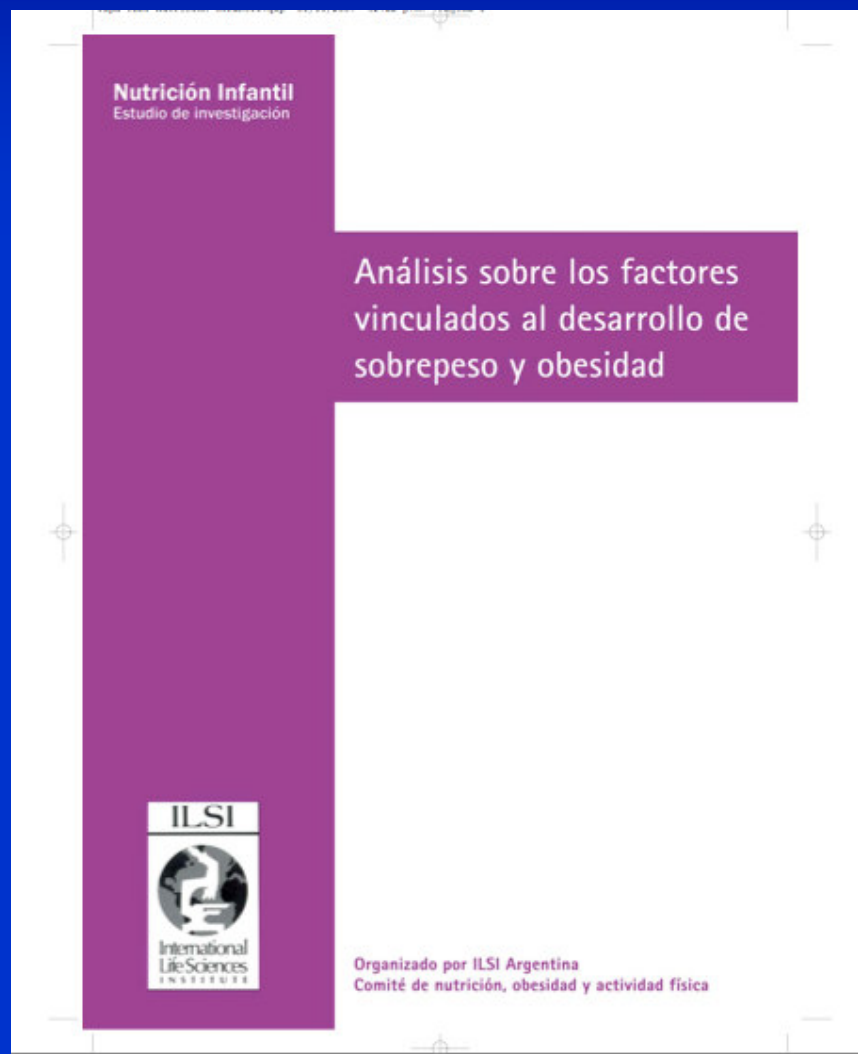
- Prevalence: 16.2% overweight and 11.7% obese
- More prevalent in boys ( 30.9% vs 24,5%)
- Normal weight children have similar energy expenditure than overweight kids, but low percentage of the whole population is active
- There is a direct association between BMI in children and the average of their parents' weight.

Although there are numerous international publications that show factors associated with childhood obesity, it is critical to study **LOCAL** factors. This information will allow a focus on the specific problems, save resources and enhance existing specific efforts.

# El equipo!



# The Report



March 2008