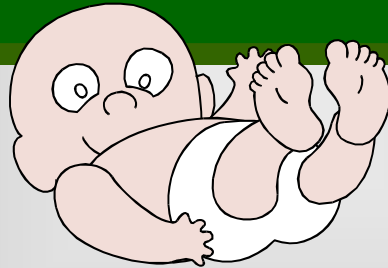


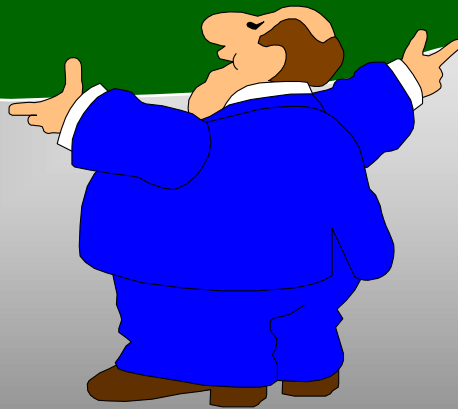
Obesity and Overweight in Saudi Children



Arjumand Warsy

Obesity and Overweight-Definition

Excessive deposition of fat in the body



- Most frequently encountered multifactorial, nutritional disorders.
- **Etiological factors**
 - **Genetic susceptibility (polygenic)**
 - **Environmental factors:**
 - Dietary habits
 - Life style
 - Lack of Physical activity
 - Smoking
 - etc.

- Variable in different populations and ethnic groups:
 - Highest - America
 - Lowest - Asia and sub-Saharan Africa
- More Common in:
 - developed countries
 - urban areas
 - children of mothers with higher education
 - girls
 - Some families

a familial disorder



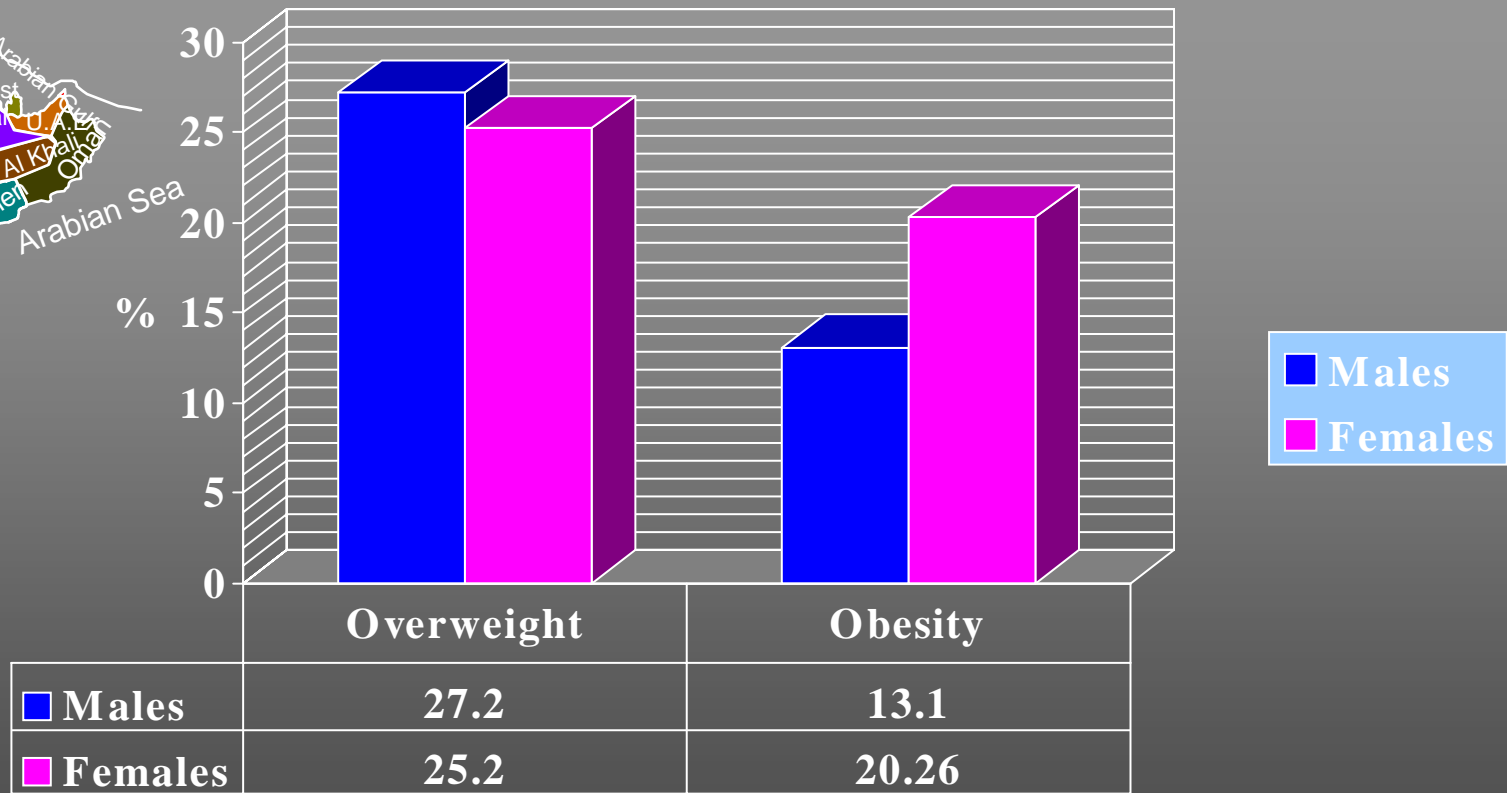
“Prevalence of child obesity is increasing rapidly worldwide”*

- **Childhood obesity is a serious public health problem.**
Obesity - an important underlying factor for development of:
 - hyperlipidaemia,
 - hypertension,
 - hyperinsulinaemia,
 - early atherosclerosis,
 - coronary artery disease,
 - asthma.
- **Childhood obesity must be closely monitored and prevented.**

*W.H.O. Report, Geneva 1998 (WHO/NUT/98.1)

Obesity and Overweight in Saudi Population

Prevalence of obesity and overweight in Saudi Adults*

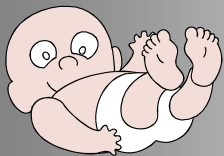


*El-Hazmi & Warsy. Ann Saudi Med. 1997; 17:302

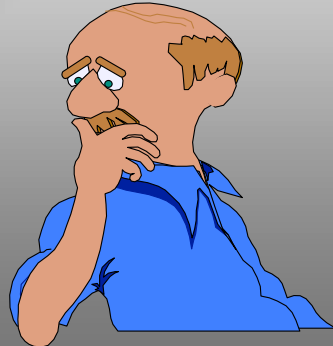
Findings

- Obesity and Overweight occur at a high prevalence among Saudi male and female adults.
- Prevalence of obesity is increasing with age in Saudis.

“Obese children grow to be obese adults”



What Is the frequency of obesity and overweight in Saudi Children?



Objectives

- To determine the prevalence of overweight and obesity in Saudi children.
- To compare the prevalence of overweight and obesity in Saudi children from different provinces.
- To compare the prevalence of overweight and obesity in Saudi children with that in other population groups.

Methods for Estimation of Obesity

- i) Body Mass Index: $\text{Weight}/\text{Height}^2$.
- ii) Skin fold thickness.
- iii) Waist-hip ratio.
- iv) Size and number of fat cells.
- v) Body density.

Obesity and Overweight-Measurement

In adults:

Body Mass Index (kg/m²) - most frequently used measure.

| | | | |
|--------------------------|-----------|---|------------|
| BMI (Kg/m ²) | : < 25 | → | Normal |
| | : 25-29.9 | → | Overweight |
| | : > 30 | → | Obese |

In Children:

In USA children, the BMI cut off values for overweight and obesity are considered as the 85th and 95th centiles of BMI for age and sex based on national representative survey data.

Objections: Why use USA as representative population?
Why use 85th and 95th centiles as cut off points?.

Obesity and Overweight -Measurement in children

- **International Obesity Task Force** (Am. J. Clin. Nutr. 1999; 70: 173-55) proposed that adult cut off points be linked to BMI centiles for children to provide **child cut off points**.
- **Cole & coworkers (2000)** - established a standard definition for child overweight and obesity worldwide.

Cole et al (2000)*

- Proposed a new definition of overweight and obesity in childhood, based on pooled international data for BMI and *linked to adult obesity cut off point of 30 kg/m².*
- Described age and sex specific cut off points for BMI using data set specific centile linked to adult cut off points.

This proposal is:

- Internationally based.
- Provide a means for comparison of prevalence rates internationally.

*BMJ 2000; 320: 1240-1243.

International cut off points for BMI for overweight and obesity, by sex, between 2-18 years
(Cole et al, 2000)

| Age (Yrs) | BMI | | | |
|-----------|----------------------|-------|----------------------|-------|
| | 25 Kg/m ² | | 30 Kg/m ² | |
| | Boys | Girls | Boys | Girls |
| 2 | 18.4 | 18.0 | 20.1 | 20.1 |
| 3 | 17.9 | 17.6 | 19.6 | 19.4 |
| 4 | 17.8 | 17.3 | 19.3 | 19.1 |
| 5 | 17.4 | 17.1 | 19.3 | 19.2 |
| 6 | 17.6 | 17.3 | 19.8 | 19.7 |
| 7 | 17.9 | 17.8 | 20.6 | 20.5 |
| 8 | 18.4 | 18.3 | 21.8 | 21.6 |
| 9 | 19.1 | 19.1 | 22.8 | 22.8 |

Contd...

International cut off points for BMI for overweight and obesity, by sex, between 2-18 years
(Cole et al, 2000) ... **Contd.**

| Age (Yrs) | BMI | | | |
|--------------|----------------------|-------|----------------------|-------|
| | 25 Kg/m ² | | 30 Kg/m ² | |
| | Boys | Girls | Boys | Girls |
| 10 | 19.8 | 19.9 | 24.0 | 24.1 |
| 11 | 20.0 | 20.7 | 25.1 | 25.4 |
| 12 | 21.2 | 21.7 | 26.0 | 26.7 |
| 13 | 21.9 | 22.6 | 26.8 | 27.8 |
| 14 | 22.8 | 23.3 | 27.8 | 26.6 |
| 15 | 23.3 | 23.9 | 28.3 | 29.1 |
| 16 | 23.9 | 24.4 | 28.9 | 29.4 |
| 17 | 24.5 | 24.7 | 29.4 | 29.7 |
| 18 | 25.0 | 25.0 | 30.0 | 30.0 |



Study Protocol

Household Screening

Different areas in different provinces of Saudi Arabia

Each area divided into many sectors

In randomly selected sectors

Every tenth road selected

Every tenth house selected

Study Protocol

Contd...



- Family contacted by phone.
- Study explained.
- Invited to join in the study (voluntarily)

Volunteers included ~ 95%

Decline rate < 5%

Requested to remain in fasting state on a mutually agreed date

- Early morning visit.
- History recorded.
- Height, weight, other parameters measured.
- Blood extraction.

- Study of DM.
- Study of HT.
- Study of Obesity and overweight in adults
- Others

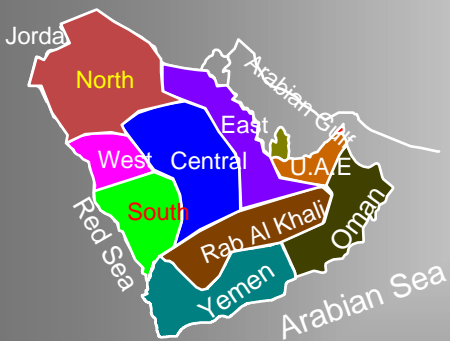
Children 1-18 years

Included in this investigation

Total No. of Children Investigated

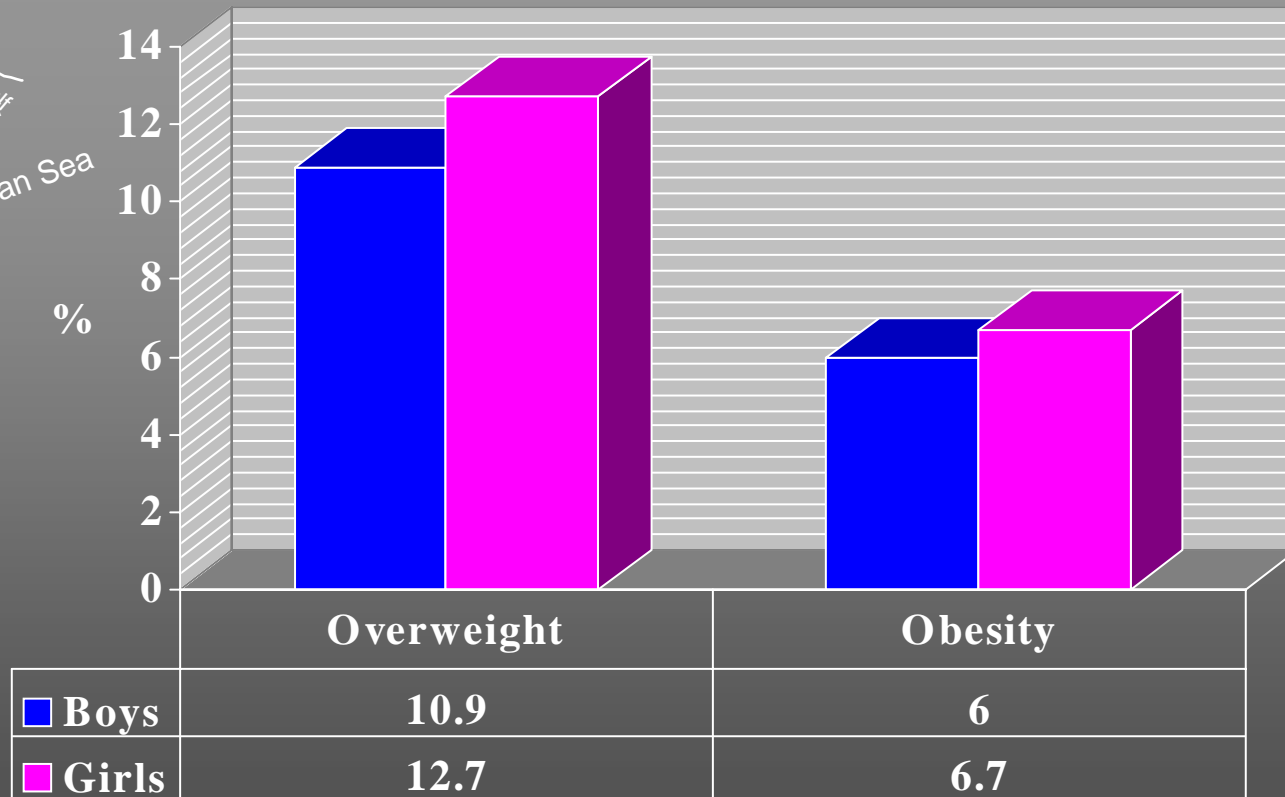
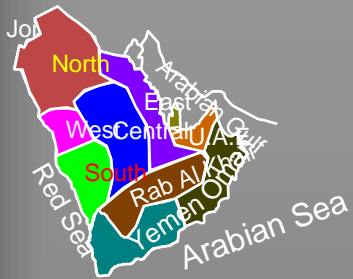
Total No. 12,701
Boys: 6,281
Girls: 6,420
Age Range: 1-18 years

Children from different provinces



| Province | Boys | Girls |
|------------|------|-------|
| • Central | 2055 | 2006 |
| • Western | 832 | 871 |
| • Eastern | 230 | 239 |
| • Northern | 948 | 961 |
| • Southern | 2216 | 2343 |

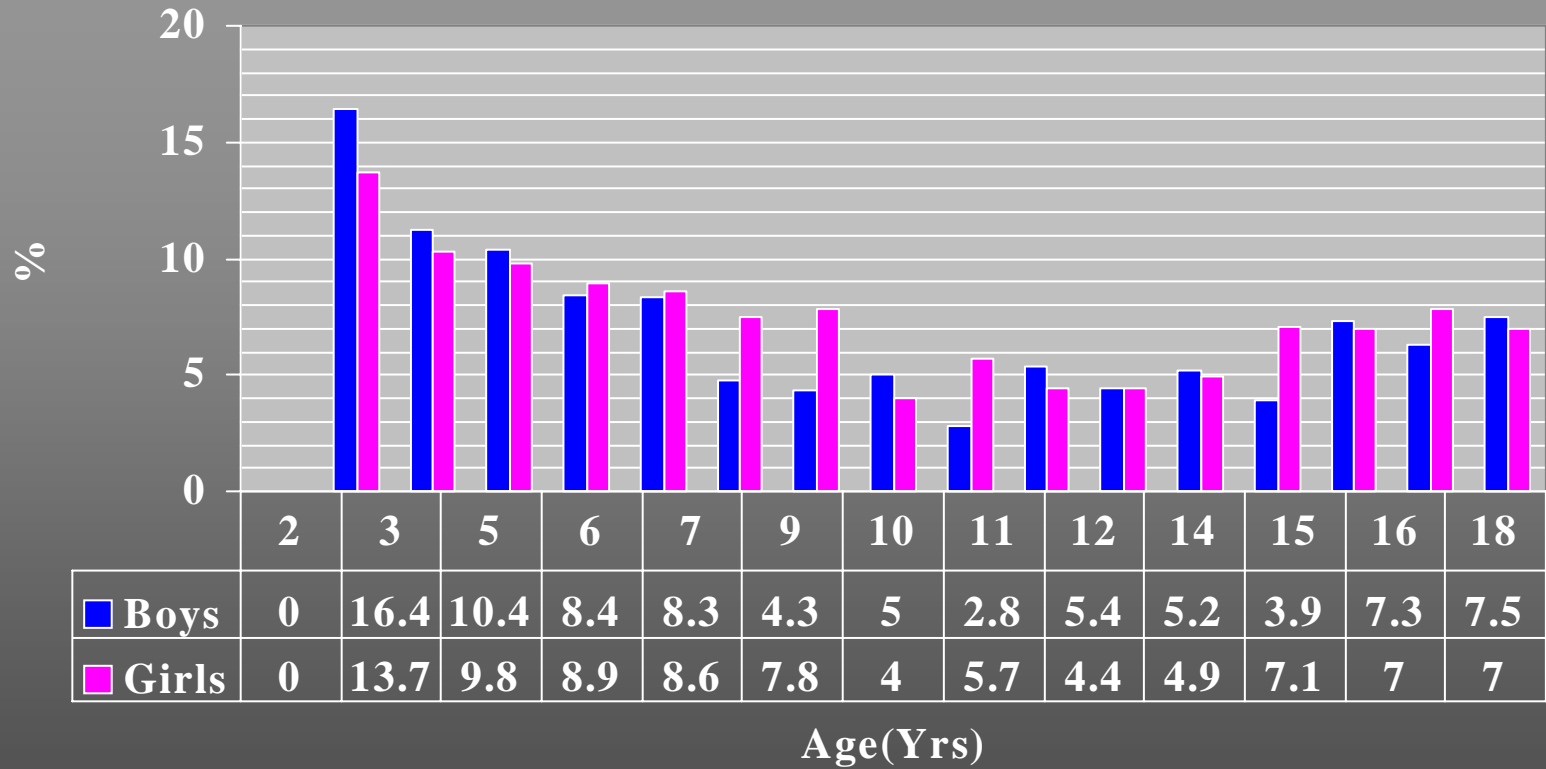
Prevalence of obesity and overweight in total Saudi children



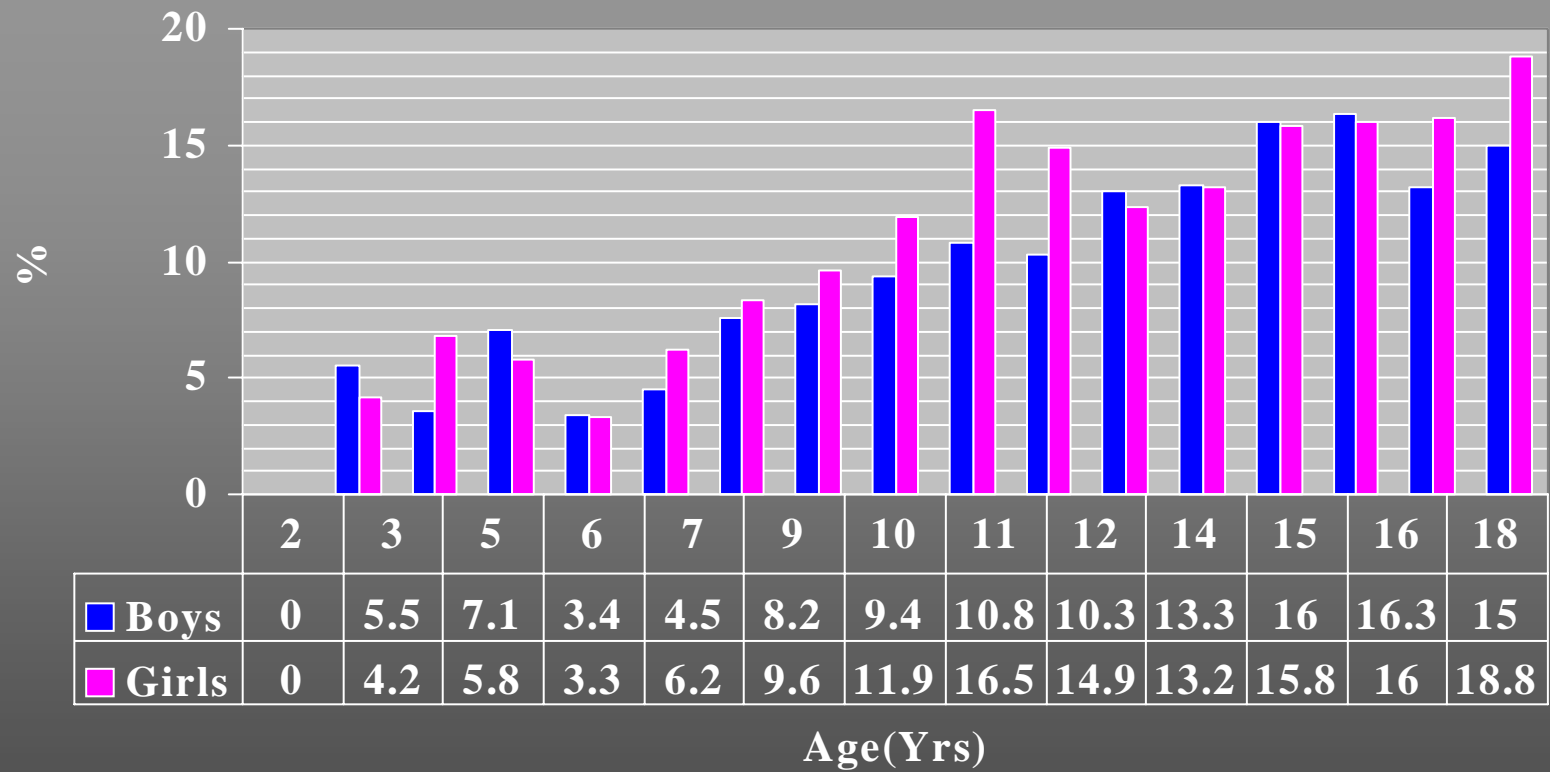
Prevalence of obesity and overweight in different age groups in Saudi children

| Age (Yrs) | Overweight (%) | | Obesity (%) | |
|-----------|----------------|-------|-------------|-------|
| | Boys | Girls | Boys | Girls |
| 1-6 | 4.58 | 4.7 | 10.0 | 9.8 |
| 6-12 | 8.65 | 11.54 | 4.96 | 6.26 |
| 12-18 | 14.50 | 15.64 | 5.8 | 6.9 |

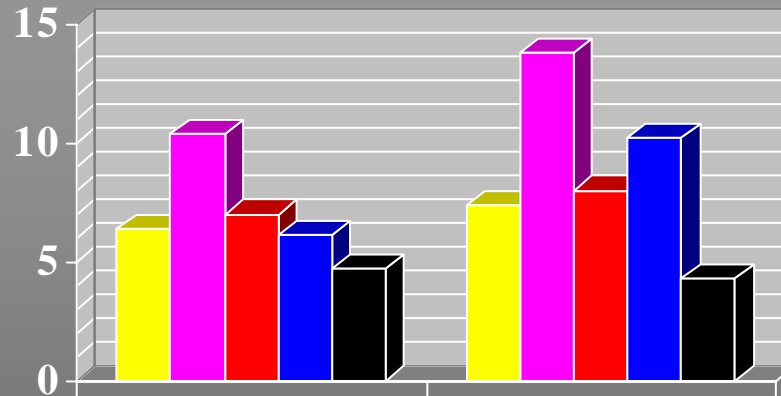
Prevalence of Obesity in children of different ages in Saudi Arabia



Prevalence of Overweight in children of different ages in Saudi Arabia

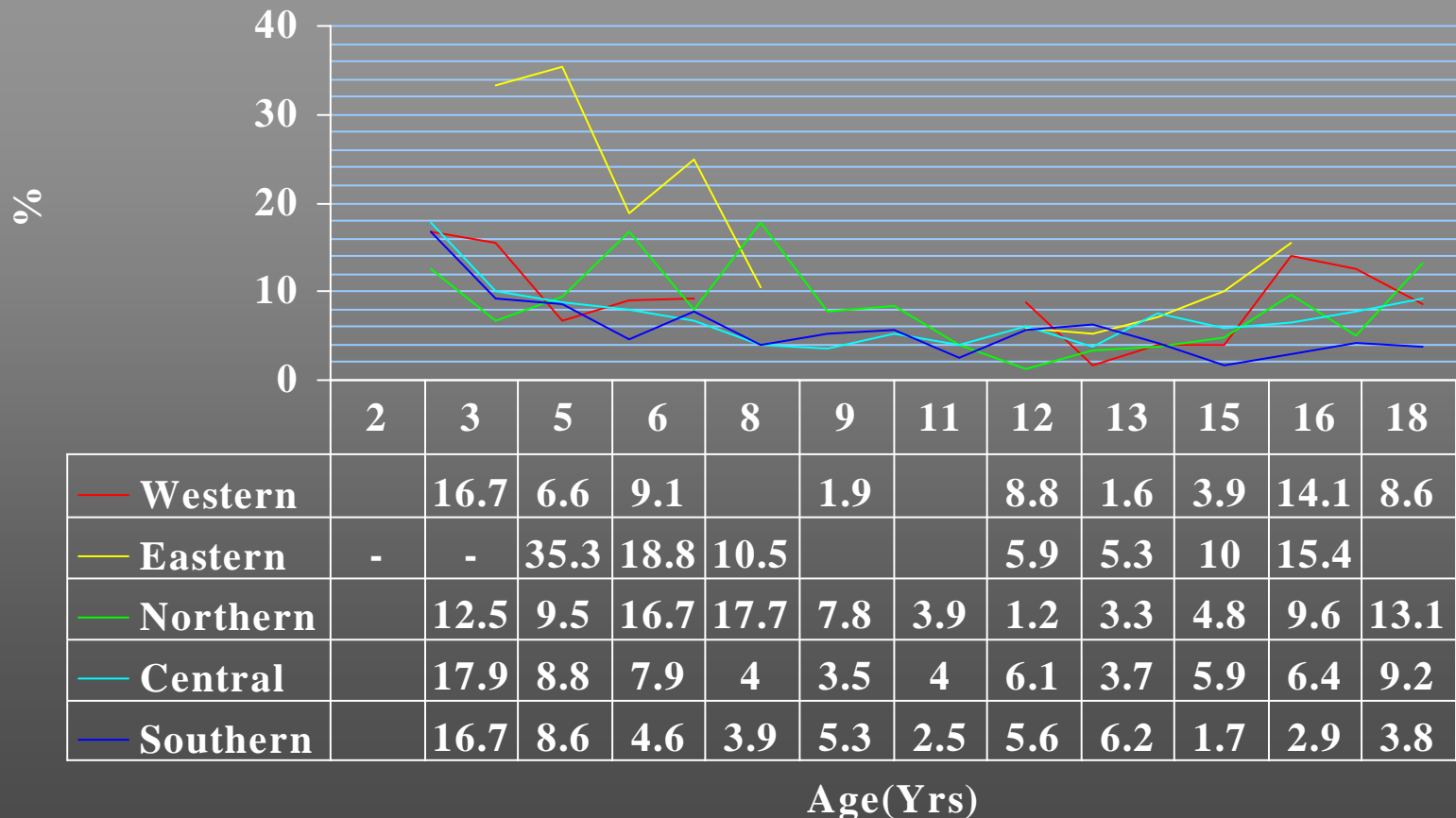


Prevalence of Obesity in children in different provinces of Saudi Arabia

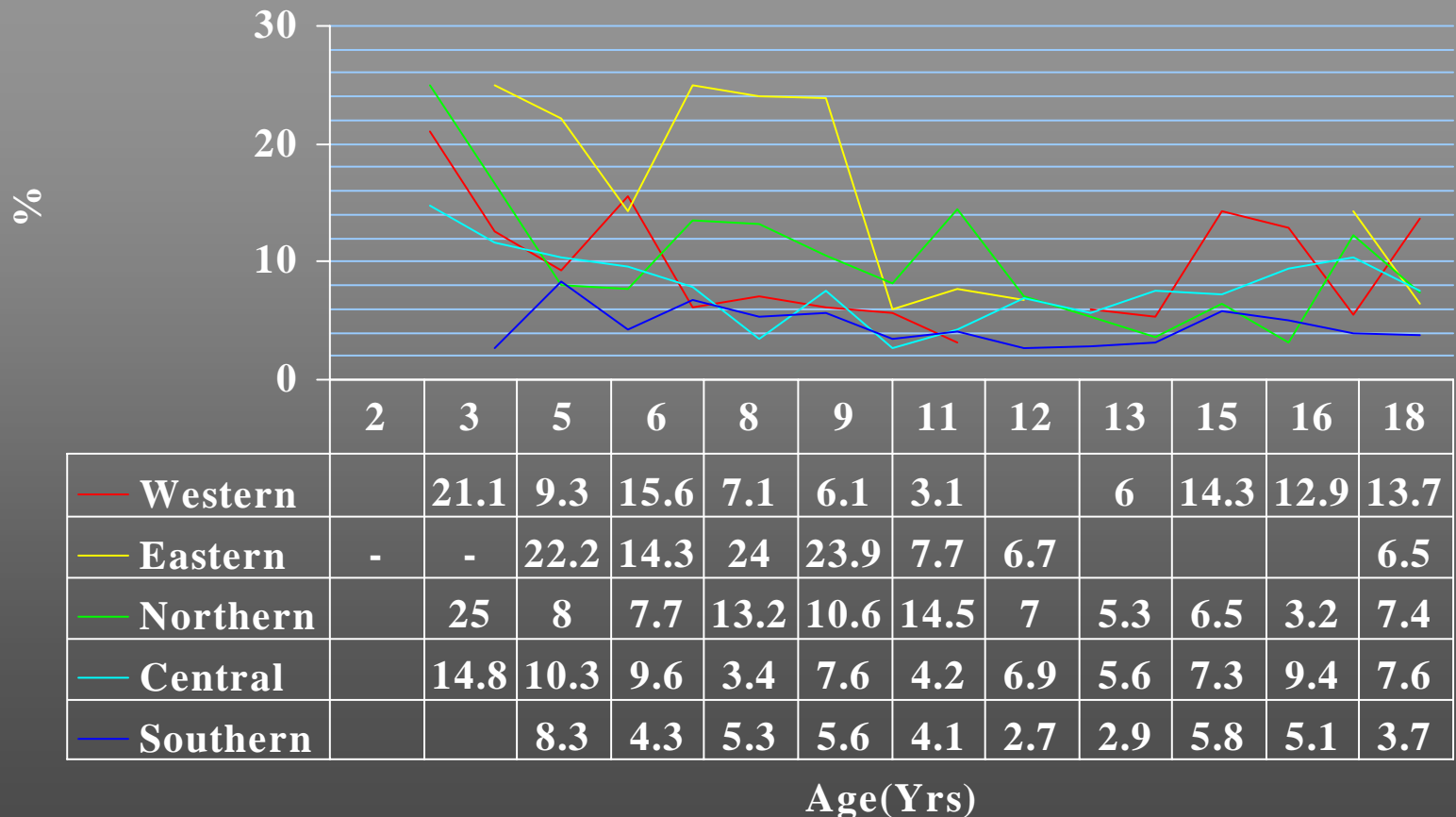


| | Boys | Girls |
|------------|------|-------|
| ■ Central | 6.4 | 7.4 |
| ■ Eastern | 10.4 | 13.8 |
| ■ Northern | 7 | 8 |
| ■ Western | 6.12 | 10.2 |
| ■ Southern | 4.7 | 4.3 |

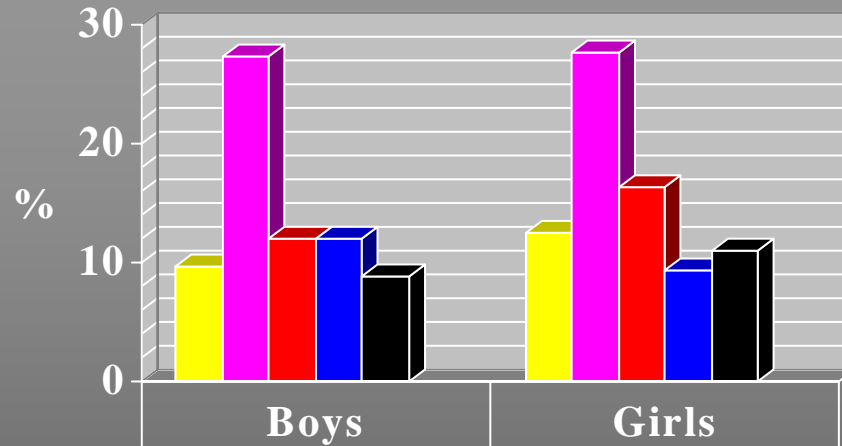
Prevalence of obesity in boys from different regions of Saudi Arabia



Prevalence of obesity in girls from different regions of Saudi Arabia

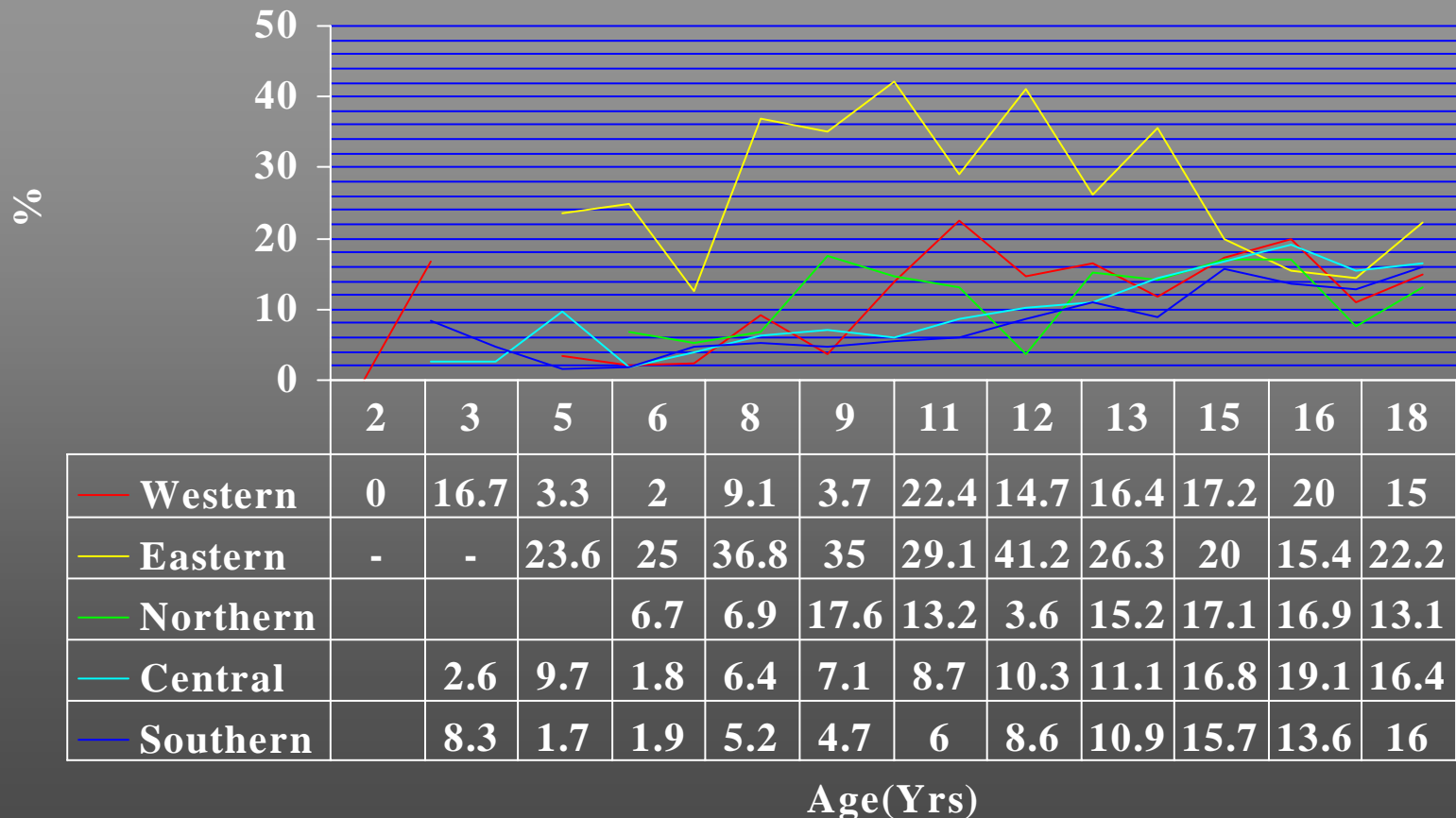


Prevalence of Overweight in children in different provinces of Saudi Arabia

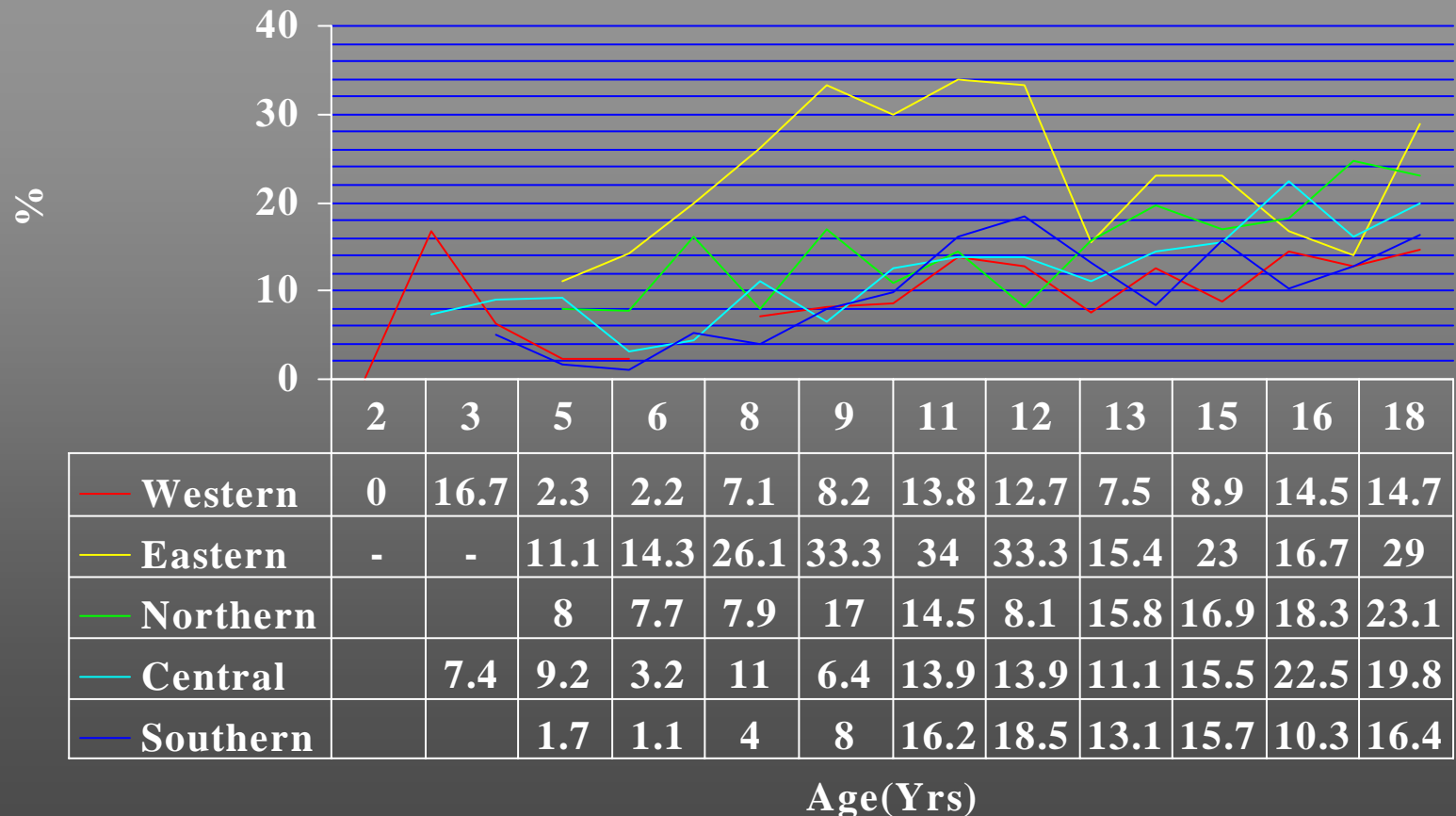


| | Boys | Girls |
|------------|------|-------|
| ■ Central | 9.7 | 12.5 |
| ■ Eastern | 27.4 | 27.6 |
| ■ Northern | 12 | 16.4 |
| ■ Western | 12 | 9.3 |
| ■ Southern | 8.8 | 11 |

Prevalence of Overweight in boys from different regions of Saudi Arabia



Prevalence of Overweight in girls from different regions of Saudi Arabia



Comparison of prevalence of overweight and obesity in Saudi children with children in other countries

| Country | Age Group | Gender | Overweight | Obesity |
|--------------|-----------|--------|------------|---------|
| Saudi Arabia | 1-18 | Boys | 10.9 | 6.0 |
| | | Girls | 12.7 | 6.7 |
| American | 7-14 | Boys | 38.0 | 16.0 |
| | | Girls | 33.0 | 13.0 |
| South Africa | 7-12 | Both | - | 16.7 |
| Canada | 2-19 | Boys | 27.7 | - |
| | | Girls | 33.7 | |
| Italy | 11-19 | Boys | 8 | 9.8 |
| | | Girls | - | 6.5 |
| | | Both | 2.4 | 8.5 |
| China | 0-7 | Boys | 4.2 | 2.2 |
| | | Girls | 4.2 | 1.9 |

Findings

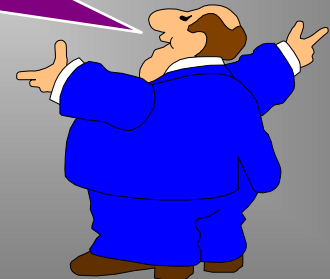
- The prevalence of obesity and overweight is **high in Saudi Children. Different Regions show significant** differences.
- The prevalence **varies with age** and obesity prevalence is highest in the 2-3 year old, decreases up to 8-13 years of age and then starts to increase again up to 18 years.
- The prevalence of obesity is not significantly different between boys and girls, but overweight shows significant differences.
- Compared to other countries Saudi Arabia occupies an **intermediate position** regarding both obesity and overweight.

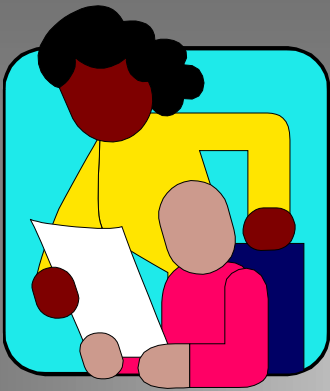
Recommendations

Control and prevention measures are necessary to prevent obesity and overweight in children and in adults.

This requires:

- * **Awareness Programs.**
- * **Early detection and intervention.**

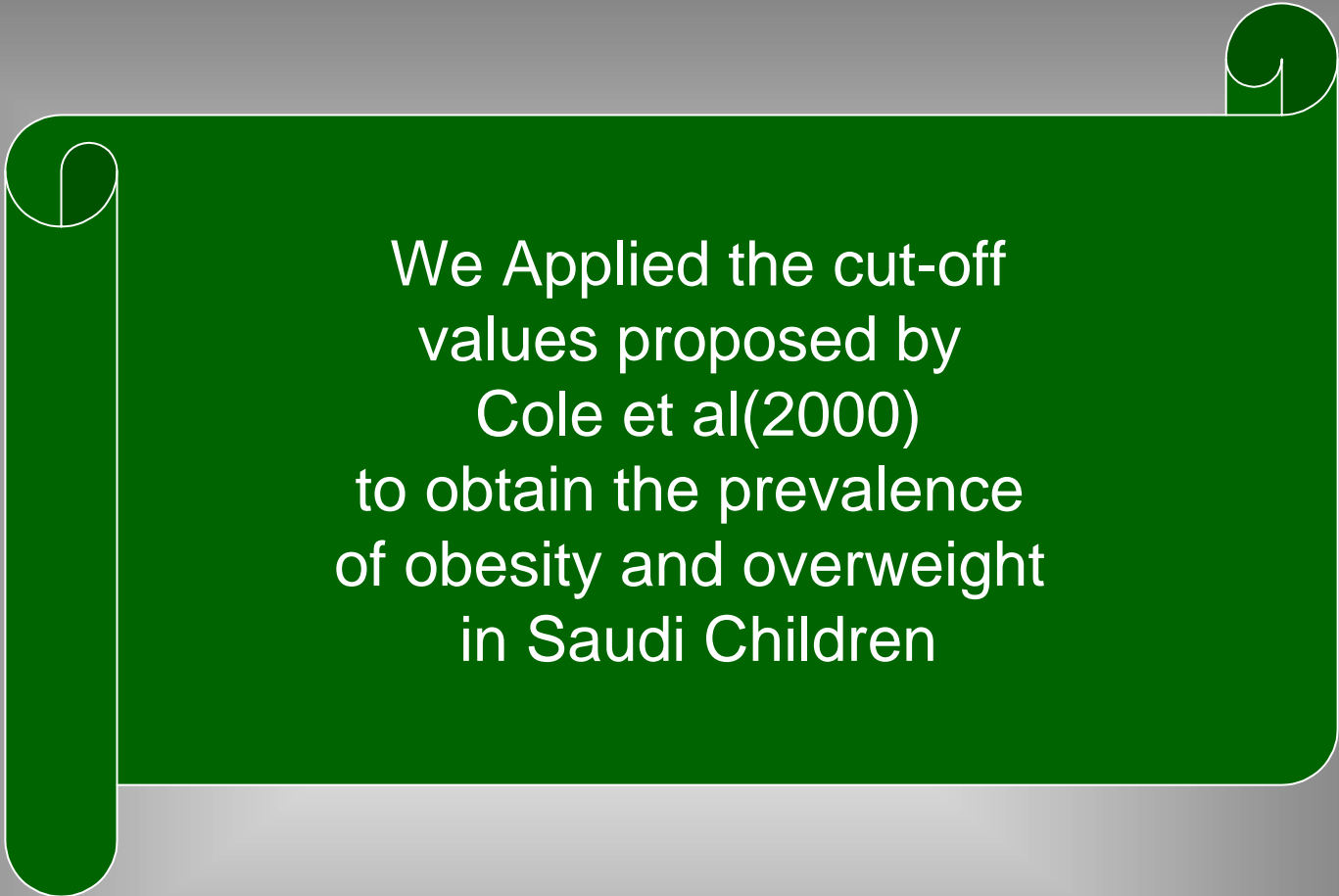




Recommendations

Awareness Programs :

- to increase knowledge about **causes** and **consequences** of overweight and obesity.
- to inform about the drawback of **FASTFOODS, SEDENTARY LIVING, OVEREATING.**
- to guide to a **healthy living** plan.



We Applied the cut-off
values proposed by
Cole et al(2000)
to obtain the prevalence
of obesity and overweight
in Saudi Children