



**In the Name of God  
The Most Merciful, The Most Beneficent**

**The Distribution and prevalence of  
Overweight and Obesity  
in Saudi Arabia**

**Arjumand Warsy**

# **Overweight and Obesity**

```
graph TD; A[Overweight and Obesity] --> B[Multifactorial disorders]
```

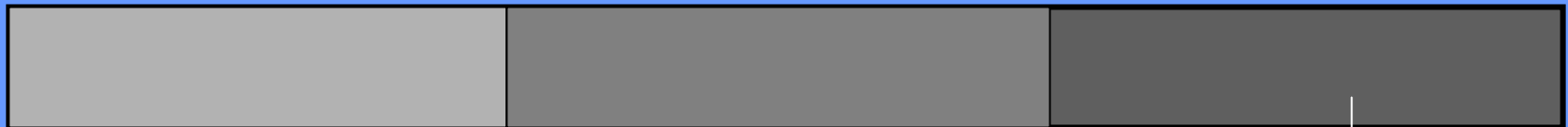
**Multifactorial  
disorders**

# Spectrum of Human Disease

Environmental  
(Common)

Multifactorial  
(Common)

Purely Genetics  
(rare)



Tuberculosis  
scurvy  
Bacterial  
Viral  
Nutritional

Spina bifida  
Ischaemic  
HD  
Ankylosing  
spondylitis  
Obesity

Peptic ulcer  
DM  
HT

PKU  
Galactosaemia  
Hemophilia  
SCD  
Thalassaemia  
DMD

# Multifactorial Disorders

- A large group of fairly **common disorders, partially genetic.**
- Do **not** obey **Laws of Mendelian Inheritance.**
- **Concentrate** in families.
- Have **multiple predisposing factors:**
  - Genetic
  - Environmental
- **Polygenic** – several contributing genes each with a small and additive effect it.
- Some are present at **birth** – congenital malformation.
- Others appear in **adult life.**

# Complex Disorders of Adult Onset

- Make up a large proportion of **clinical medicine**.
- Common **chronic** disorders.
- Account for much of **morbidity and mortality** in adults.
- **Include:**
  - Coronary artery disease.
  - Diabetes mellitus:
    - IDDM
    - NIDDM
  - Hypertension.
  - Cancer.
  - Manic-depressive psychosis.
  - Schizophrenia.
  - Obesity
  - Others.

# Obesity and Overweight

- Genetic disorders: Multifactorial disorders
- Most frequently encountered genetic defects
- Concentrate in families
- Pathogenesis:
  - Genetic factors: polygenic
  - Environmental factors:
    - Dietary habits
    - Life style
    - Lack of exercise

**National Project:  
“Study of Diabetes  
Mellitus in Saudis”  
AT-MW-10**



# Objective

**To investigate the prevalence of diabetes mellitus, obesity and hypertension in Saudi male and female population**

**Principal Investigator: Prof. Mohsen A.F. El-Hazmi**

**Co-Investigators: Prof. A.S.Warsy**

**Dr.**

**Dr.**

**Financed by:**

**- King Saud University**

**- King Abdulaziz City for Science  
Technology**

**- Ministry of Health.**



# Materials and Methods

## Population Screened:

- Household screening **[According to a statistically designed protocol]**
- Areas screened: **34**
- No. screened (adults): **14,660**
  - Males: **6162**
  - Females: **8498**
- Age range: **14-70 years**

# Materials and Methods (Contd.)

## Information Recorded:

- Age (years)
- Height (m)
- Weight (kg)
- Systolic and diastolic BP (mmHg)

## Investigations conducted:

- Fasting and 2 hr. post-glucose load blood glucose.

# Diagnosis of Diabetes Mellitus

- **Diabetes mellitus (W.H.O. 1985)**
  - **Fasting venous blood glucose  $\geq 6.7$  mmol/l  
and 2 hr post glucose-load  $\geq 10.0$  mmol/l  
(Further grouping into NIDDM, IDDM & MODY)**
- **Impaired glucose tolerance:**
  - **Normal fasting blood glucose  $< 6.7$  mmol/l  
and 2 hr post glucose load 6.7-10.0 mmol/l**

# Diagnosis of Obesity and Overweight

(W.H.O. 1988)

- Quetelet Index or BMI =  $\frac{\text{Weight (kg)}}{\text{Height}^2 (\text{m}^2)}$ 
  - Normal Weight =  $<25$
- Overweight:
  - BMI =  $25 - 29.9$
- Obesity
  - BMI =  $\geq 30$

# Diagnosis of Hypertension

## Hypertension:

- Systolic pressure: > 140 mmHg
- and/or Diastolic pressure: > 90 mmHg

# Results

The number of males and females with NIDDM, IDDM, IGT, MODY, overweight, obesity, hypertension were calculated and the prevalence of each abnormality was obtained.



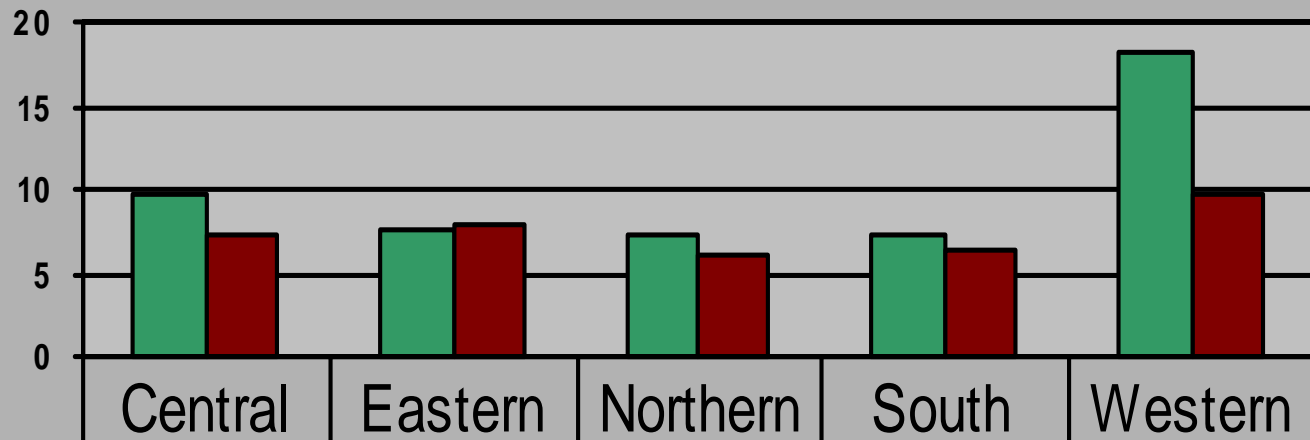
# Prevalence of Diabetes Mellitus, Overweight, Obesity and Hypertension in adult Saudi population

Disorders	Prevalence (%)	
	Males	Females
• Diabetes mellitus		
• IDDM	0.239	0.248
• NIDDM	9.50*	6.82*
• IGT	0.717	1.347
• Overweight	27.23*	25.20*
• Obesity	13.05*	20.26*
• Hypertension	5.39	3.65

\*p < 0.005

# Prevalence of NIDDM in different provinces of Saudi Arabia

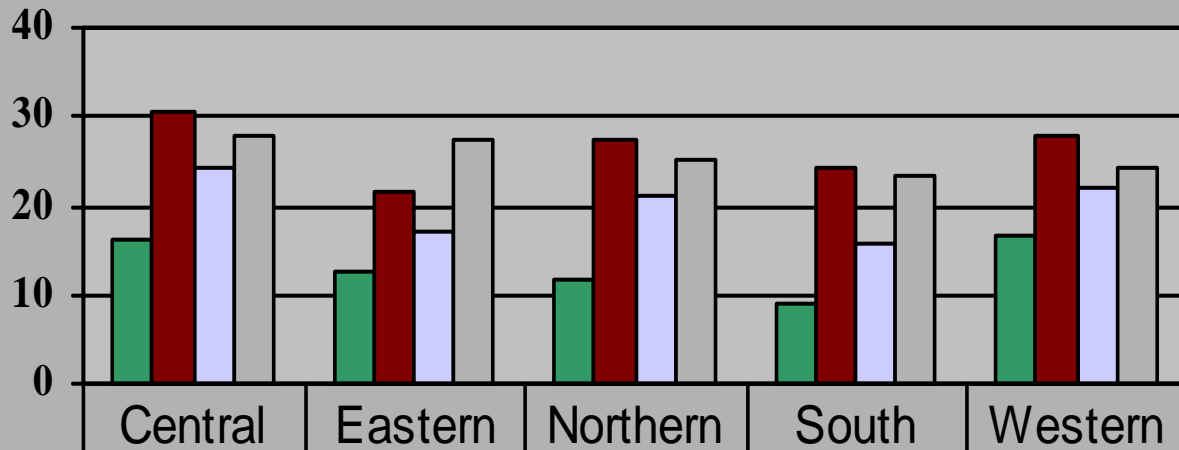
Prevalence (%)



■ Males	9.6	7.7	7.3	7.2	18.2
■ Females	7.2	7.9	6	6.3	9.7

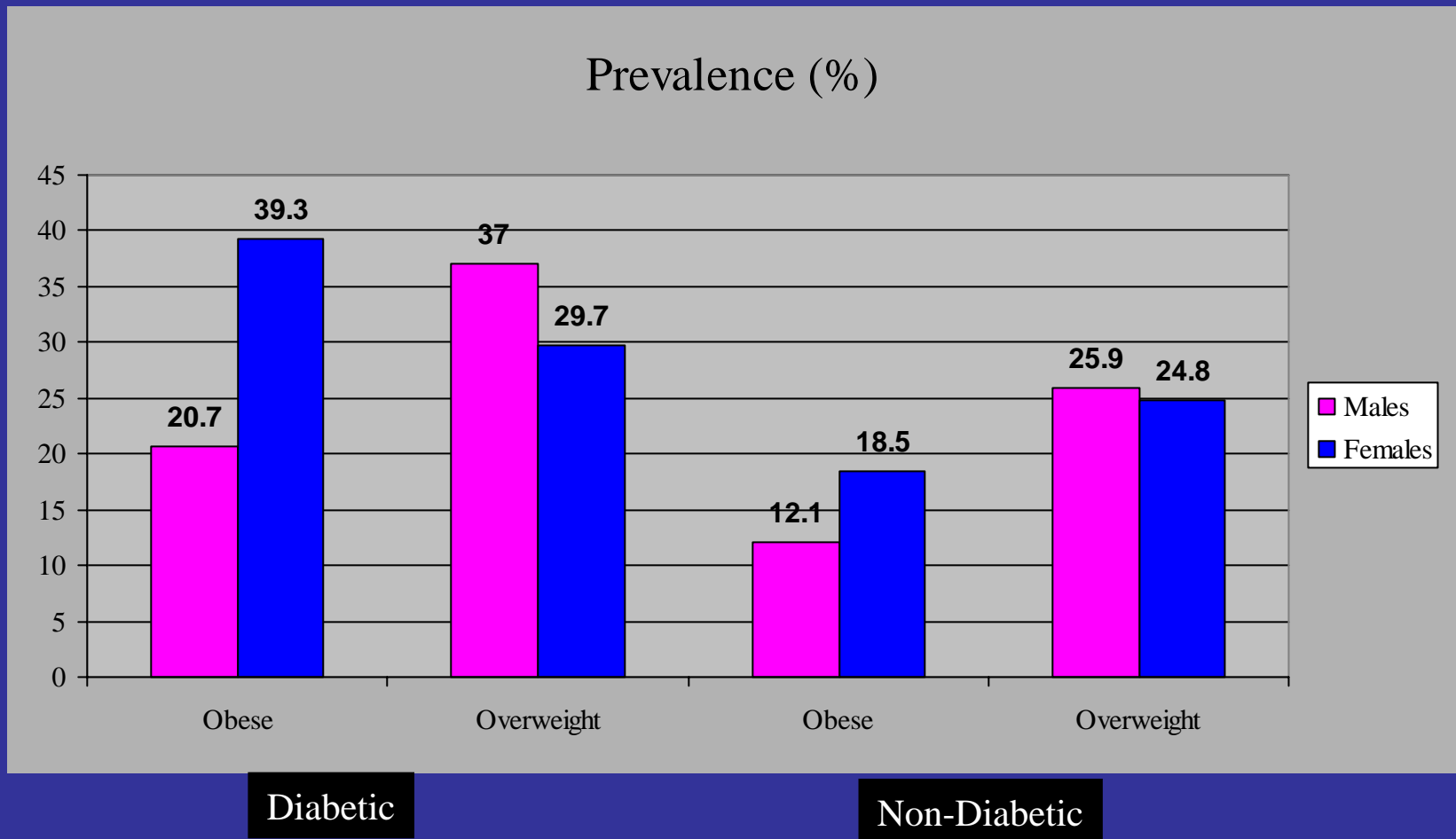
# Prevalence of obesity and overweight in different provinces of Saudi Arabia

Prevalence (%)



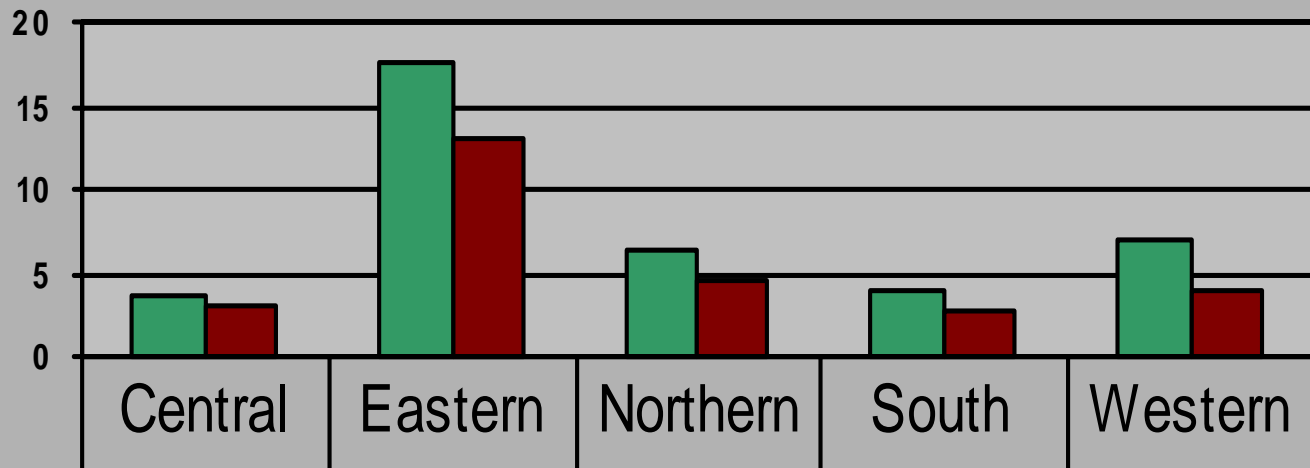
■ M(OW)	16	12.7	11.6	9.1	16.7
■ F(OW)	30.4	21.4	27.5	24.4	28
□ M(OB)	24.4	17	20.9	15.8	21.8
□ F(OB)	27.9	27.3	25	23.2	24.2

# Prevalence of obesity and overweight in total diabetic and non-diabetic Saudi population



# Prevalence of Hypertension in Saudi males and females in different provinces

Prevalence (%)  
Hypertension



■ Males	3.7	17.5	6.4	4	7.1
■ Females	2.9	13	4.5	2.6	3.8

# Conclusions

- Multifactorial disorders i.e. diabetes mellitus, obesity, overweight and hypertension occur at a high prevalence in Saudi males and females.
- The prevalence of these disorders increases significantly with age.
- In diabetic patients the prevalence of obesity, overweight and hypertension is significantly higher compared to the non-diabetic population.

# Recommendations

- There is an urgent need to control the prevalence of DM, obesity, overweight and HT in Saudis.
- Extensive awareness programs are required in order to implement control and prevention strategies.