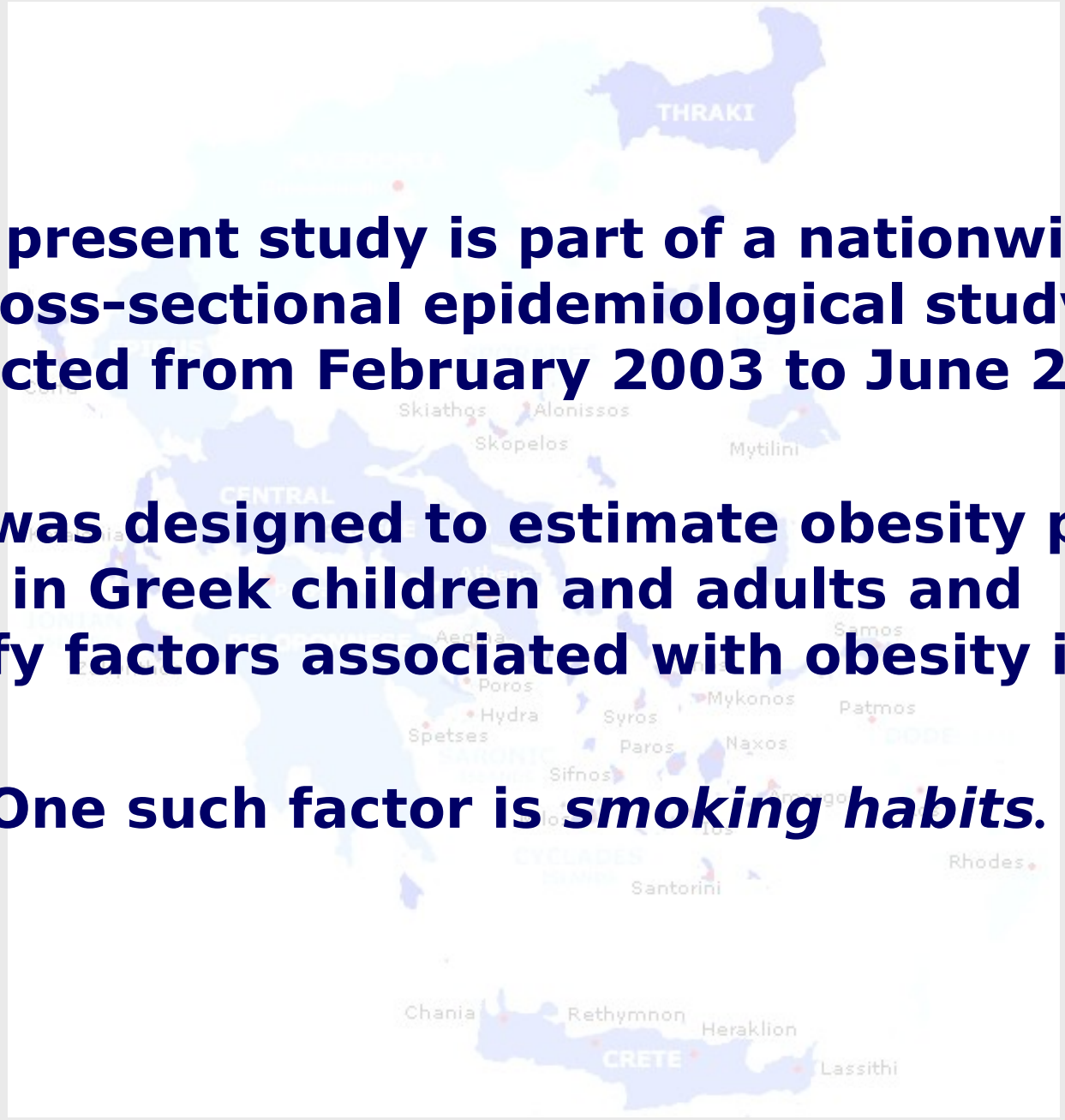
Smoking habits in Greek adults and their relation to body weight.

(Data from first national epidemiological large scale survey on the prevalence of obesity in Greece)

E. Chala, I. Kaklamanos, I. Ioannides,

T. Tzotzas, M. Kaklamanou and E. Kapantais

Hellenic Medical Association for Obesity (HMAO), Athens, Greece.



The present study is part of a nationwide, cross-sectional epidemiological study conducted from February 2003 to June 2003.

his study was designed to estimate obesity prevalenc in Greek children and adults and to identify factors associated with obesity indices.

One such factor is *smoking habits*.

Subjects and Methods (a)

- **Sample selection**: Data were collected by a questionnaire from all members of households, through their children aged 13-19 years, who had direct measurements at the secondary schools. The method used for school selection was that of proportionate stratified random sampling.
- **Procedure**: Gym instructors were trained on anthropometric techniques in order to help the children taking measurements at school, and explain them how to help their relatives to take the appropriate measurements.

Subjects and Methods (b)

- **Questionnaire:** Households received a sealed envelope with instructions and with a questionnaire seaking information on factors associated with obesity (socioeconomic status, dietary habits, physical activity status, smoking habits, etc)

Subjects and Methods (c)

	Male (8090)	Female (9313)
age	44.6±10.5	41.5±11.1

Subjects and Methods (d)

- **Weight (kg)**
- **Height (m)**

} ***Calculation of BMI (kg/m²)***

- **Waist circumference(cm)**
- **Hip circumference (cm)**

} ***Calculation of WHR (waist-to-hip ratio)***

Statistical analysis used SPSS version 11.5. Results on BMI, WC and WHR were calculated as mean±SD. Comparisons were made by student's t-test and non-parametric tests. Proportions were compared using the X^2 test. Multiple regression analysis was applied to estimate the contribution of various factors on the prediction of obesity indices.

WHO definitions for BMI

<18.5:	underweight
18.5-24.9:	normal weight
25.0-29.9:	overweight
>30.0:	obese
>40.0:	morbidly obese

Cut-off points of Waist Circumference

1st National Epidemiological Large Scale Survey on the

For men

<94cm: low risk

94-102cm: increased risk

>102cm: substancially increased risk

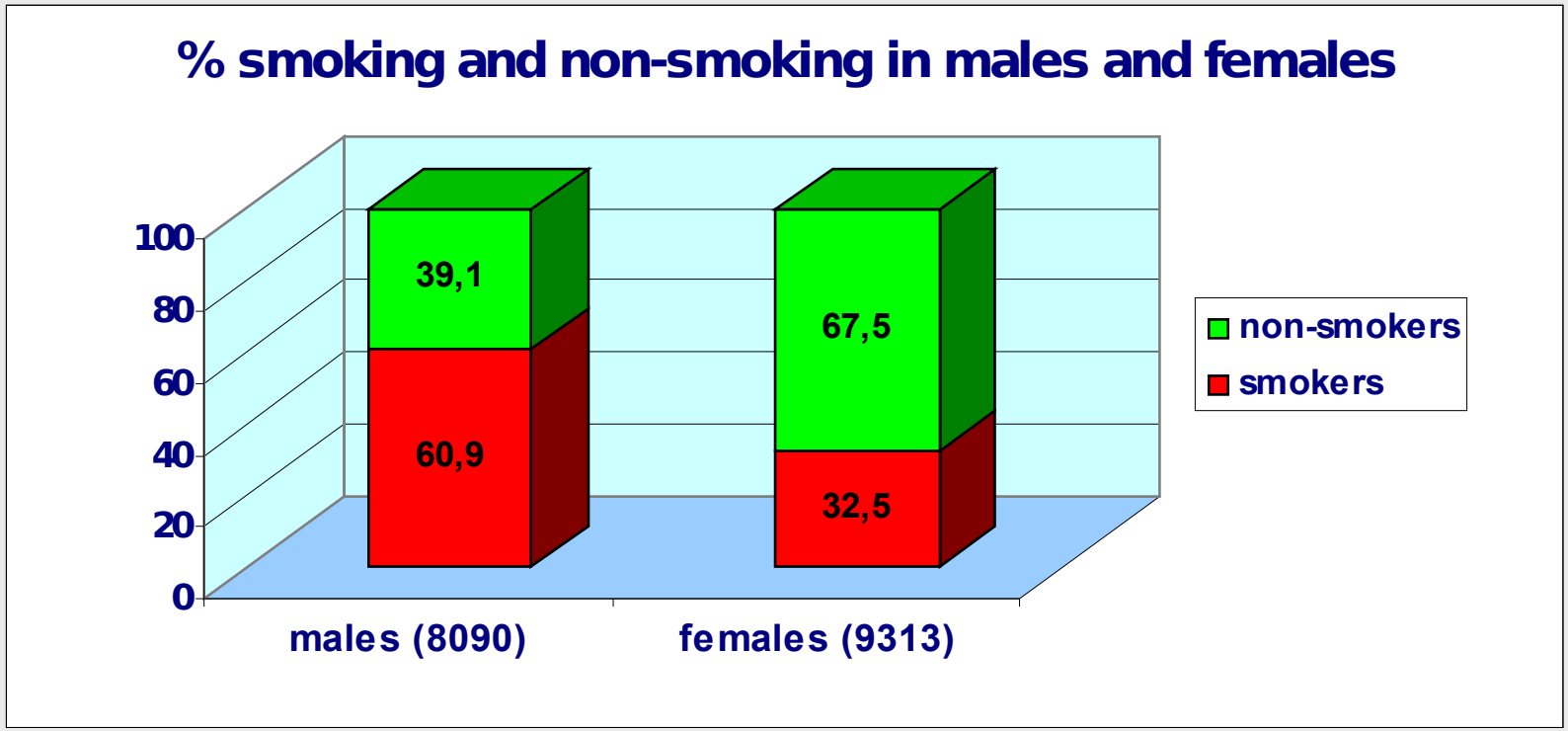
For women

<80cm: low risk

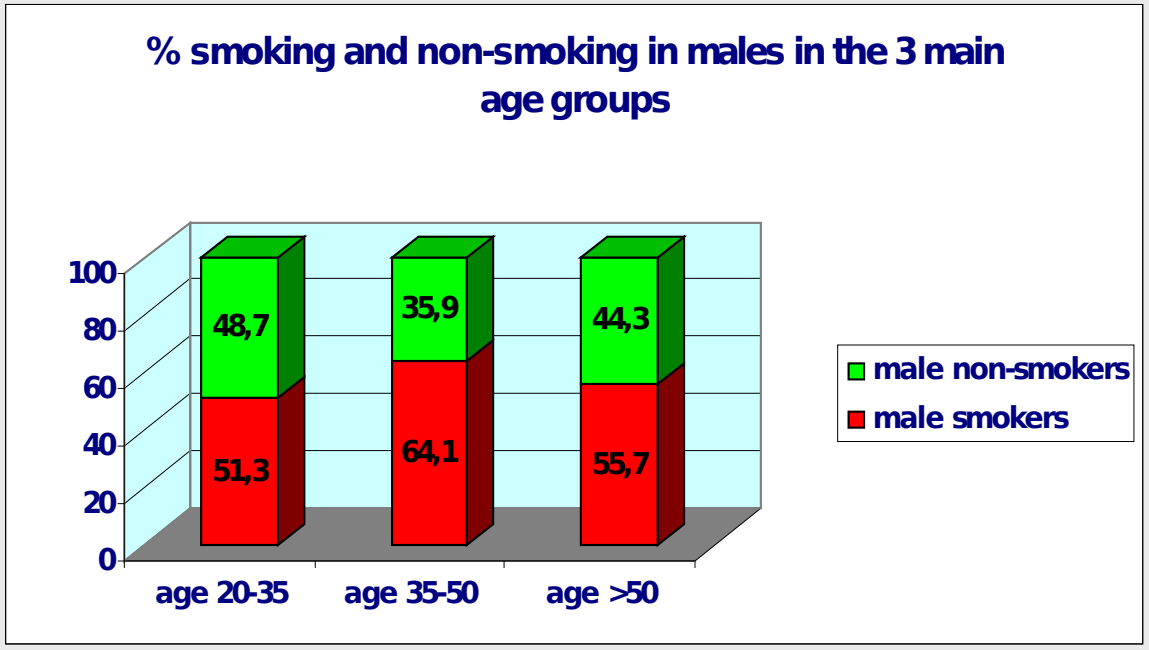
80-88cm: increased risk

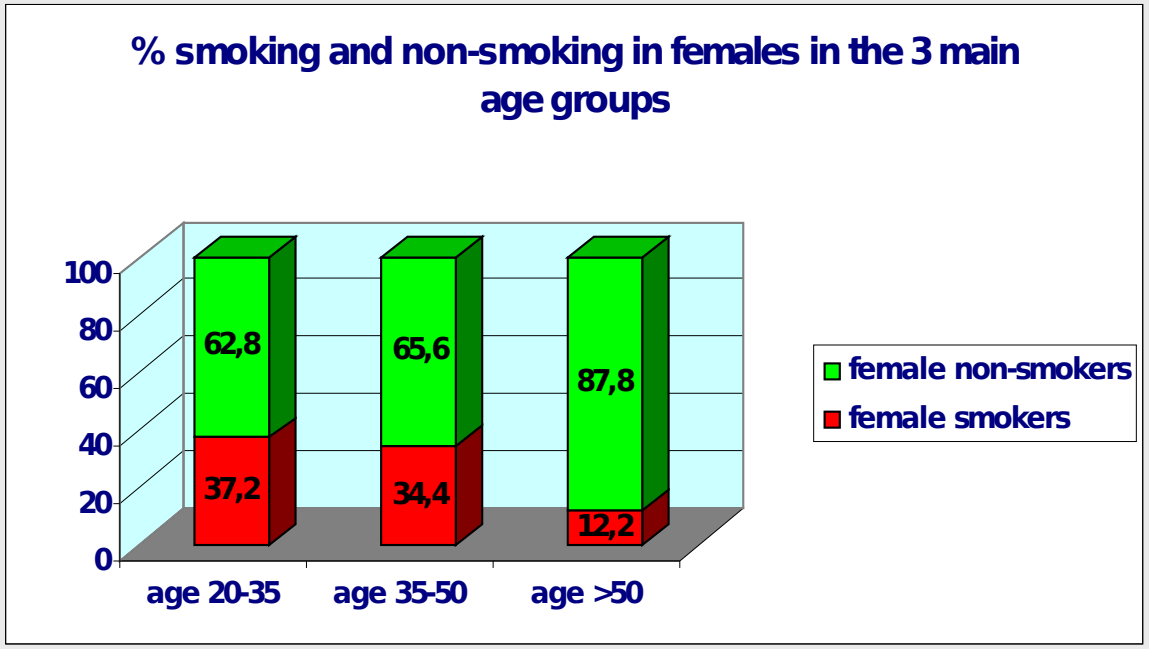
>88cm: substancially increased risk

Results



$X^2=1409.4,\ p=0.000$





Age 20-35
X^2=52.4, p=0.000

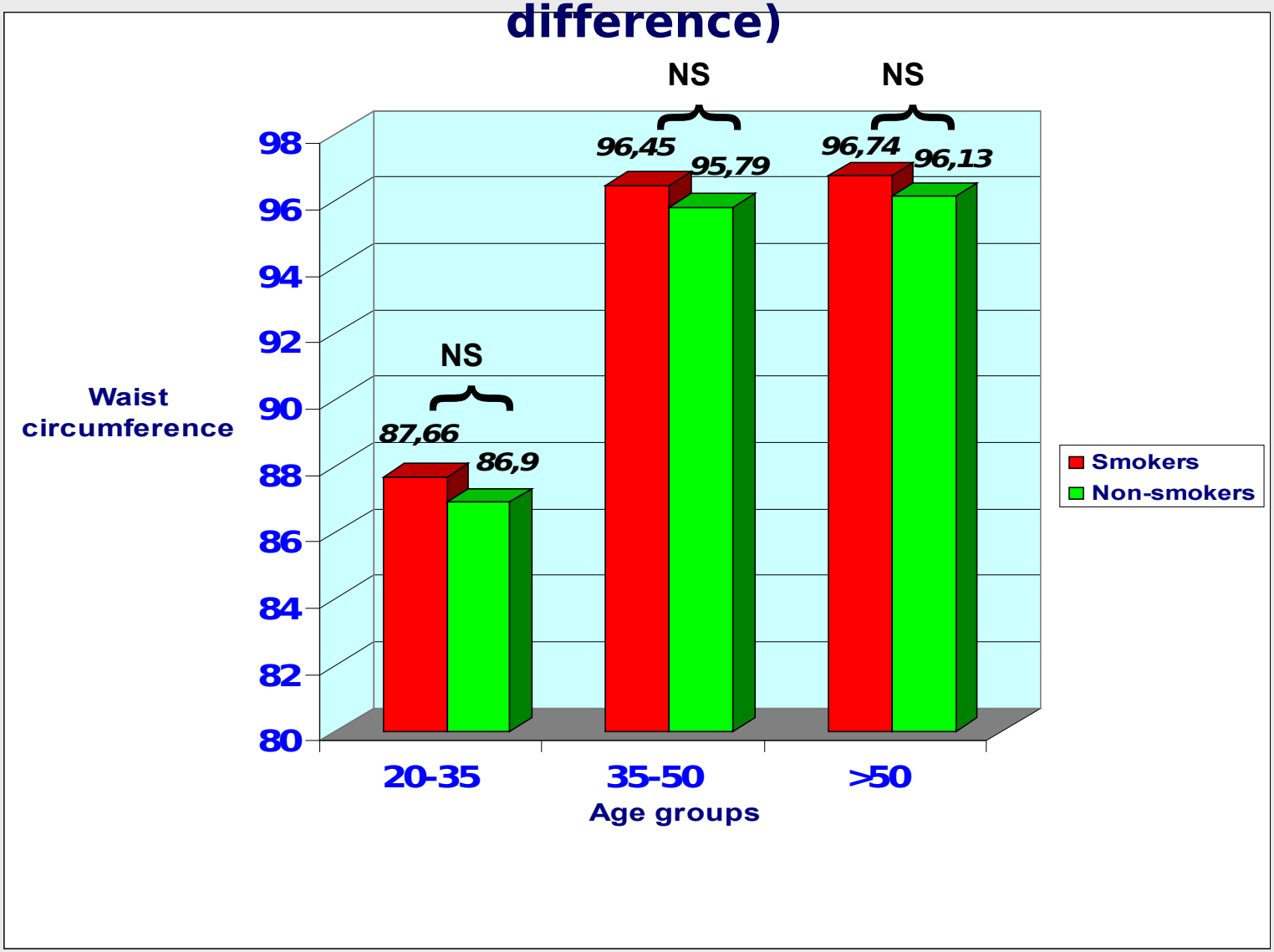
Age 35-50
X^2=1023, p=0.000

Age >50
X^2=520, p=0.000

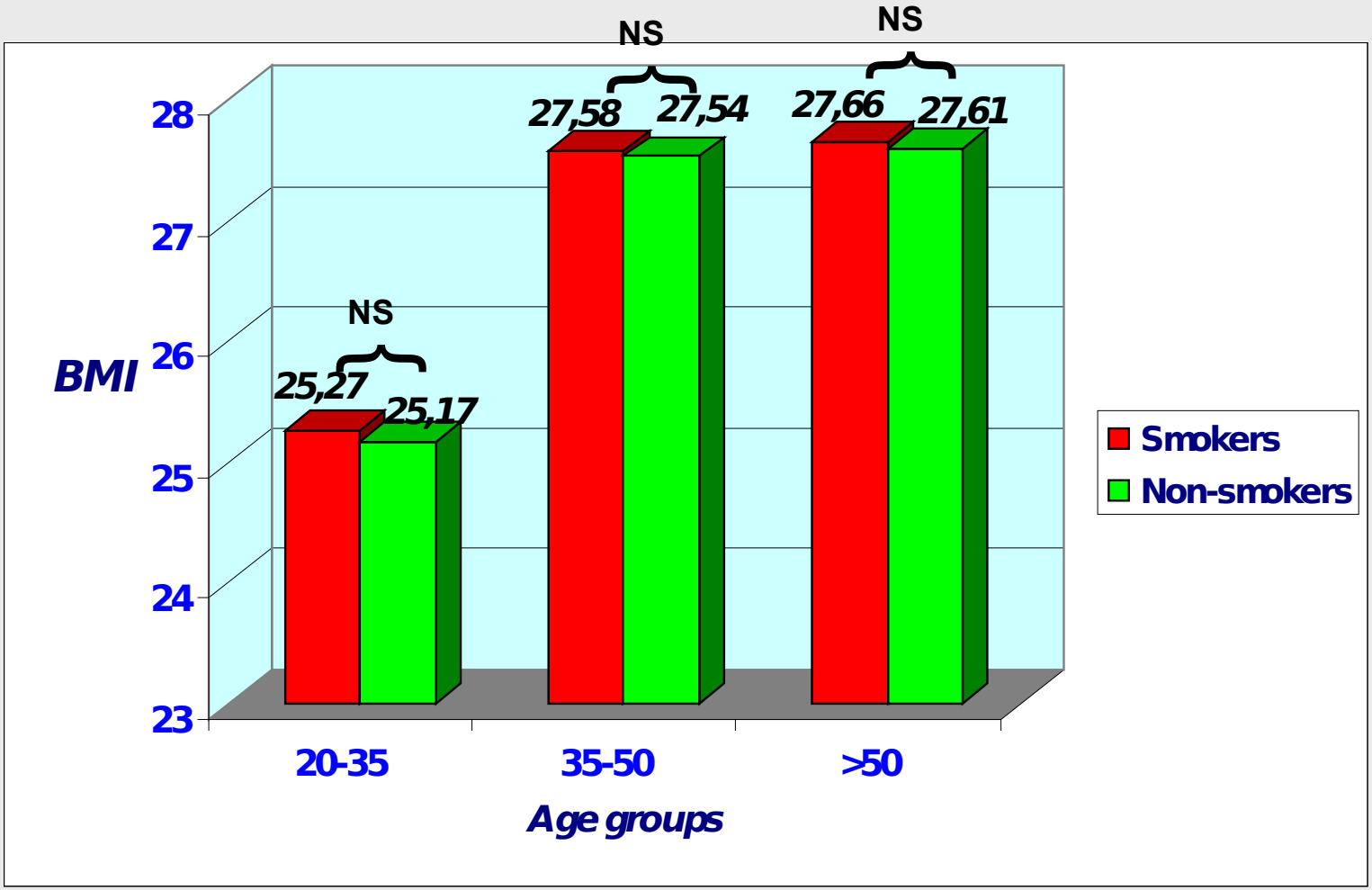
Waist circumference and BMI in male and female smokers and non-smokers (statistically significant difference)

		Smokers	Non-smokers	p
Male	Waist	95.65±15.63	94.66±15.84	0.000
	BMI	27.38±4.75	27.23±4.92	0.037
Female	Waist	84.63±13.89	85.85±14.79	0.000
	BMI	25.42±5.02	25.87±5.28	0.000

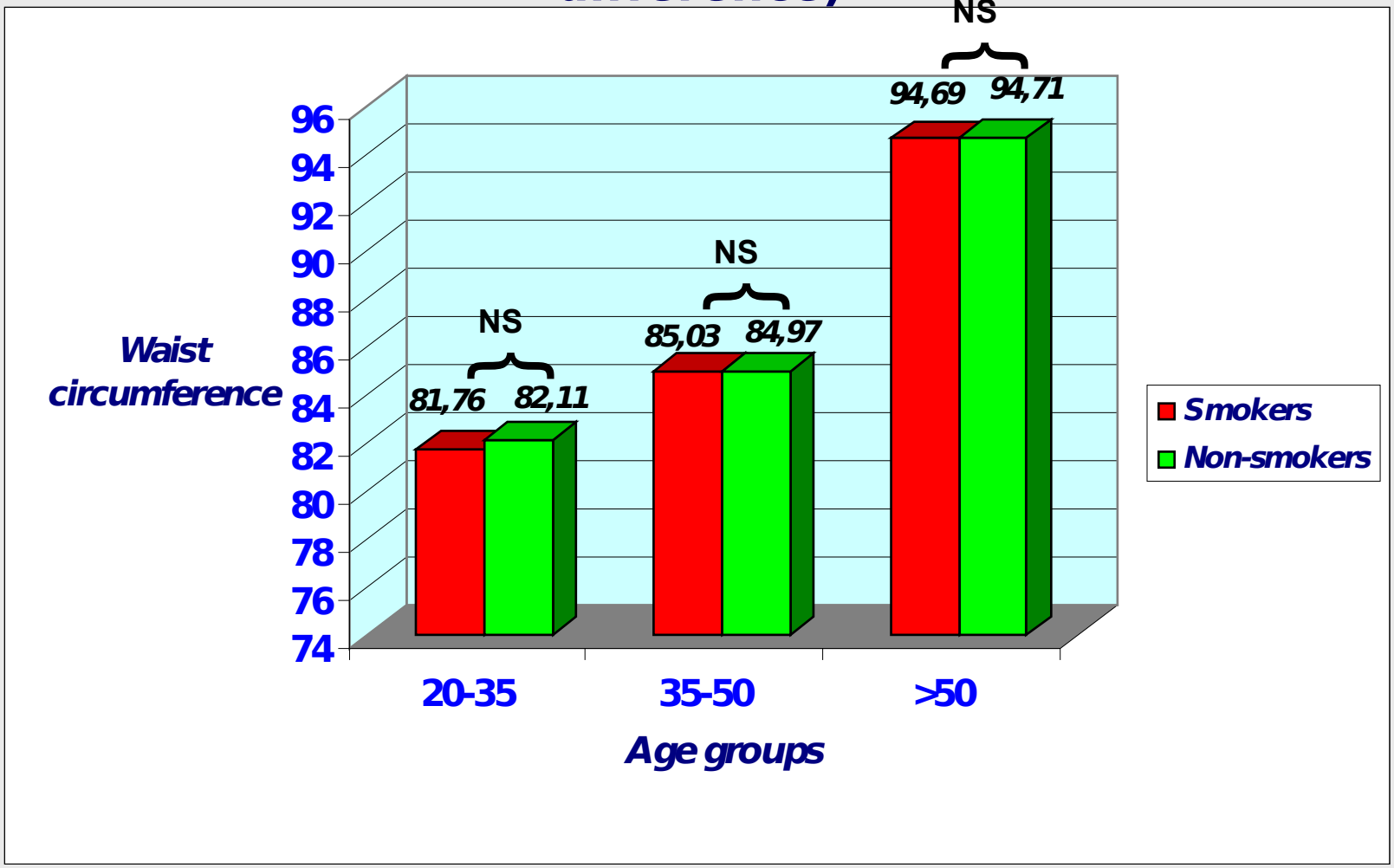
Males: Waist circumference in smokers and non-smokers in the 3 different age groups (non-significant difference)



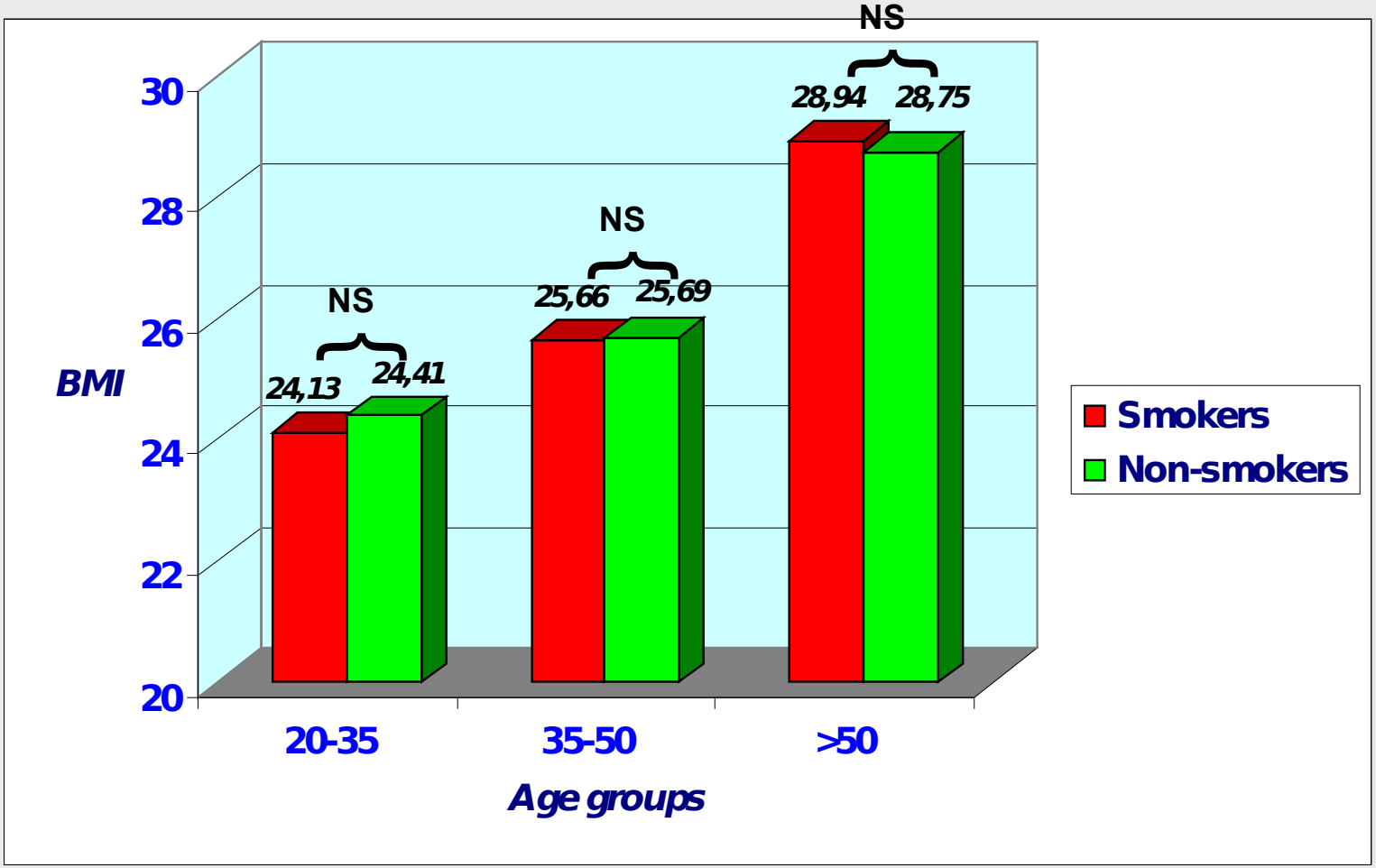
Males: BMI in smokers and non-smokers in the 3 different age groups (non-significant difference)



Females : Waist circumference in smokers and non-smokers in the 3 different age groups (non-significant difference)



Females: BMI in smokers and non-smokers in the 3 different age groups (non-significant difference)



Multiple regression analysis in males

Dependent variable= BMI

Independent variables= age, walking habits, marital status, smoking

	beta	*p*
Age	0.016	0.166
Walking habits	-0.021	0.061
Marital status	0.124	0.000
Smoking habits	0.004	0.716

(F=32.563, sig=0.000)

Multiple regression analysis in females

Dependent variable= BMI

Independent variables= age, walking habits, marital status, smoking

	beta	*p*
Age	0.255	0.000
Walking habits	0.020	0.058
Marital status	0.028	0.007
Smoking habits	0.001	0.898

(F=150.8, sig=0.000)

Multiple regression analysis in males

Dependent variable= Waist circumference

Independent variables= age, BMI, walking habits, marital status, smoking

	beta	*p*
Age	0.014	0.199
BMI	0.510	0.000
Walking habits	-0.015	0.143
Marital status	0.081	0.000
Smoking habits	0.015	0.150

(F=515.162, sig=0.000)

Multiple regression analysis in females

Dependent variable= Waist circumference

Independent variables= age, BMI, walking habits, marital status, smoking

	beta	*p*
Age	0.112	0.000
BMI	0.592	0.000
Walking habits	-0.200	0.023
Marital status	-0.003	0.750
Smoking habits	0.005	0.608

(F=1021.658, sig=0.000)

Multiple regression analysis in male smokers

Dependent variable= BMI

Independent variables= age, cigarettes/day, walking habits, marital status

	beta	*p*
Age	0.079	0.000
Cigarettes/day	0.011	0.435
Walking habits	-0.033	0.025
Marital status	0.078	0.000

(F=22.257, sig=0.000)

Multiple regression analysis in males smokers

Dependent variable= Waist circumference

Independent variables= age, BMI, cigarettes/day, walking habits, marital status

	beta	*p*
Age	0.039	0.008
BMI	0.497	0.000
Cigarettes/day	0.038	0.004
Walking habits	-0.017	0.216
Marital status	0.050	0.001

(F=294.101, sig=0.000)

Multiple regression analysis in female smokers

Dependent variable= BMI

Independent variables= age, cigarettes/day, walking habits, marital status

	beta	*p*
Age	0.201	0.000
Cigarettes/day	0.014	0.463
Walking habits	0.027	0.144
Marital status	0.018	0.339

(F=32.347, sig=0.000)

Multiple regression analysis in female smokers

Dependent variable= Waist circumference

Independent variables= age, BMI, cigarettes/day, walking habits, marital status

	beta	*p*
Age	0.073	0.000
BMI	0.614	0.000
Cigarettes/day	0.004	0.795
Walking habits	0.004	0.799
Marital status	-0.013	0.423

(F=334.007, sig=0.000)

Conclusions

- Greek ***males*** are ***greater smokers*** than females on the whole and in the three main age groups.
- Contrary to general belief, *smoking habits are not correlated to obesity indices*, with the exception of ***waist circumference in male smokers*** which seems to be ***related to the number of cigarettes smoked per day.***
- ***Age is a confounding factor*** when estimating the relationship between obesity indices and smoking habits: Males of the middle age, who happen to be greater smokers, are more obese, while younger women, who happen to be thinner, are the ones that smoke more.

Discussion (a)

- A widely held but poorly documented view is that tobacco smoking may reduce body weight and certain obesity indicators:

- Animal studies have shown that nicotine ***decreases appetite and energy intake***
- However, epidemiological studies in adults have shown that the habitual intake of smokers is equal to or greater than nonsmokers and that the diet of smokers is more energy dense than that of nonsmokers.
- Concerning energy expenditure, cigarette smoking ***increases Resting Metabolic Rate***: Nicotine increases sympathetic nervous system activity and increases thermogenesis in adipose tissue, at least in rodent studies.

Discussion (b)

- Different studies on the relationship between smoking habits and obesity come to conflicting results, mainly because of the many ***confounding factors***: alcohol consumption (that usually goes with heavy smoking), socioeconomic status, psychological profil, age, initial reason for taking up smoking, health problems that lead to restraining from smoking etc.
- However, the most ***common finding*** is that ***smokers are leaner than nonsmokers***, but ***among smokers, smoking intensity is positively related to obesity***, mainly of central distribution.
- According to our results, ***smoking habits are not in any way correlated to obesity indices with the exception of waist circumference in male smokers, which seems to be related to the number of cigarettes smoked per day.***

Thank You!!!