OBESITY, A PUBLIC HEALTH THREAT IN GREECE: ITS CONTRIBUTION TO FUTURE CARDIOVASCULAR DISEASE BURDEN

Giota Touloumi[1], Natasa Kalpourtzi[1], Argyro Karakosta[1], Konstantinos Makrilakis[2,3]

1: Department of Hygiene, Epidemiology & Medical Statistics, Medical School, National & Kapodistrian University of Athens, Athens, Greece

2: Hellenic Diabetes Association, Athens, Greece

3: First Department of Propaedeutic Internal Medicine, Medical School, National and Kapodistrian University of Athens, Athens, Greece

Background

- Obesity is a modern-world pandemic, associated with other metabolic cardiovascular risk factors (CVRF) such as hypertension, dyslipidemia and diabetes/pre-diabetes. In Greece, previous obesity data were based on self-reported measures or were restricted to specific areas.
- In this study **we aimed** to estimate the prevalence of obesity in a random sample of adults (≥18 years) living in Greece; assess its association with demographic/socio-economic/lifestyle factors and its clustering with other CVRF. We also aimed to assess the long-term impact of obesity on CVD burden.

Methods

- Data were derived from the Nationwide Survey EMENO (2013-2016). The sample was selected by the multistage stratified random sampling method.
- Participants were assessed at home visits; blood tests, physical examination, anthropometric and blood pressure measurements were performed by trained physicians.
- All results are adjusted for population age/sex distribution, study design and non-response probability through weighting.
- A simulation study reproducing EMENO structure was conducted to estimate CVD events over a 10-year period under a scenario without (status-quo) and with an intervention that would have achieved a mean of 6kg/4kg weight reduction among obese/overweight individuals (BMI scenario).

Results

- 6,006 participants were interviewed; 4765 were included in the analysis (51.5% women, mean age 49.2 years).
- The **estimated prevalence** of underweight, normal-weight, overweight and obese was 1.1%, 29.1%, 37.7% and 32.1% respectively.

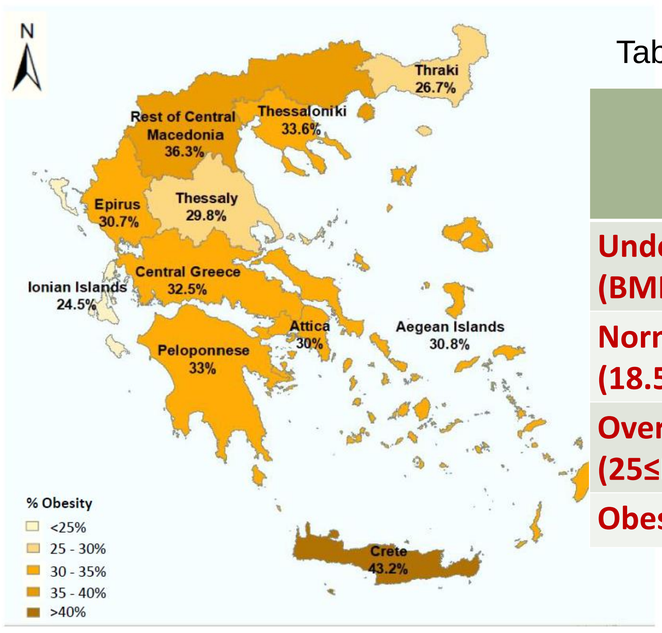

Figure 1. Prevalence of obesity in Greece

Table 1. Estimated Prevalence

	Estimated prevalence* (95% CI)
Underweight (BMI<18.5)	1.1 (0.8, 1.6)
Normal Weight (18.5≤BMI<25)	29.1 (27.6, 30.7)
Overweight (25≤BMI<30)	37.6 (35.9, 39.2)
Obese (BMI≥30)	32.2 (30.6, 33.8)

*:Weighted estimate

- Obesity prevalence differed by region, being highest in Crete and lowest in the Ionian islands and Thrace (Figure 1).
- Higher educational level, higher income, better adherence to Mediterranean diet (MD), and increased physical activity were independently associated with lower odds of being obese (Figure 2).
- Prevalence was lower in women up to age 40 and higher at older ages.

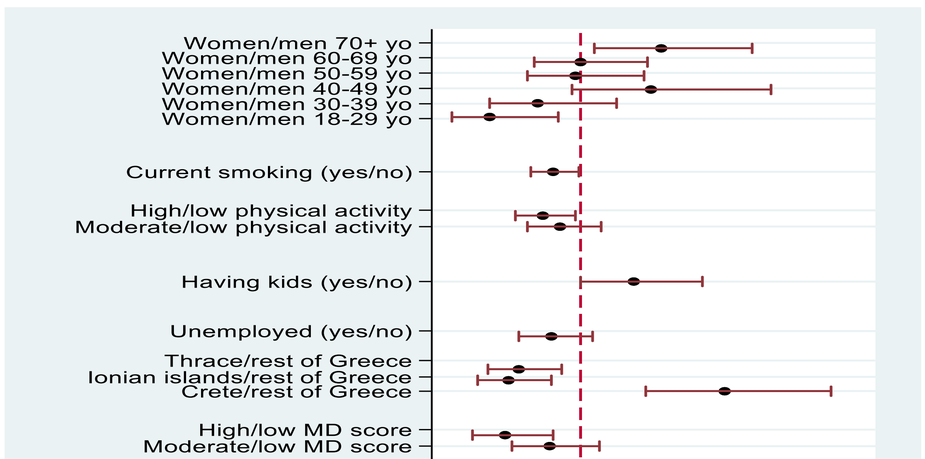

Figure 2. Factors associated with being obese.

- Obesity co-existed with other CVRF (hypertension, dyslipidemia, diabetes, and pre-diabetes); among obese participants, only 18.5% had no other CVRF (Figure 3)
- The difference in proportion of having at least one disease between obese and non-obese was larger at younger ages (Figure 4). Proportionally to its prevalence the biggest difference between obese and non-obese was in diabetes/prediabetes prevalence (obese: 20.4%/19.6%; non-obese:7.5%/8.9%)

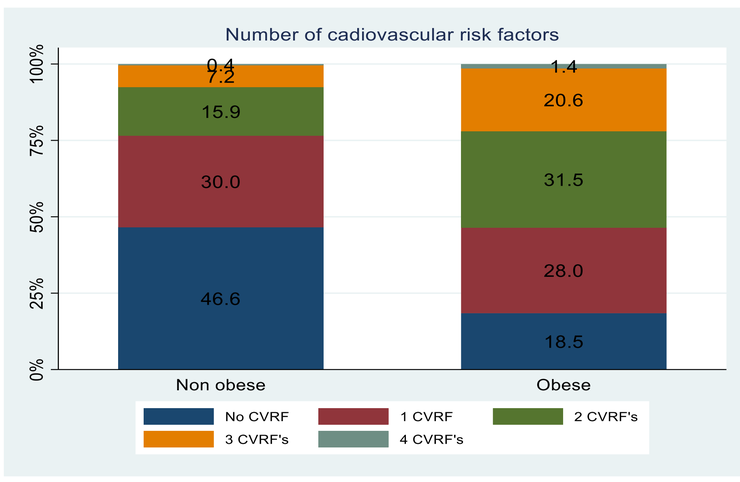

Figure 3. Number of cardiovascular risk factors (CVRF) existed in obese and non-obese participants.

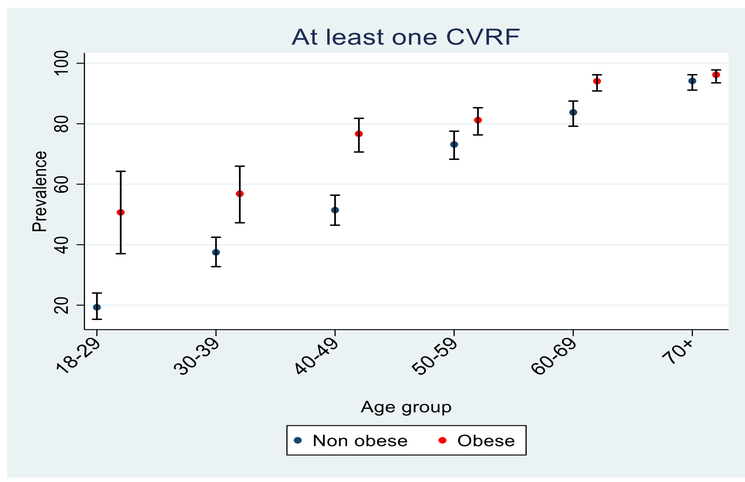

Figure 4. Percent of having at least one disease in obese and non-obese participants by age group

It is estimated that, compared to status-quo, **23,469 CVD cases could be averted over a 10 years period** under the BMI-scenario (Table 2)

Table 2. 10-year estimated cumulative median CVD cases (95% credible interval- CrI) under status-quo and under the BMI scenario

	Median (95% CrI)
Status-quo	1,638,695 (1,616,748-1,660,700)
BMI scenario	1,662,164 (1,640,747-1,685,353)

Conclusions

- Obesity is alarmingly high in Greek adults; Socioeconomic factors are among its most important associates.
- Obesity co-exists with other metabolic diseases, particularly among young adults. It should be recognized as a public health threat.
- Focused interventions aiming to reduce BMI should be urgently taken as, even a low-scale feasible intervention could lead to thousands of averted CVD cases.

Funding

This study was supported by Novo Nordisk. EMENO was co-funded by the EU Social Fund and National resources