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Tax as Public Health Policy:
A Questionnaire Analysis for Soft Drinks

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Abstract

According to Eurostat, the weight problems and obesity are increasing at a serious rate as more than half of the EU population is overweight or obese. **Greece** is one of the countries with the highest percentage of overweight and obese people as it is fifth in both men and women among the Member States of the European Union and second in Greek adolescents after USA.

One way to combat obesity is the taxation of soft drinks because, as research has shown, soft drinks are directly related to the increase in body weight which in its turn causes other diseases. Statistics show that after 2009, soft drinks' consumption decreases but this reduction is justified as, because of the financial crises, there was a reduction in incomes. But, soft drinks' taxation is still a good idea because with the increase in soft drinks' prices through taxation, soft drinks' consumption is expected to be reduced more. (because they do not have nutrients and contain many calories.)

The most appropriate tax for this purpose is seems to be the excise tax as it less affected by companies' strategies in discounts thus it can raise more stable revenues and it is easier in revenue collection because of the small number of soft drinks' companies. The revenue from the tax should be invested in such a way as to help reduce obesity and not for unrelated purposes. For instance, government could fund health-promoting programs, such as media campaigns in order to inform the public about the hazards of unhealthy goods and to promote a healthier lifestyle or help people with low or middle-income to receive better qualitative foods.

To find out if such a tax could be effective, we examined the behavior of the Greek population through a questionnaire analysis. More specifically, we asked them questions about soft drinks, obesity and the case of a tax on soft drinks. The majority of respondents believe that frequent consumption of soft drinks increases the probability of someone to become overweight or obese and that it may cause addiction to them. Moreover there is a nearly unanimous agreement that obesity is a serious problem generally in Greece and in Greek youths too and that government is not doing enough to fight obesity.

About the tax on soft drinks, most of respondents believe that a tax of 10, 5 or 2 cents per 330 ml will not change their soft drinks consumption but they support a tax on soft drinks and mostly the largest one. For those who are against the tax, the main reason is that they believe that it is not an effective measure and that government would not invest the tax's revenue with the most appropriate way.

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Introduction

Nowadays, a serious problem which is on a rise is obesity. Statistics show that many of the European Union's States are facing this problem and Greece is one of them as it is fifth in European Union in overweight and obese people. Findings are equally disappointing for the Greek adolescents with 1 in 5 (21.9%) being overweight or obese, percentage which is second in the rank after USA. Those statistics, which are given in more details in chapter 1, show that some action should be taken and perhaps one of them is a tax on "sin goods". This thesis is limited only on the soft drinks because they are the only individual beverages that have been directly linked to obesity, and soft drink taxes would be easier to be collected because of the modest number of manufacturers. Moreover, soft drinks are goods without nutrients and thus they are not necessary for someone to survive. So, such tax would not harm individuals, like a tax on junk foods which are cheap and some people consume them because they are affordable.

The purpose of this thesis is to examine if a tax on soft drinks could work and our findings are based on public opinion. To achieve that, we start in chapter 1 with some statistics on obesity in Greece and Europe and on soft drinks consumption in Greece. In chapter 2, we give some reasons why we should tax soft drinks and then analyze which tax is the most appropriate in order to reduce soft drinks' consumption and raise revenue. We analyze how this tax is expected to operate and how government could use the revenue to increase consumers' welfare. But, as most of the interventions, soft drinks' taxation has some opponents. For this reason, in the last part of chapter 2 we analyze the objections and provide some arguments in favor of the tax.

In the last chapter, chapter 3, which constitutes the main contribution of this thesis, we discuss the results from a questionnaire analyzing people's opinion on soft drinks taxation. More specifically, people were asked about their soft drinks' consumption, their opinion on obesity in Greece and its connection with soft drinks consumption. Moreover, they were asked if they believe this tax would have an effect on soft drinks' consumption and if they would be in favor of such a tax.

The main results from this questionnaire are that the majority of respondents believe that obesity is a serious problem in Greece and that frequent consumption of soft drinks increases the probability of someone to become overweight or obese.

About the tax on soft drinks, most of respondents believe that a tax of 10, 5 or 2 cents per 330 ml will not change their soft drinks consumption but they support a tax on soft drinks and mostly the largest one. For those who are against the tax, the main reason is that they believe that it is not an effective measure and that government would not invest the tax's revenue with the most appropriate way.

Chapter 1

Obesity and Soft Drinks' Consumption

In this chapter we are going to examine an important problem which is on a rise, obesity. As it is known, obesity is a problem which concerns a lot of people. Thus, it would be very interesting to look at statistics about obesity initially for Europe and Greece in general and then for Greek adolescents. Then, we are going to look at statistics on consumption of soft drinks which belong to the category of “sin” goods that cause obesity.

1. Obesity in Europe and Greece

In November of 2011, the statistical office of the European Union (Eurostat) published data about overweight and obesity in the European Union which come from the European Health Interview Survey (EHIS). The EHIS aims at measuring the health status, life style and health care of citizens across the EU Member States on a harmonized basis (European Health Interview Survey, 2011).

The main result from that study is that weight problems and obesity are increasing at a serious rate. Over the last decade the proportion of the population that is overweight has increased considerably in most Member States as more than half of the EU population is overweight or obese. More specifically, the total rates of obesity and overweight in Europe vary, ranging between 39.6% -56.7% for women and 51% - 69.3% for men (European Health Interview Survey, 2011; Mednutrition, 2012)

Generally, among the 19 Member States for which data are available, the proportion of obese people in the adult population varied in 2008/9 between 8.0% and 23.9% for women and between 7.6% and 24.7% for men. Respectively, the figures for the USA were 26.8% for women and 27.6% for men in 2009 (European Health Interview Survey, 2011).

More specifically, the highest proportions of obese women were recorded in the **United Kingdom** (23.9%), **Malta** (21.1%), **Latvia** (20.9%) and **Estonia** (20.5% in 2006/7), and of men in **Malta** (24.7%), the **United Kingdom** (22.1%), **Hungary** (21.4%) and the **Czech Republic** (18.4%). On the contrary, the lowest shares of obesity in 2008/9 for both women and men aged 18 years and over were observed in **Romania** (8.0% for women and 7.6% for men), **Italy** (9.3% and 11.3%), **Bulgaria** (11.3% and 11.6%) and **France** (12.7% and 11.7%) (European Health Interview Survey, 2011).

Greece is fifth in both men and women among the Member States of the European Union with rates of overweight and obesity 30.7% and 17.6% respectively for women, and 46.6% and 17.6% respectively for men (Figures 1.1 and 1.2) (Mednutrition, 2012).

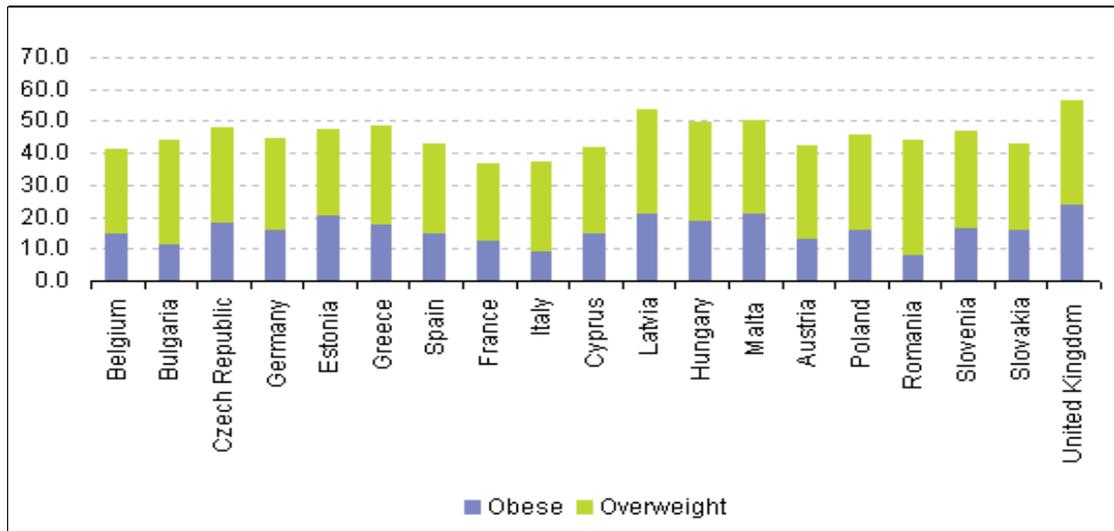


Figure 1.1: Overweight and obese women, 2008 (%) – source: Eurostat ([hlth_ehis_de1](#))

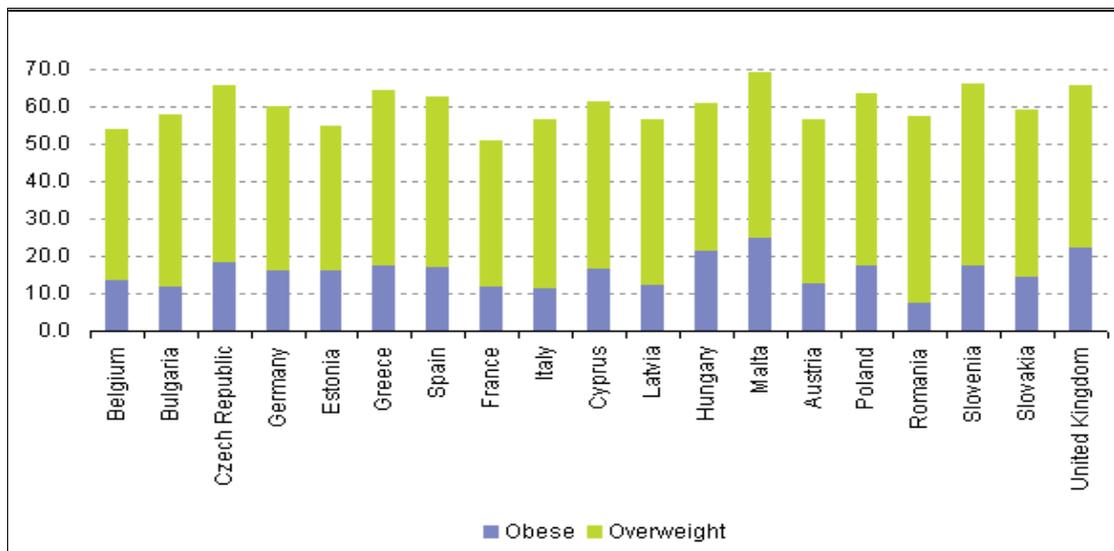


Figure 1.2: Overweight and obese men, 2008 (%) – source: Eurostat ([hlth_ehis_de1](#))

Regarding the difference in obesity between women and men, it seems that it is not systematic as the proportion of obesity was higher for women in eight Member States, higher for men in ten and equal in one. But, although there is no difference in obesity by gender, we can not say the same if we examine the obesity rates by age and educational level (European Health Interview Survey, 2011).

Starting with the obesity rates by age groups, it seems that there is a positive relationship between obesity and age. That means that the older the age group, the higher the share of obese persons. This pattern is very clear of all women in the Member States. The largest differences between the youngest and oldest age groups of women were observed in **Latvia**, **Slovakia**, the **Czech Republic** and **Estonia** (Figure 1.3). For men, in twelve of the nineteen Member States for which data were available, the highest share of obesity was recorded for the age group 65-74, while in

the remaining seven Member States, the highest share was registered for the age group 45-64. The largest differences between age groups for men were found in the **United Kingdom, Hungary, Malta** and **Greece** (Figure 1.4) (European Health Interview Survey, 2011).

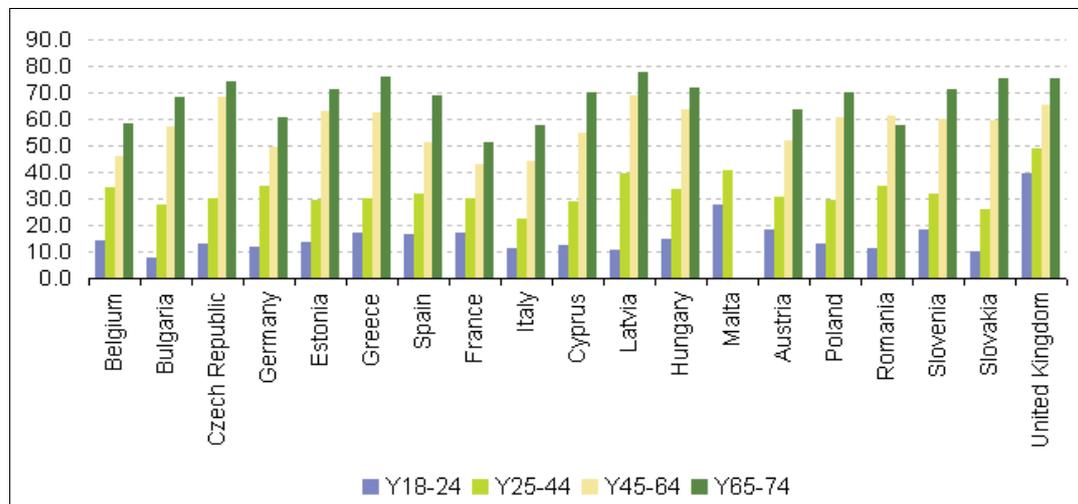


Figure 1.3: Overweight and obese women - by age (%) - source: Eurostat (hlth_ehis_de1)

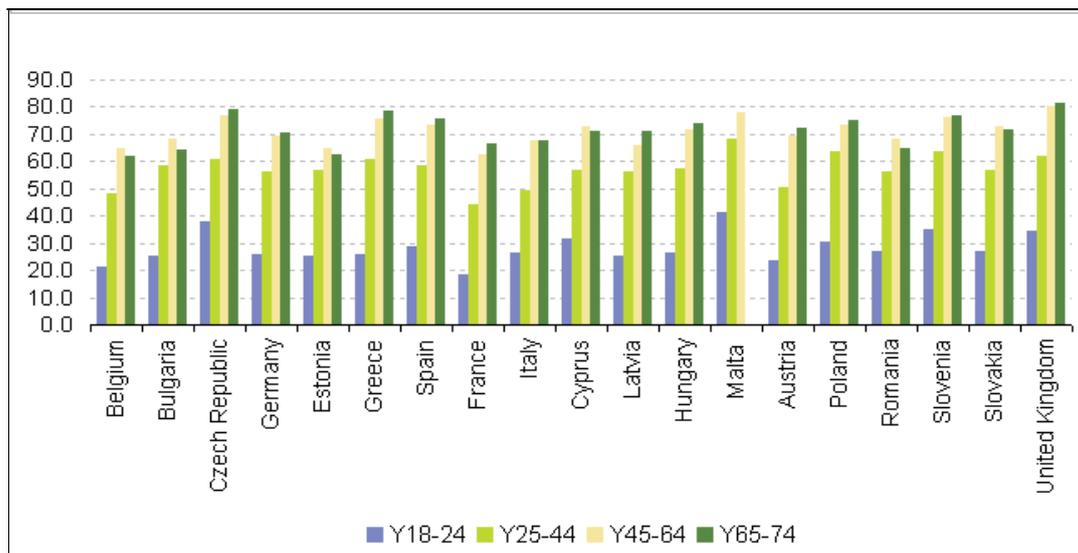


Figure 1.4: Overweight and obese men - by age (%) - source: Eurostat ([hlth_ehis_de1](#))

As regards the obesity rates by educational level, it seems that there is a negative relationship between obesity and educational level. That means that the proportion of persons who are obese falls as the educational level rises. This pattern is clear again for all women in the Member States. The largest differences in obesity between women with a low educational level and those with a high educational level were observed in **Slovakia, Malta, Poland** and **Greece** (Figure 1.5).

On the contrary, this pattern is not so clear for men but it is still the dominant one as in eleven of the available Member States, the highest share of obesity was observed for those with a low educational level, in five Member States for those with a medium educational level while in **Bulgaria** and **Estonia** it was for those with a high educational level (Figure 1.6) (European Health Interview Survey, 2011)

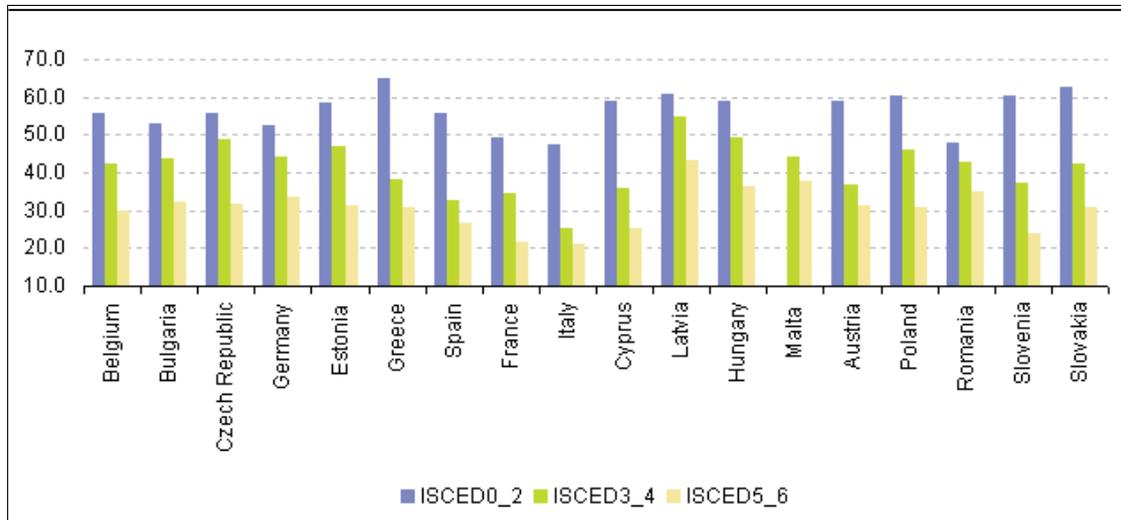


Figure 1.5: Overweight and obese women - by educational level (%) - source: Eurostat (hlth_ehis_de1)

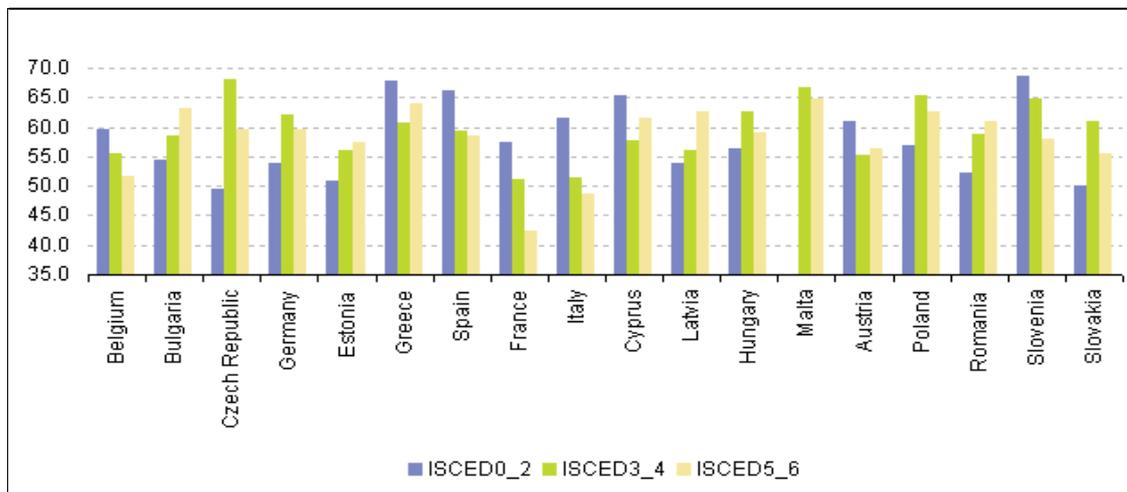


Figure 1.6: Overweight and obese men - by educational level (%) - source: Eurostat (hlth_ehis_de1)

2. Obesity in Greek Adolescents

Obesity in children is an extremely important issue as it creates many health and psychological problems from early age. In Greece now, when children go to primary school, they take a blood test as many of them have health problems like elevated cholesterol levels and type 2 diabetes.

Some results about obesity in Greek children are presented in a recent research in adolescents with age 11, 13 and 15 years old within the framework of the international project «Health Behaviour in School-Aged Children »(HBSC, www.hbsc.org) under the auspices of the World Health Organization (this program is accomplished in Greece by UMHRI¹). The results from HBSC show that the rates of obese / overweight children in European countries and North America range from 30% (USA) to 6% (Switzerland, Netherlands). Greece is one of the three countries with the highest rates of obese adolescents for all the three age groups and more specifically is second in the rank after USA (Η παχυσαρκία στους εφήβους, 2012).

In Figure 1.7, we can observe the result about overweight / obese and obese adolescents by sex, age and year after calculating the BMI(Body Mass Index). As we can see, 1 in 5 adolescents (21.9%) in Greece is overweight or obese. More specifically, the percentage of overweight / obese boys is 27.8% and it is significantly higher than that of girls (16.3%). As regards the obese children, the pattern is the same as the percentage of obese boys is 4.2% and it is higher than that of girls (2.2%). About the overweight / obese adolescents by age, there are no significant differences between the three age groups (Η παχυσαρκία στους εφήβους, 2012).

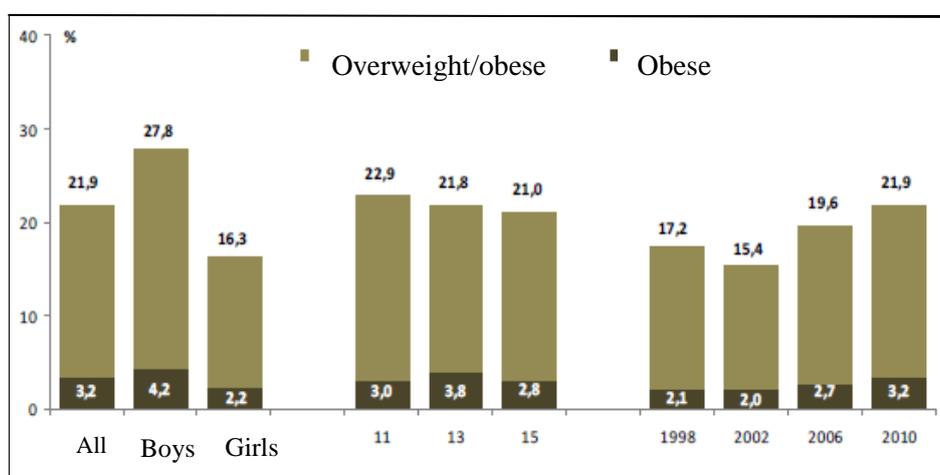


Figure 1.7: Overweight / obese and obese adolescents by sex, age and year (%) – source: epipsi (http://www.epipsi.gr/pdf/2011/10_HBSC_2010_EIPSI_2012.pdf)

Over time, between 2002 and 2010, we observe an increase in the proportion of both overweight and obese adolescents. More particularly, the percentage of overweight / obese students from 15.4% in 2002 rises to 21.9% in 2010 and the percentage of obese students from 2% rises to 3.2% in the same period. These results can also be observed in Figure 1.8 (Η παχυσαρκία στους εφήβους, 2012)

¹ UMHRI: University Mental Health Research Institute

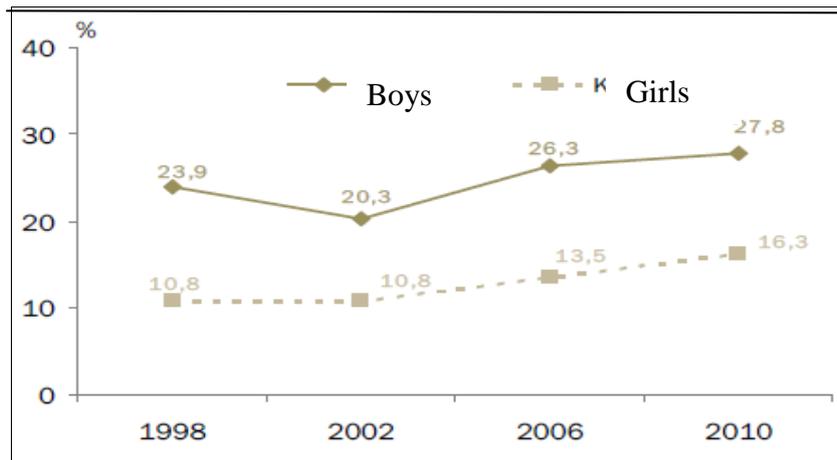


Figure 1.8: Overweight or obese adolescents over time, by sex (%) – source: epipsi (http://www.epipsi.gr/pdf/2011/10_HBSC_2010_EIPSI_2012.pdf)

Regarding the opinion that students have about their health, it seems that there is a big difference between overweight / obese and normal-weight students as the 11.7% of overweight or obese children believe that they have moderate / poor health and only 4.7% of normal-weight children believe the same (Figure 1.9) (Η παχυσαρκία στους εφήβους, 2012).

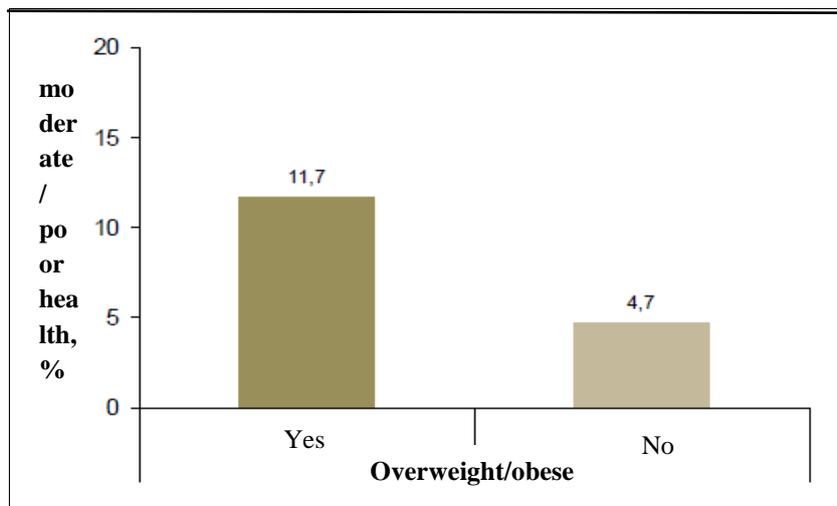


Figure 1.9: Self-report about moderate / poor health compared with whether or not adolescents are overweight / obese – source: epipsi (http://www.epipsi.gr/pdf/2011/10_HBSC_2010_EIPSI_2012.pdf)

Thus, because statistics have shown that Greece has a very important problem of obesity as it is fifth in Europe for adults and second worldwide for adolescents, there arises the need to take action to combat obesity. One way this to be achieved is the taxation of unhealthy goods such as soft drinks. For this reason, we are looking at soft drinks' consumption in Greece.

3. Soft Drinks' Consumption in Greece

According to the Union of European Soft Drink Associations (UNESDA), there is a reduction in soft drinks' consumption in Greece. More specifically, there is a small increase in 2008 (1.25%) and after that soft drinks' consumption falls down rapidly. In 2008 people in Greece consumed 762.9 million litres and in 2012 570.7 million litres. Thus, the difference in 2012 from 2008 is 192.2 million litres or a reduction of 25.2% (Figure 1.10). Respectively, on an individual base, someone who consumed 71.3 litres in 2008, in 2012 he/she consumed 53.3 litres. (Figure 1.11)

This reduction is not random as after 2009 incomes in Greece fell due to the financial crisis. It is therefore reasonable for soft drinks to become less affordable and in combination with the fact that they are not necessary goods this lead in a reduction in their consumption.

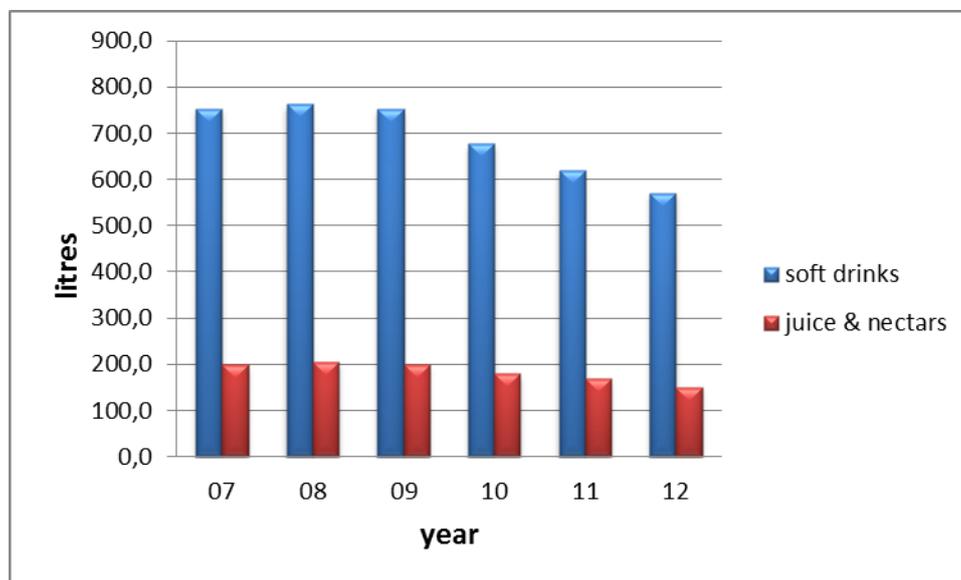


Figure1.10: Soft drinks and juice and nectars' consumption in Greece– source: UNESDA

Moreover, it would be very interesting to compare the soft drinks' consumption with that of juice and nectars. As we can see in Figure 1.10, there is a vital difference as, on average, soft drinks consumption is 506 million litres per year more than juice and nectars' consumption. The highest difference is in 2008 with 559.4 million litres and the lowest in 2012 with 420.9 million litres. This comes from the fact that the reduction in juice and nectar consumption is much smoother than soft drink consumption. That means that with the reduction in income, consumption of juice and nectars is not affected as much as the consumption of soft drinks.

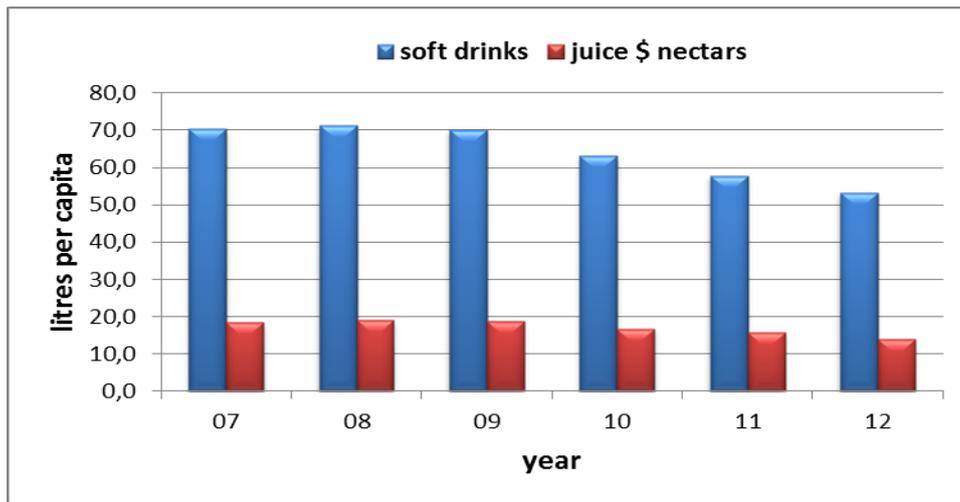


Figure 1.11: Soft drinks and juice and nectar consumption per capita in Greece— source: UNESDA

As regards the soft drinks differentiation into regular and low-calorie, it seems that the majority of people consume regular soft drinks (83%-88%) while only 12%-17% of people consume low-calorie ones. The positive here is that in 2007 the consumption of low-calorie soft drinks was 12% and every year after that increased by 1% reaching in 2012 the 17%. But still the gap between regular and low-calorie soft drinks remains huge (Figure 1.12).

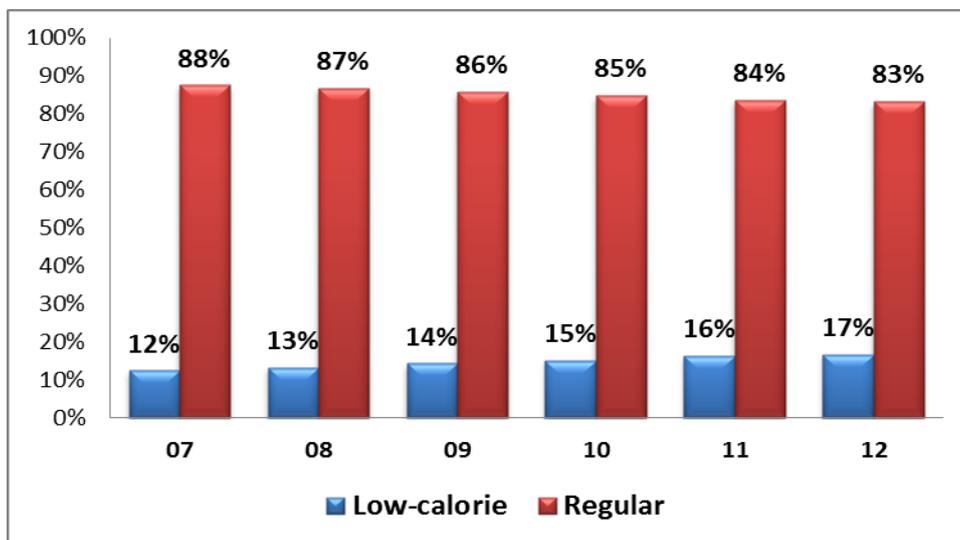


Figure 1.12: Soft drinks' differentiation into regular and low-calorie

Thus, the great majority of people consume the regular soft drinks and they prefer to drink soft drinks than juice and nectars. As we saw before, this inclination towards soft drinks was mitigated by income reduction. However, it could be mitigated further more by an increase in prices through taxation helping people adopt healthier habits.

Chapter 2

Taxing soft drinks

As we saw in chapter 1, obesity is a serious problem and it should be combated. One way this to be achieved is by taxing soft drinks since they do not have nutrients and contain many calories. Although in previous chapter we saw that soft drinks consumption has been decreasing since 2009, this is probably due to income effect, and might be temporary, and not due to a change in behaviour towards a healthier life style. An increase in soft drinks' prices through taxation would reduce consumption even further and might have a permanent effect if high prices are sustained.

1. Why tax soft drinks?

Soft drink taxation is one of the “sin taxes”, like cigarette and alcohol taxation, the purpose of which is to improve health raising revenue at the same time. But, there is a difference between tobacco and alcohol taxation and soft drink taxation. This difference is that the first one has traditionally been used for revenue raising purposes, with the health objective being a more recent one. On the other hand, soft drink taxation is discussed purely on health grounds, with its revenue suggested to fund measures that will help towards this direction. More specifically, the imposition of this tax is expected to increase the price of soft drinks by the amount of tax (although that depends on industry's behaviour). Consumers, observing the increase in prices, will reduce consumption and may substitute soft drinks with other healthier goods like skim milk or 100% natural juice. Of course, in order for the right substitution to happen, consumers should have the information to guide them in their choices. In that part, it will help to use revenue to fund information campaigns about the danger of such products and the adoption of a healthier lifestyle.

The main health problem that a soft-drinks tax wants to combat is obesity. Many studies have shown that soft drinks' consumption is directly related to weight gain. One primary reason is that relatively small increases in consumed calories can accumulate over time and may generate large changes in population weight (Fletcher and Frisvold et al., 2010, pp. 23--35). Thus, someone who tends to drink soft drinks which contain large amounts of sugar and/or calories, has a high probability to become overweight or obese. The medical literature suggests that changes in soft drink consumption as small as one serving per day can lead to significant weight change over time if not offset by caloric expenditures (Fletcher and Frisvold et al., 2010, pp. 23--35). But, the effects of soft drinks do not stop here as obesity in its turn causes a lot of problems both at individual and social level, discussed below.

1.1 Individual problems caused by obesity

Obese persons have to deal with a lot of problems. The main problem is that obesity is not just the gain weight but the source of many other health problems. Moreover, obese people have to deal with the racism and a place where this phenomenon occurs vigorously is the workplace. Those two problems are presented below in more details.

1.1.1 Health problems

According to The Academy of Medical Royal College, obesity causes a high risk for a lot of health problems. Some of those problems are type 2 diabetes mellitus, heart disease, stroke, vascular diseases, cancer and other costly and debilitating chronic diseases (Taxing Sugared Beverages Would Help Trim State Budget Deficits, Consumers' Bulging Waistlines, and Health Care Costs, 2010; Pettinger, 2013). These diseases are fatal and for the most part are due to negligence of individuals. If people cared about themselves, by following a healthy lifestyle, the incidence of these diseases could have been reduced. Moreover, frequent consumption of soft drinks is also associated with osteoporosis, tooth decay, and dental erosion (Cspinet.org, n.d.). At individual level, obesity is associated with health care expenditures that are on average about one-third above medical costs of otherwise similar normal weight people (Yale Rudd Center, n.d.). But, the full effects of obesity trends since the 1980s are not yet fully apparent because health problems caused by weight gain take time to appear (Yale Rudd Center, n.d.).

1.1.2 Problems at work

Additionally, except for health costs, obese people have also to face many indirect costs. One of them is the weight discrimination in the workplace which is the most prevalent place for that. Overweight people may face biased hiring decisions even before they reach a job interview. Research shows that when a resume is accompanied by a picture or video, the overweight applicant is judged more negatively and is less likely to be hired. Promotion and firing are also influenced by weight discrimination. Research shows that employers see their overweight workers as poor role models; they describe overweight employees as lazy, sloppy, lacking in self-discipline, less competent and less conscientious (Yale Rudd Center, n.d.). Moreover, employers do not choose obese people because of the significant financial burden. Obese workers miss more days of work and cost employers more in medical and disability claims as well as workers compensation claims. (Yale Rudd Center, n.d.). But, this approach might lead overweight people in an even greater reduction in their productivity as their self-esteem is reduced and this might cause psychological problems.

For these reasons, the link between income and most health indicators is negative, implying that people with low income have on average worse health status. More specifically, as regards obesity, researchers have found that both obese men and obese women earn lower wages for the same jobs than their normal-weight counterparts, and in some studies, women were shown to experience almost two times the wage penalty compared to men (the income-obesity relationship for men is less clear) (Yale Rudd Center, n.d.).

1.2 Social problems caused by obesity

1.2.1 *The externality*

People who advocate a tax on soft drinks compare it to a tax on tobacco. Tobacco consumption has two main negative externalities², the impact of second-hand smoke and the increased health care costs (financial externality). The first is an obvious negative externality because an individual who is not a smoker is incurring the negative health impacts of the cigarette smoke. However, the second stated negative externality is less obvious. When an individual decides to smoke, that individual will increase his/her probability of health risks. On the surface, this would appear to be just an internality³, as people who smoke cause harm to themselves (Crosier and Enz et al.,2011). However, in economies with public health insurance, as it is the situation in Europe, society pays for the higher health care costs. For the USA, if a person is a participant in Medicaid or Medicare, society again pays for the higher health care costs. As for private markets, people participate in group health care plans and premiums are based on overall health care costs, so an increase in an individual's health care costs also increases the costs of others. (Crosier and Enz et al.,2011).

A tax on soft drinks is an example of a Pigouvian Tax⁴. Soft drinks, like cigarettes and alcoholic drinks, create a negative externality and the purpose of the tax is to force the market participants to take account of the additional cost to society. That means that by imposing a tax on soft drinks, government wants to increase economic efficiency. In order to achieve the optimal outcome for society, the amount of the tax should be equal to the external cost. But, this is not an easy task and the optimal outcome may not be achieved. However, even if the optimal outcome is not achieved, the outcome should be closer to optimal than a market outcome without a tax (Crosier and Enz et al.,2011 ;Hubbard and O'brien, 2006)

² Whenever the behavior of one economic agent affects for better or worse the well-being of another, without this to be taken into account by the price mechanism, we say that the agent is imposing an externality on the person affected. An externality may be positive or negative. An example of a positive externality is the consumption of education. In this case, consumers enjoy private benefits from education but also additional benefits to society arise by becoming more productive workers and better informed members of society (Crosier and Enz et al., 2011). On the contrary, an example of negative externalities is air pollution from the electricity generated by burning coal. This externality occurs in the production of the good. The producer has private production costs but also introduces additional costs to society by decreasing the air quality and increasing the probability of health ailments such as asthma (Crosier and Enz et al., 2011).

³ An internality is a term, introduced in 1993 and used in behavioral economics to describe those types of behaviors that impose costs on a person in the long-run that are not taken into account when making decisions in the present. An example of internality is the harm that people cause to themselves by smoking.

⁴ The name of this tax comes from the economist Arthur Pigou (1877 – 1959)

2. Which tax is the most appropriate?

In this part we will analyze the kind of tax that should be chosen. A tax on soft drinks is an excise tax which can be levied as a percentage of the price or it can be a fixed amount per unit of measurement. There is also a third kind of tax which is based on the calorie content

The excise tax burdens the manufacturers of soft drinks (that is, they are legally responsible for that tax) but, most of the times this tax is passed on to consumers with an increase in prices (Taxing sugarsweetened beverages: a survey of knowledge, attitudes and behaviours, 2012). Even if producers do not pass the tax on to consumers, this tax could lead to other positive outcomes. For instance, producers might decrease portion sizes or decrease the sugar in their products (Pomeranz, 2011, pp. 75-88).

2.1 Excise tax as a percentage of the price of soft drinks

In this case there is a great advantage as the revenue of the tax increases with the inflation. However, one can find ways to evade such a tax, e.g. bulk discounts. Another example is free refills as tax calculation is based on price and consumers pay tax only for the first cup which they buy (Pomeranz, 2011, pp. 75--88). Moreover, soft drinks are not expensive products as even well-known brands have low prices. Therefore the tax will be low and may not have an impact on soft drinks' consumption. For such reasons, this tax seems not to be the appropriate one. Research shows that it has had little to no effect on overweight or obesity for adults or children (Todd and Zhen, 2010).

2.2 Excise tax as a fixed amount per unit of measurement (e.g. ounce, liters etc)

The advantage of this tax is that it depends on quantity. That means that if the volume of a product is doubled, the amount of tax will be doubled too. That may discourage consumers from buying bigger quantities (Rivard and Smith et al., 2012, p. 18).

Additionally, this tax is better than an excise tax which is a percentage of the price as it can raise more stable revenue because it is less dependent on industry pricing strategies (Brownell and Farley et al., 2009, pp. 1599--1605). To make it more understandable, if a soft drink company decides to make a price discount, the latter will be affected by this price reduction while the former will remain intact. Moreover, the tax which is a fixed amount per unit of measurement has also the advantage in bulk discounts. For instance, if a company decides to offer a bigger quantity at the same price (i.e 1500ml + 500ml free), it will pay a tax for all the 2000ml and not only for the 1500ml.

Unfortunately, this tax has disadvantages too. Because it is a fixed amount, it does not rise with inflation (Rivard and Smith et al., 2012, p. 18). In order to avoid this problem, it is vital to enact tax laws which will require excise taxes to be adjusted with inflation regularly. In that way, erosion of prices and revenues over time can be prevented (Brownell and Farley et al., 2009, pp. 1599--1605).

2.3 Tax based on calorie content

This tax could be a flat tax on all soft drinks with, for example, 35 or more calories per 12-ounce serving. Alternatively, it could vary with the caloric/sugar content. For example, an excise tax might be 0 cents for drinks with fewer than 36 calories per 12 ounces; 3 cents for drinks with 36 to 70 calories; and 6 cents for drinks with 71 or more calories (Cspinet.org, n.d.). But, such a tax would make things more complicated. In addition, people would be encouraged to consume more diet soft drinks. Those drinks might contain few or no calories but, as the regular soft drinks, they are devoid of nutrients too. Moreover, the consumption of low-calorie soft drinks is not recommended because of their tooth-eroding acids, caffeine, and/or questionable artificial sweeteners (Cspinet.org, n.d.).

Thus, it seems that, from the three types of tax, the dominant one is the second one. A tax based on calories targets the source of harm, however, it is a more complicated tax and may encourage the consumption of diet soft drinks.

3. How is this tax expected to operate?

If a tax on soft drinks is imposed, consumers will have to pay more for soft drinks, assuming the tax is passed on to retail prices. This will lead to a reduction in soft drinks' consumption and a substitution towards 'healthier alternatives'. If tax increases persist, consumers may get used to consume the alternative products and, generally, this measure will succeed in changing individuals' spending and eating habits (Pettinger, 2013).

In Figure 2.1 below the effect of an excise tax (as a fixed amount per unit of measurement) on soda is shown. Initially, before-tax, the equilibrium price is P_{Market} and the equilibrium quantity is Q_{Market} . With the imposition of the soft drink tax, government achieves to convert the external cost of soft drinks' consumption in internal cost which is paid by consumers and producers of soft drinks (at least, in this figure). Now the total amount that consumers have to pay is bigger. Thus, at every quantity they are willing to pay less than they would have without the tax, so the demand curve for soda will shift down by the amount of the tax, from D_1 to D_2 . Now, the equilibrium quantity decreases from Q_{Market} to the efficient level, $Q_{\text{Efficient}}$. For $Q_{\text{Efficient}}$, costumers pay price P and producers receive price $P_{\text{Efficient}}$ which is the new equilibrium price. The difference between consumers' price and producers' price is the amount of tax (Rivard and Smith et al., 2012, p. 18).

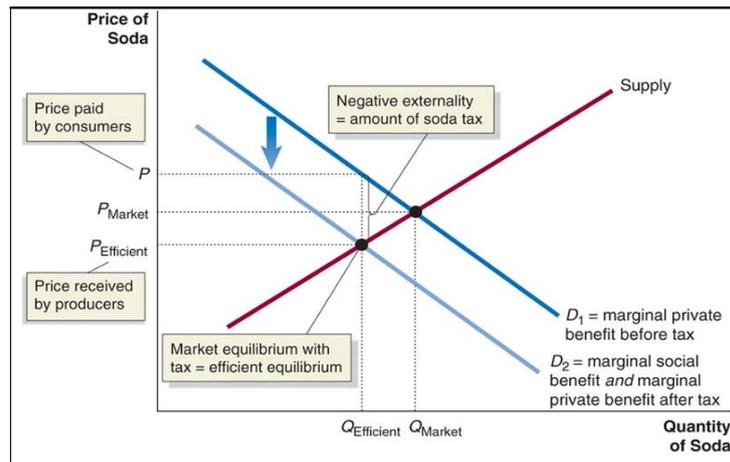


Figure 2.1: The soft drinks' market and the imposition of an excise tax

4. Earmarking the revenue

The imposition of a tax on soft drinks not only discourages people from consuming them, if it is high enough, but also provides revenue to the government. In order to have the desired result and to take full advantage, government should use the revenue from the tax in such a way as to help reduce obesity and not for unrelated purposes. Therefore, government could fund health-promoting programs, such as media campaigns in order to inform the public about the hazards of unhealthy goods and to promote a healthier lifestyle, encouraging physical activity and healthier diets. Moreover, it is important to offer healthier meals in schools, providing more fruits & vegetables in order children to get used to a balanced and correct diet from an early age and to increase physical education in schools. In addition, government can invest the revenue to create biking/hiking paths, inner-city basketball courts, swimming pools and parks (Cspinet.org, n.d.). It is also important that government helps people with low or even middle-income. For example, it could help them by providing better health services or receiving better quality foods through coupons so as to be sure that they will buy the healthier goods rather larger quantities of unhealthy goods.

5. Objections on soft drink taxation

5.1 Burden low-income people (Regressivity)

A tax on soft drinks may generate revenue and prevent consumption but, as most of measures, it has some disadvantages too. First of all, soft drink taxation is regressive which means that people with lower income have to pay more than high-income people if we estimate the amount of tax as a percentage of their income. For example, we take a low-income family, with earnings €10.000/yr, and a high-income family, with earning €100,000/yr, which consume the same quantity of soft drinks. Both of them will pay €100 in soft drink taxes but, the low-income family is paying 1/100th of their income in soft drink taxes, whereas the high-income family is paying 1/1000th of

theirs (Rivard and Smith et al., 2012, p. 18). Moreover, soft drinks, like fast foods and other unhealthy products, are goods which people with low income prefer to consume because of their low price. Thus, a tax on soft drinks will harm low-income people relatively more than those with high income.

Of course there is also a positive side as except from the health benefits of reduced consumption of soft drinks, low-income people can profit from the fact that most of them do not have (good) health insurance (Businessweek.com, n.d.). So, they have double benefit as with the reduction of soft drinks consumption, not only do they reduce the likelihood of having serious chronic diseases but also they can benefit from the new revenue which will fund expanded health care and many prevention programs some of which are only for low income people (Taxing Sugared Beverages Would Help Trim State Budget Deficits, Consumers' Bulging Waistlines, and health care costs, 2010)

5.2 "Nanny state" (Paternalism)

Another issue is that government is acting as a "nanny state" as by taxing soft drinks, it restricts personal choice. There are people who support that government has no right to interfere in citizens' lives and tell them what they can eat and drink. But, that it is not right because the rationale behind such a tax is to gain revenue and reduce soft drinks' consumption in order to help people gain healthier habits and not for other purposes as it is happened with other taxes (of course, that requires government's trustworthiness that it will use the revenue with the most appropriate way). Citizens should understand that a tax on soft drink is for their good (i.e they should accept some paternalism) and that it does not forbid their consumption but it makes them consume less quantity or substitute them with other products like water and fat-free or low-fat milk which are not taxed (Cspinet.org, n.d.).

5.3 Why tax only soft drinks and not snack foods or other junk foods?

There will be many people who will wonder why tax only soft drinks and not and other goods which contribute to weight gain like snack foods and junk foods. According to studies, beverages contribute to weight gain more than solid foods and soft drinks are the only individual beverages that have been directly linked to obesity. That occurs because when someone consumes a solid food, it is more likely not to consume other foods and therefore not to intake other calories. On the contrary, the consumption of soft drinks does not negate the intake of other food and hence, the calories from the soft drinks become "extra" calories. Another reason why soft drinks' taxation is more preferable than the taxation of snack or junk foods is that soft drink taxes would be easier to be collected because of the modest number of manufacturers (Cspinet.org, n.d.).

5.4 But the tax applies to whole society

Another disadvantage is that while the aim of this intervention is those people who are already or at risk of becoming obese, such as individuals who are overweight, it will affect everyone who consumes soft drinks regardless of their susceptibility to obesity, as the tax will be implemented across society as a whole (Jou and Techakehakij, 2012, pp. 83--90). Of course, this argument can not be absolute because the purpose is not only the reduction of soft drinks' consumption by people who are already or at risk of becoming obese but also the creation of a preventive measure especially in countries where obesity is low but rising (Jou and Techakehakij, 2012, pp. 83--90).

5.5 The tax may lead to job loss

There is an opinion that the soft drink tax, because it reduces soft drinks' consumption, it may lead to job loss. But, most of soft drinks' companies already produce and other kind of beverages, many of which would not be taxed. Moreover, it is very likely consumers substitute soft drinks with other beverages. Thus, this tax will encourage soft drinks' companies to produce drinks with less or no sugar and the redundant workers in soft drinks' sector, if any, will be passed to other sectors which are enhanced from expenditures of the tax revenues and from the money people diverted from purchasing beverages to other goods (Cspinet.org, n.d.).

5.6 The tax may hurt businesses

Such a tax and its implied reduction in consumption causes the reaction of soft drinks companies. One of their arguments is that soft drinks are not the only good that may lead to overweight or obesity and that with this taxation government stigmatizes their companies.

Those industries, in their effort to convince the government not to impose the soft drink tax, make several actions. Coca-Cola, for instance, suspended a planned investment in France as a "symbolic protest" after Prime Minister Fillon announced a soft drink tax in August 2011 (Jou and Techakehakij, 2012, pp. 83--90). Another example is PepsiCo which threatened to move its corporate headquarters out of New York when the state considered implementing an 18% sales tax on sugar-sweetened beverages (Brownell and Farley et al., 2009, pp. 1599--1605). Additionally, the beverage industry in America has created a front group with the community involvement which is called Americans Against Food Taxes (Brownell and Farley et al., 2009, pp. 1599--1605). Therefore, it seems that the government has to face a very tough opponent.

Chapter 3

Taxing soft drinks: A questionnaire analysis

In this chapter we analyze the results from a questionnaire on soft drinks consumption, obesity and taxation.

1 Background and methodology

The results of this survey come from a total of 407 Greek people. The survey was conducted by telephone and e-mails during the period 29/12/2013 - 31/1/2014 and people were chosen randomly.

Sampling error estimation depends upon the sample size. According to statistical theory, for a sample of 407 people with confidence level 95%⁵, the maximum sampling error is +/- 5.0 percentage points⁶. The maximum sampling error is based on percentages in the middle of the sampling distribution (percentages around 50%)⁷.

In this questionnaire, people were asked about soft drinks consumption, obesity and the case of a tax on soft drinks.

2. Key findings

About soft drinks consumption, it seems that 32% of respondents consume them every day (9%) or two to three times per week (23%), while 68% drink them two to three times per month (33%) or very rarely (35%).

Regarding the consequences of frequent consumption of soft drinks, 94% of respondents believe that it increases the probability of someone to become overweight or obese and 86% believe that it may make someone addicted to soft drinks.

There is also nearly unanimous agreement among respondents about obesity in Greece. More particularly, 87% believe that obesity is a serious problem in Greece and the same amount of people believe the same about obesity problem in Greek youths.

Moreover, obesity and all the diseases that this entails seem to play a vital role for respondents as 84% believe that they affect the cost of health care while a smaller percentage of them (49%) believe that they affect the amount of taxes they pay.

⁵ The 95% confidence level means we can be 95% certain.

⁶ A confidence interval of 5 means that if 47% percent of our sample picks an answer, we can be "sure" that if we had asked the question to the entire relevant population between 43% (47-4) and 51% (47+4) would have picked that answer.

⁷By <http://www.surveysystem.com/sscalc.htm>

9% believe that government is not doing enough to fight obesity while 95% believe that the fight against obesity is an issue which can be solved by family (26% only by family and 69% combination of government and family but more by family).

People were also asked about the case of a 10, 5 and 2 cents tax per 330ml of soft drinks (tax increases with quantity). The majority of them answered that these taxes would not change their soft drinks consumption. More particularly, for a tax of 10, 5 and 2 cents, people who would consume the same amount of soft drinks are 61%, 72% and 80% respectively. But most of them support a tax on soft drinks and mostly the largest one. For a 10 cents tax, 55% supports it; for a 5 cents tax, the support is 52% and for the 2 cents tax, it is 48%.

For those who are against the tax, the main reason is that they believe it is not an effective measure (37%) and that government would not use the revenue in the most appropriate way (23%).

About revenue earmarking, most of the respondents would like the revenue to be used in order to inform people about the risks of unhealthy food consumption and promote a healthier lifestyle (44%) and to offer healthy foods at schools (29%).

Last, 60% of people believe that other practices such as the reduction of soft drinks' accessibility in public places or the restriction of vending machines are more effective than a tax on soft drinks. But, 85% believe that a current investment in order to promote a healthy diet and encourage greater physical activity will reduce the cost for medical care in the future.

3 Question by question analysis

3.1 Personal information

Gender (Question 66)

From the individuals who took part in this research, 220 are women (54%) and 181 are men (44%). Also, there were 6 people (2%) who did not answer.

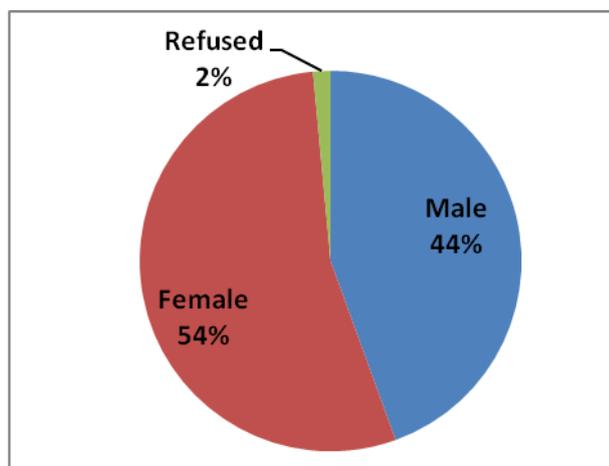


Figure 3.1: Respondents' gender

Age (Question 65)

Most of the individuals are young as 105 of them belong to age group of 18-24 years old (26%) and 101 people have age between 25-34 years old (25%). 70 people belong to age group of 35-44 years old (17%) and 72 have the age of 45-54 years old (18%). For older ages, the percentage falls more as 41 have the age of 55-65 years old (10%) and only 14 people are more than 65 years old(3%). The individuals who did not response are 4 (1%).

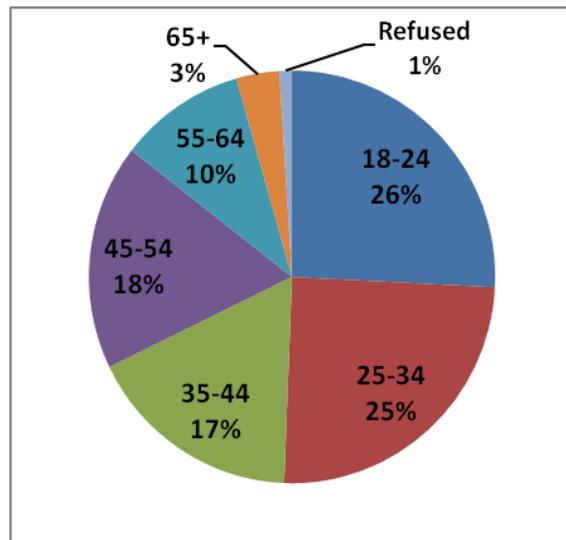


Figure 3.2: Respondents' age

Geographical Region (Question 67)

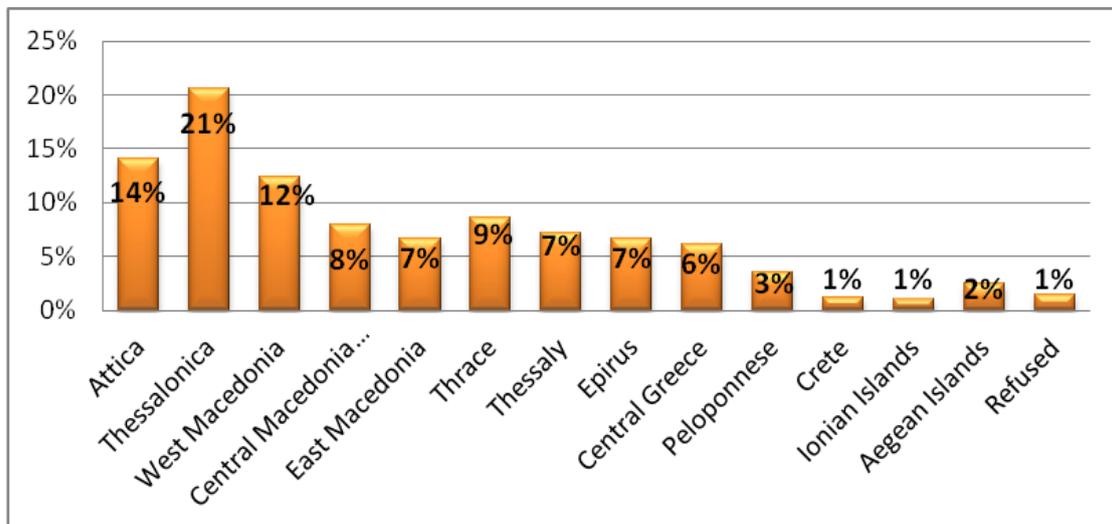


Figure 3.3: Respondents' place of origin

As regards the geographical region, most people are from Attica, Thessaloniki and West Macedonia. Most specifically, 83 people are from Thessaloniki (21%), 57 are from Attica (14%) and 50 from West Macedonia (12%). About the other regions, 35 are from Thrace (9%) and 32 from Central Macedonia (except Thessaloniki) (8%). Thessaly, East Macedonia and Epirus have the same percentage of individuals. More particularly, from Thessaly are 29 individuals (7%), and from East Macedonia and Epirus are 27 people (7%) in each region. The rest regions are Central Greece with 25

individuals (6%), Peloponnese with 14 people (3%), Aegean Islands with 10 people (2%), Crete with 5 (1%) and Ionian Islands with 4 (1%). The individuals who did not answer are 6 (1%).

Educational level (Question 68)

About the educational level, 143 from 407 individuals are college graduates (35%), followed by the high school graduates with 125 persons (31%). The rest 34% consists of 63 people who are college students (15%), 56 persons who have a postgraduate degree (14%), 7 people who have education less than high school (2%) and 6 who have a doctoral degree (1%). The last 2% are 7 people who did not response.

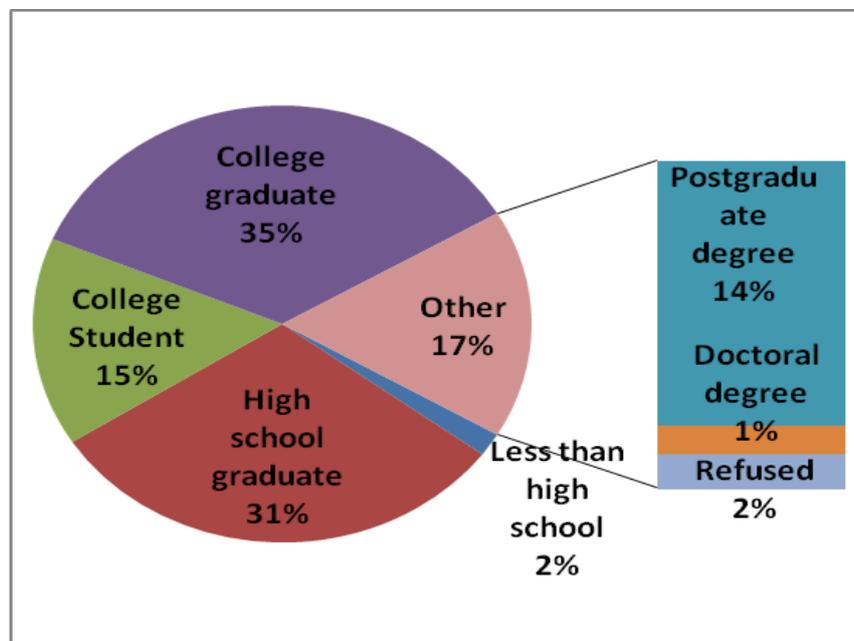


Figure 3.4: Respondents' educational level

Individual income (in euro) (Question 69)

As regards individual income, it seems that the highest percentage (33%) is people with low or no income (0-5.000 €). But from 133 people who belong to this category, 68 (51%) are persons with age 18-24 years old and 51 (38%) are 25-34 year old people. Thus the 89% of persons with low income are young.

Generally, we can see that as income increases, the percentage of people who belong in the higher category decreases. More specifically, the category of 0-5.000 € income is followed by the one of 5.000-12.000 € with 81 individuals (20%) and the highest

percentage here are people of 25-34 years old. After that, is the income group of 12.000-16.000 € with 73 people (18%) and the income group of 16.000-26.000 € with 66 people (16%). In both income' categories, the pattern according to age groups is the same with the highest percentages being people with age of 45-54 and 35-44 years old.

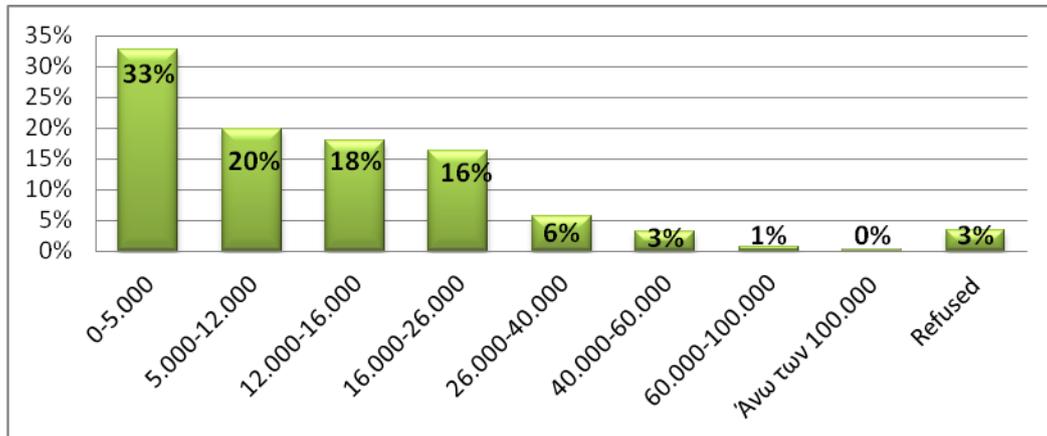


Figure 3.5: Individual income (in euro)

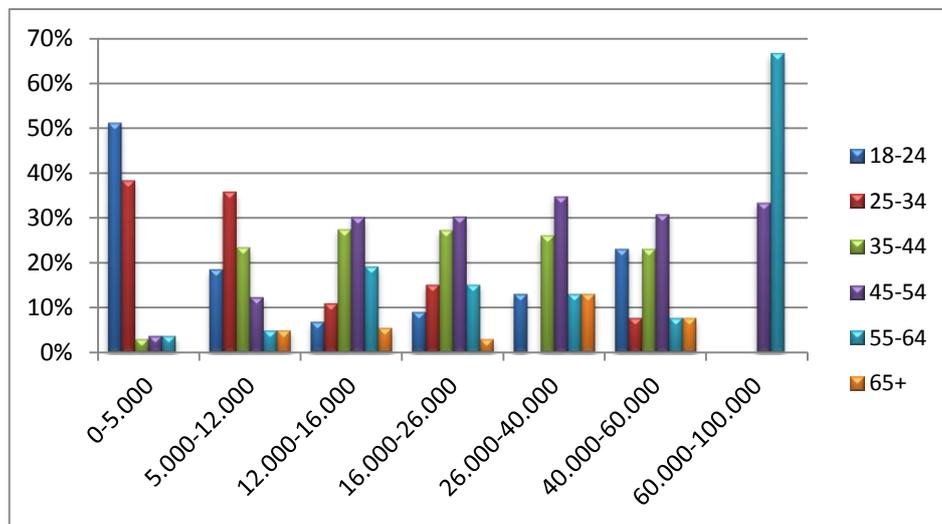


Figure 3.6: Age of people who belong in each income category

For income more than 26.000 €, the percentage is considerably reduced as only 10% of respondents have income more than 26.000 €. Particularly, 23 individuals have income of 26.000-40.000 € (6%), 13 individuals have income of 40.000-60.000 € (3%), 3 have income of 60.000-100.000 € (1%) and only one respondent has income more than 100.000 €. For these categories, because of the small number of people, it

would be better not to take their responses into account in this case. Also there were 14 people who did not answer (3%).

Expenditure is more, less or equal to income (Question 70)

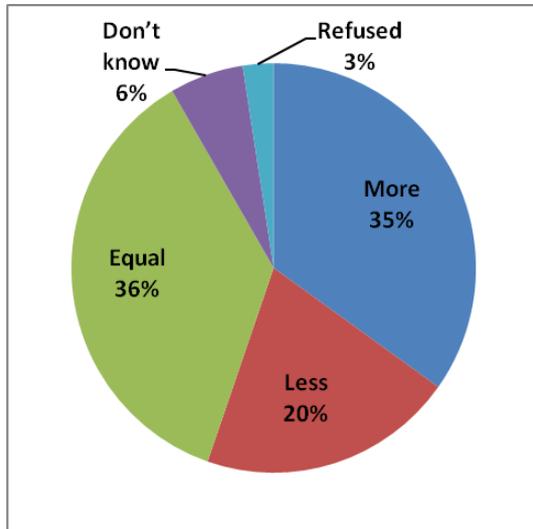


Figure 3.7: Expense is more, less or equal to income

In the answer “Your expense is more, less or equal to your income?”, most people (148 of 407) answer that their expense is equal to their income (36%). With small difference, 142 people answer that their expense is more than their income (35%) and 20% answer that their expense is less than their income. The remaining 9% is divided into 24 people who answer that they do not know if their expense is more, less or equal to their income (6%) and 10 people who did not answer in that question (3%).

Politics (Question 71)

People were also asked about their political beliefs. The great majority of them (60% or 244 people) answered that they do not support a specific party and it is something that shows the disappointment of Greek people as Greece is in a period of economic crisis. The next 40% is divided in the five categories of political parties. More specifically, the right parties have 12% and the centre-left parties have 8%. There is also a tie between left and centre-right parties with 7% each one.

The lowest percentage has the centre with 3% and there was another 3% who refused to answer.

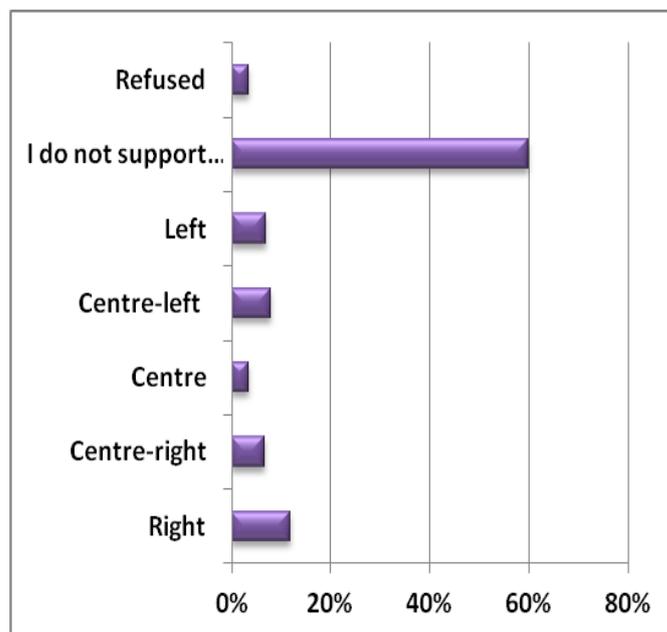


Figure 3.8: Political beliefs

% of overweight and obese adults per household (Question 74)

In Figure 3.9, we can see the percentage of overweight or obese adults in a household. About obese adults, the majority of respondents answered that none of them are obese (70%) and in the 10% of households until half of adults are obese while more than half is the 6%. Thus, the 16% of households have even one obese person.

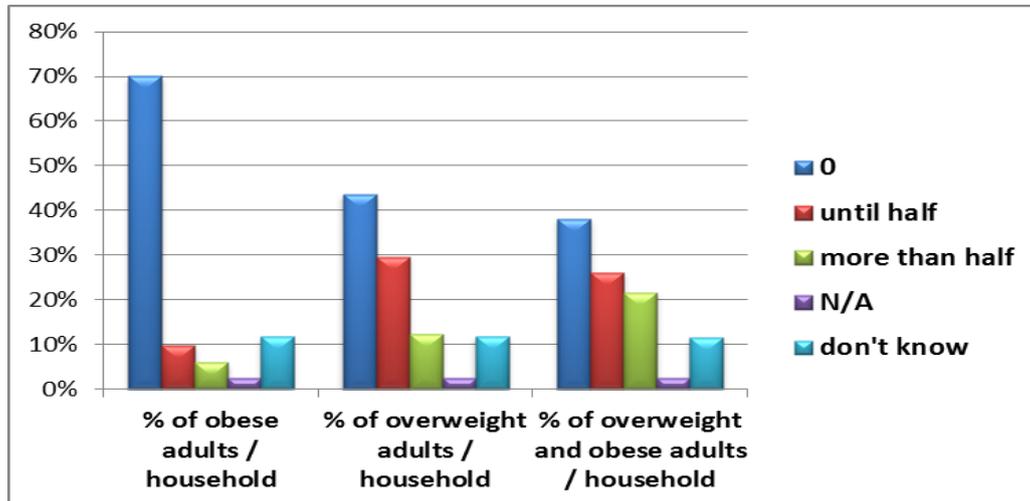


Figure 3.9: % of overweight and obese adults per household

As regards the overweight adults, the results are smoother: 44% of households do not have overweight adults; for 30% of respondents, the overweight individuals are up to half of them in the household; and for 12% of respondents, the overweight individuals are more than half of them in the household. Therefore, the 42% of households have even one overweight person.

If we take now the households which have overweight or/and obese adults, the results become even smoother. In particular, the percentage of households which have normal weight adults is 38%, the percentage of households with until half overweight or/and obese adults is 26% while more than half overweight or/and obese adults have 22% of households.

In all the three cases, there is 2% of respondents who did not answer and a substantial proportion of 12% of respondents who did not know what to answer.

% of overweight and/or obese minors per household (Question 74)

The same question was asked for the minors in households. Here the results are different as the majority of households do not have overweight or obese children. More particularly, as regards the households with obese minors, 77% of them do not have even one while the equivalent percentage for the households with overweight

minors is 69%. For the households with overweight or/and obese children, this percentage is 68%.

The percentage with overweight or obese children in households is extremely low, 7% and less, while the respondents who did not answer or did not know what to answer is 10% each.

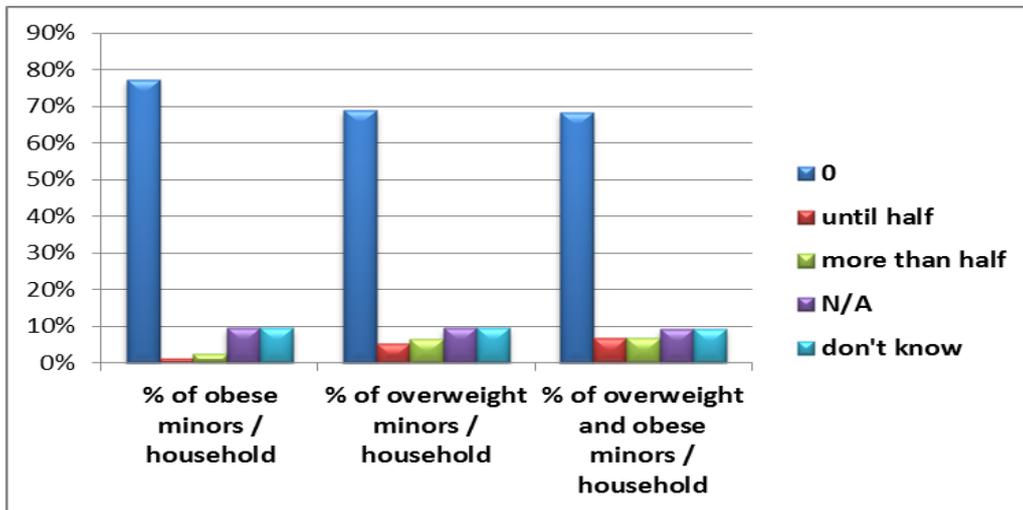


Figure 3.10: % of overweight and obese minors per household

But, in these results we must take into account that from 407 respondents the 240 do not have minors in their household. Thus the answers here are 167, less than half of the whole sample and they are not sufficient.

3.2 Soft Drinks consumption

Consumption of soft drinks, milk and 100% fruit juices (Questions 1-4)

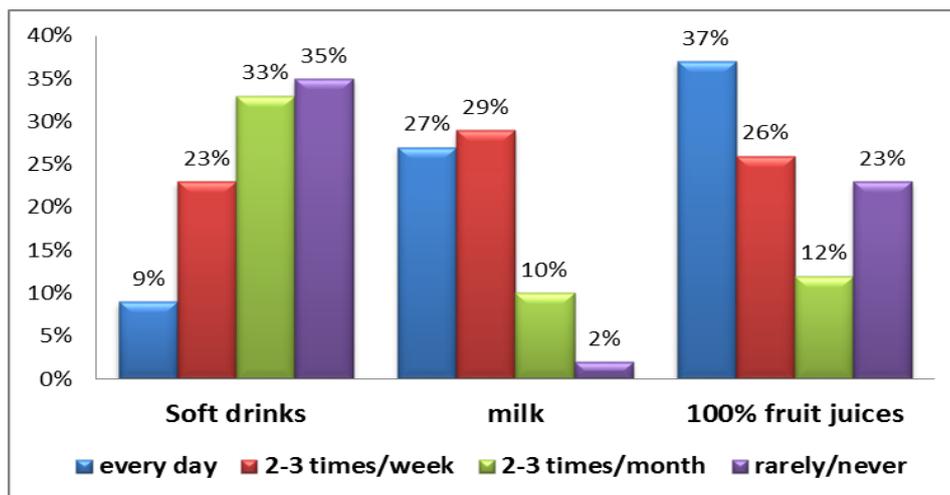


Figure 3.11: Consumption of soft drinks, milk and 100% fruit juices

In this questionnaire people were asked how often they consume soft drinks, milk and 100% fruit juices. The answers are presented in Figure 3.11 and discussed below.

Consumption of soft drinks (Questions 1-2)

About soft drinks, most people (141 of 407) respond that they do not habituate to consume soft drinks (35%) and with small difference follow people who consume them two to three times per week (33%). 23% of respondents answer that they consume soft drinks two to three times per week (95 people) and only 9% consume them every day (35 people).

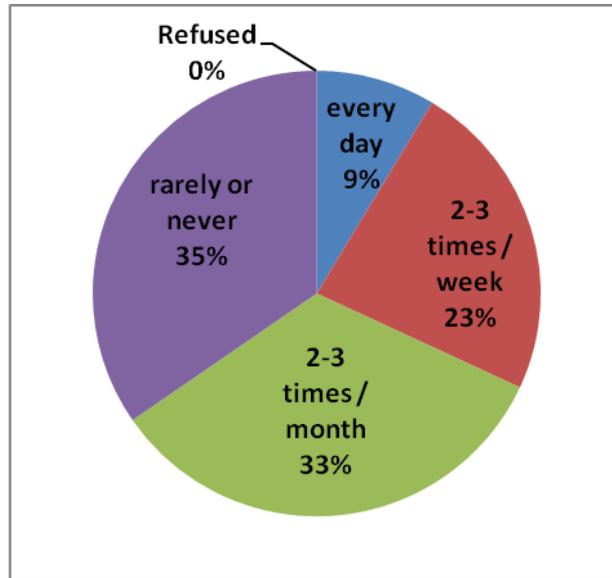


Figure 3.12: soft drinks' consumption

Considering only the people who consume soft drinks every day, the 86% of them drink one to three glasses every day. More specifically, the 46% drink 1 glass per day (16 people) and 40% drink two to three glasses (14 people). The remaining 15% are 2 people who drink four to five glasses (6%) and 3 persons who drink more than 5 glasses (9%). (figure 3.13)

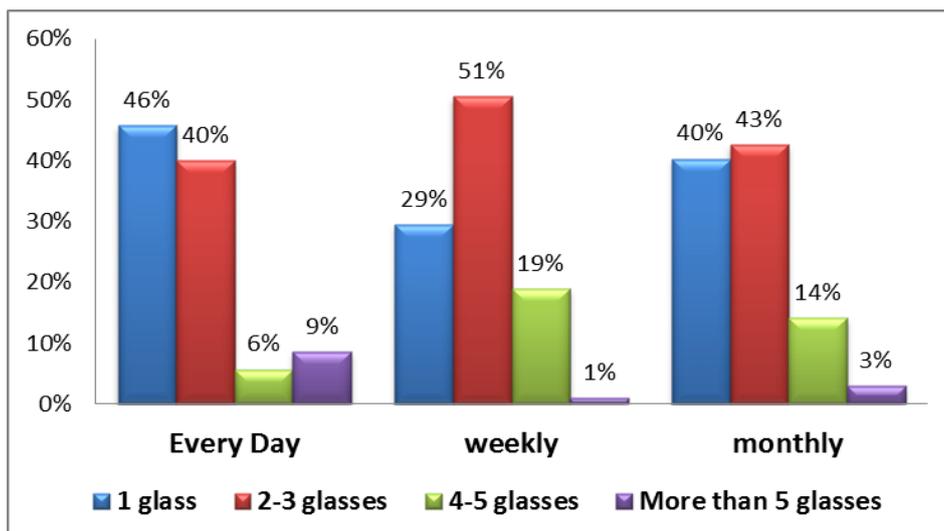
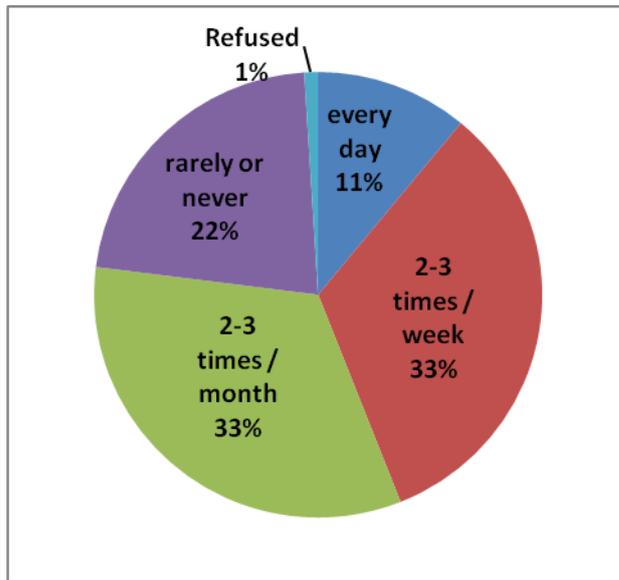


Figure 3.13: Soft drinks consumption measured by glasses

About respondents who consume soft drinks two to three times per week, 48 of them drink two to three glasses per week (51%), 28 individuals drink 1 glass (29%), 18 people consume four to five glasses (19%) and only 1% drink more than 5 glasses (1 person).

From people who consume soft drinks two to three times per week, 43% answer that they drink two to three glasses per month (57 people) and 40% answer that they drink 1 glass (54 people). For the rest 17%, 14% answer that they drink four to five glasses (19 people) and only 3% consume more than 5 glasses (4 people).

Consumption of 100% fruit juices (Question 4)



About the consumption of 100% fruit juices, the highest percentage of people (33%) drink 100% fruit juices two to three times per week (136 people) and the same amount of people drink them two to three times per month. Also, 87 individuals do not tend to drink 100% fruit juices (22%) and only 46 persons consume them every day (11%). The remaining 1% is people who did not respond.

Figure 3.14: Consumption of 100% fruit juices

Consumption of milk (Question 3)

When individuals were asked how often they consume milk, 152 answered that they drink milk every day (38%) and 106 that they drink two to three times per week (26%). The 23% answered that they rarely or never consume milk (95 people) and the 12% answered that they drink two to three times per month (50 people). Also, there were a 1% that did not response (4 people).

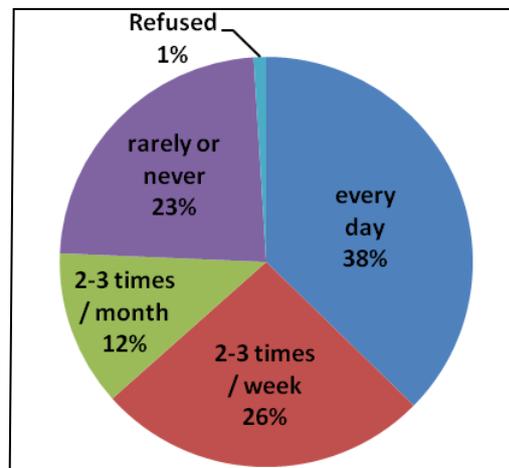


Figure 3.15: Consumption of milk

Soft drinks' consumption by children compared with adults' consumption within a household (Question 6)

Respondents were asked to compare the soft drinks' consumption by children with this by adults in their household. 30% of them answered that there are no children in the household. For the rest 70%, the answers are presented below.

35% of people believe that children in their household consume soft drinks less than the adults (101 people). Very close to this percentage is the answer that children's and adults' consumption are about the same as 95 people believe that (33%). Additionally, 25% believe that children drink soft drinks more than adults (71 people) and 4% they do not know (11 people). The last 3% are people who did not respond (8 people).

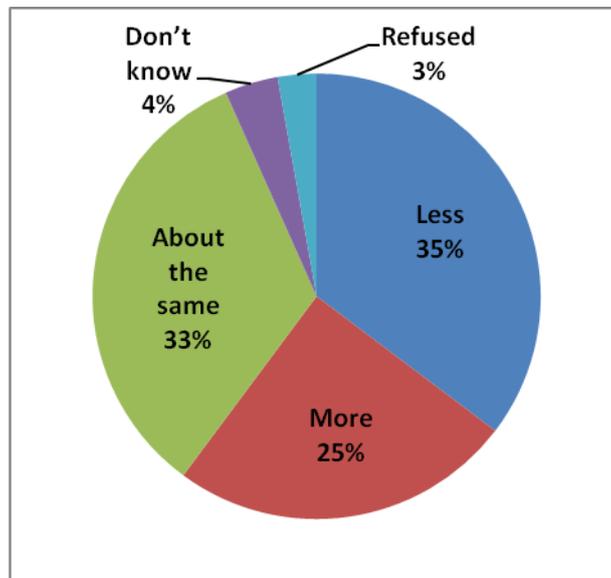


Figure 3.16: Soft drinks' consumption by minors compared with adults' consumption of a household

Frequent consumption of soft drinks and the probability of someone to become overweight or obese (Question 5)

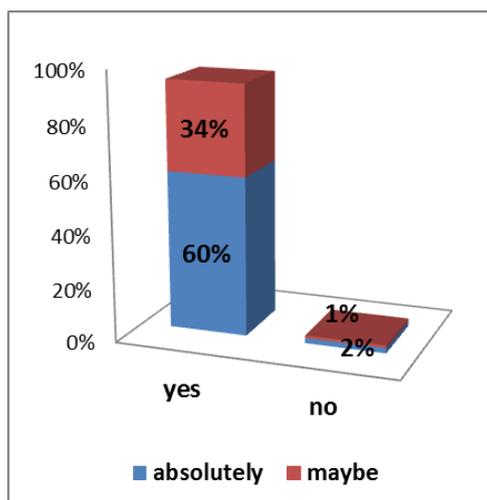


Figure 3.17: Does frequent consumption of soft drinks increase the probability of someone to become overweight or obese

As we can see in the diagram, there is nearly unanimous agreement (94%) among respondents that the frequent consumption of soft drinks increases the probability of someone to become overweight or obese (381 people). More specifically, 60% strongly believe that statement (243 people) and 34% somewhat believe so (138 people). On the contrary, only 3% believe the opposite with 1% strongly believe that (4 people) and the rest 2% somewhat believe so (10 people). The remaining 3% are people who do not know (2%) and people who refused to answer (1%).

Soft drinks' consumption and addiction (Question 7)

When people were asked if they believe that the frequent consumption of soft drinks can cause addiction, the answers were similar with those of the previous question. More particularly, 348 of 407 people (86%) believe that the frequent consumption of soft drinks can cause addiction. From those 348 people, 194 (48%) somewhat believe that and 154 (38%) strongly believe so. Oppose in this statement are only 32 people (8%) with most of them being somewhat opposed (6%) and 2% being strongly opposed. The last 6% are people who did not know what to answer.

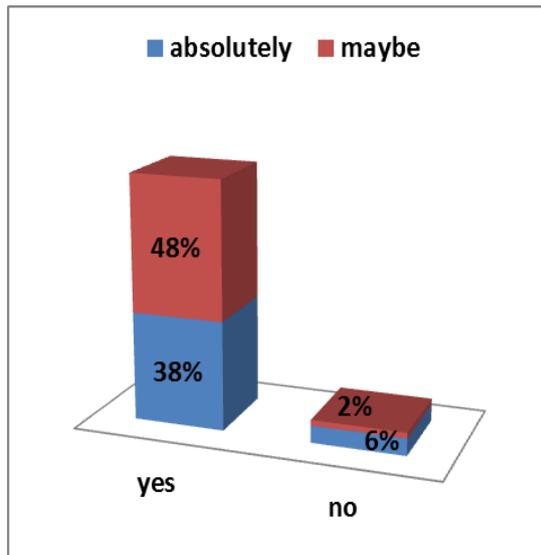


Figure 3.18: Can frequent consumption of soft drinks cause addiction?

3.3 Obesity

The seriousness of the obesity problem in Greece (Question 8)

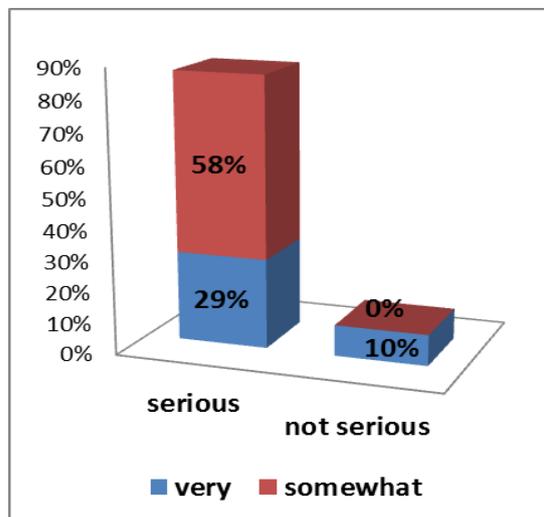


Figure 3.19: how serious is obesity problem in Greece

When people were asked about the seriousness of the obesity problem in Greece, the highest percentage of them believes that this problem is serious (87%). From this 87%, 58% (235 people) believe that obesity in Greece is somewhat serious and 29% (120 people) believe that it is very serious. On the contrary, only 10% of respondents believe that it is not a serious problem. The rest 3% are people who did not answer or they did not know what to answer.

The seriousness of the obesity problem in Greek youths (Question 9)

When respondents were asked about the seriousness of obesity problem in Greek youths, they gave the same answers with the previous question. The number of people

who gave the same answer is slightly different from the corresponding answers to the previous question so the percentages do not change.

Obesity comparison between today's children and 10 years ago (Question 10)

In the question if respondents believe that today's children are more, less or the same overweight with them 10 years ago, 71% of them (289 people) believe that they are more overweight and 16% believe that they are the same overweight. The remaining 13% are people who believe that they are less overweight (only 7%) and people who do not know (6%).

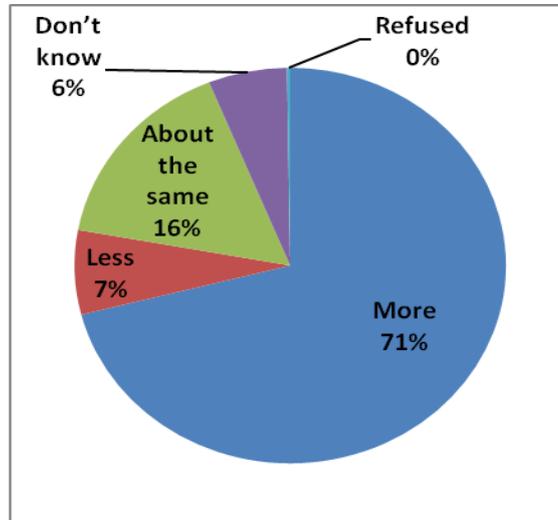


Figure 3.20: Obesity's comparison between today's children and those 10 years ago

The importance of obesity, and all the diseases that this entails, in the overall cost of health care (Question 11)

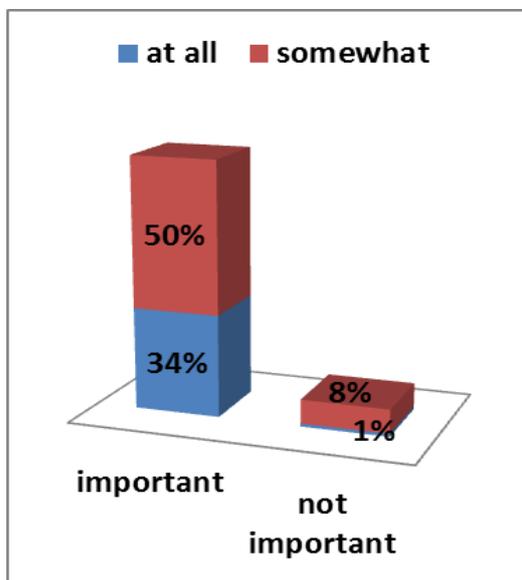


Figure 3.21: The importance of obesity, and all the diseases that this entails, in the overall cost of health care

It is also vital the percentage of people who believe that obesity, and all the diseases that this entails, has an important effect in the overall cost of health care as it constitutes the 84% of answers. More specifically, the 50% of respondents (204 people) believe that it plays somewhat important role and the 34% (139 people) believe that this effect is very important. Contrary, oppose of this view is only the 9% of respondents with the 8% (31 people) believing that the effects are not so important. The last 7% are people who do not know (6%) or did not answer (1%).

The importance of obesity, and all the diseases that this entails, in the amount of taxes respondents they pay (Question 12)

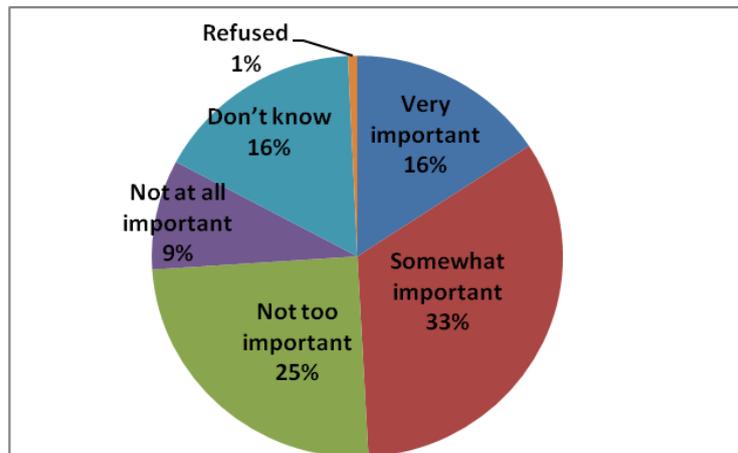


Figure 3.22: The importance of obesity, and all the diseases that this entails, in the amount of taxes paid

People were also asked about the importance of obesity, and all the diseases that this entails, in the amount of taxes they pay. Here, the views are not as clear as in the previous question but it seems that the majority of respondents (49%) believe that they play a great role in the amount of taxes. More particularly, the 33% (136 people) believe that they are somewhat important and the 16% (64 people) very important. Opposite to that view is the 34% of respondents with the 25% (101 people) believing that they are not too important and the 9% (36 people) not at all important. In this question, it is very interesting that the number of people who did not know what to answer reaches 16% (67 people). The rest 1% are people who did not answer.

Is government doing enough to fight obesity? (Question 13)

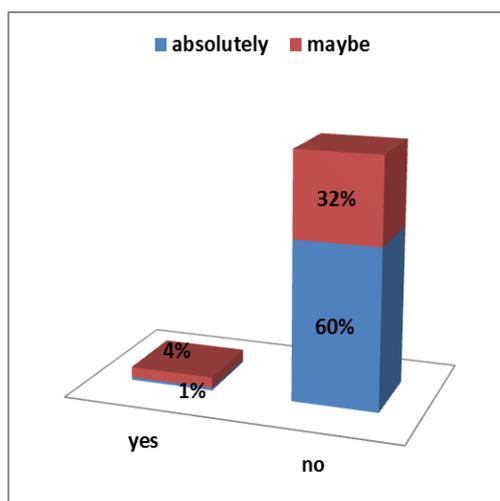


Figure 3.23: Is government doing enough to fight obesity?

As we can see in the figure, the greatest percentage of respondents (92%) believes that government does not do enough to fight obesity. More specifically, 60% of them strongly believe that (243 people) and 32% (130 people) somewhat believe that. On the contrary, only 5% (18 people) of respondents believe that government tries to deal with obesity with 4% believing that in a somewhat way. The rest 3% are people who did not know what to answer.

Whose issue is the fight against obesity? (Question 14)

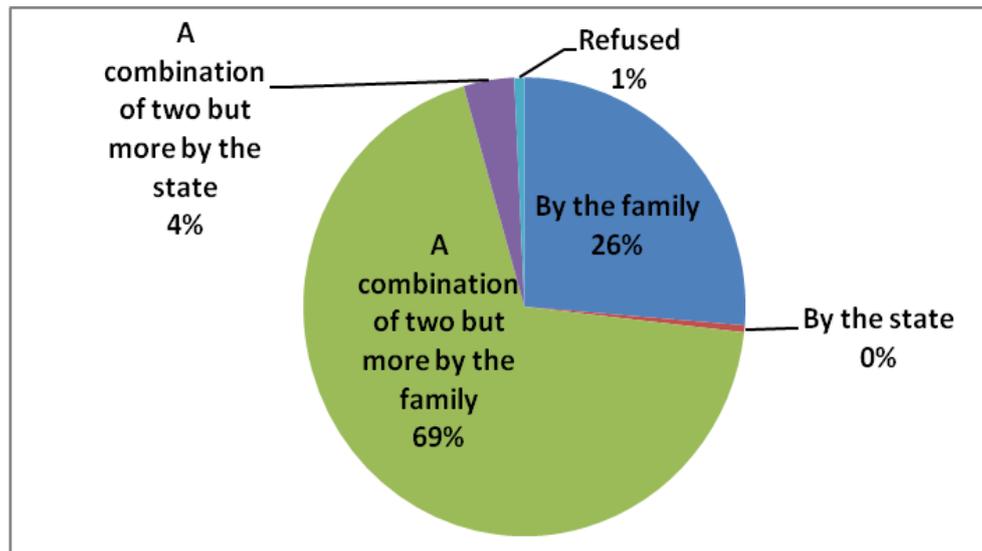


Figure 3.24: The obesity problem can be solved:

In the question “whose issue is the fight against obesity”, the majority of people (95%) believe that the fight against obesity is an issue which can be solved mostly by the family. Particularly, the 69% (280 people) believe that it is an issue which can be solved by the combination of family and government but mostly by the family and the 26% (107 people) answer that it can be solved only by the family. On the contrary, only the 4% (15 people) support that it is mostly a government’s issue but they still support the combination of the two with greater weight to the government

Childhood obesity and investing on its prevention (Question 15)

Moreover, people were asked to answer with which of the following statements they agree the most:

- (1) Childhood obesity is an important issue and we need to invest more in preventing it right now.
- (2) Childhood obesity is an important issue, but we should wait until the economy improves before we invest more in preventing it .
- (3) We shouldn’t invest more in preventing childhood obesity, no matter what happens in the economy.

Although Greece is in a bad financial situation, 88% (359 people) believe that we need to invest more in preventing childhood obesity right now. 5% of them (22 people) believe that we should invest later and only 1% (4 people) believes that we should not invest in childhood obesity’s prevention. The remaining 6 % are people who did not know what to answer (5%) and people who refused to answer (1%).

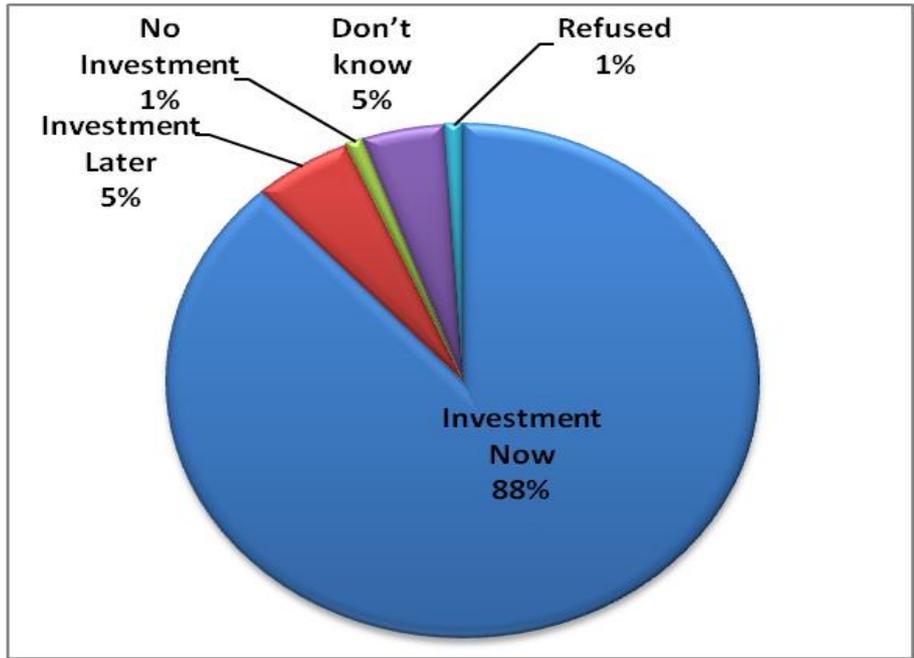


Figure 3.25: Should we invest about childhood obesity now, later or never?

3.4 A tax on soft drinks

A tax on soft drinks and individual behavior (Question 16)

The answers in the question if a tax on soft drinks will change the individual's behavior is not so clear as the proportions are 43% yes and 50% no. Particularly, 21% (84 people) answer absolutely no and 29% (120 people) answer maybe no. 29% (119 people) are also the percentage of people who answer maybe yes and the lowest percentage of respondents (14%) answer absolutely yes (55 people). Additionally, there is a 6% that they did not know what to answer and a 1% that they refused to answer.

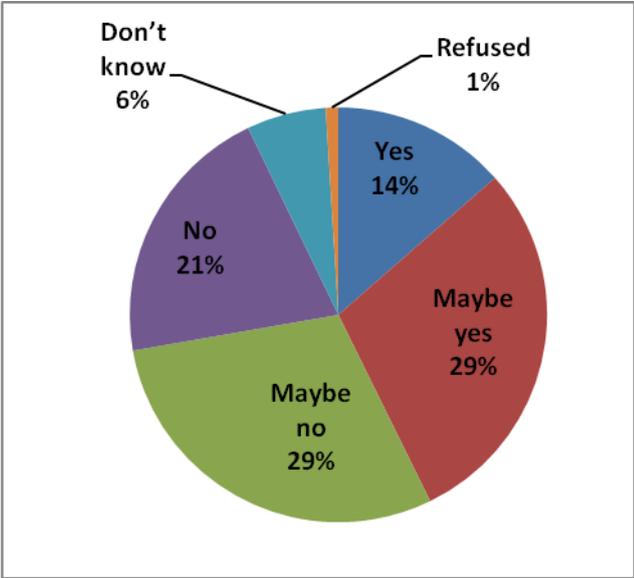


Figure 3.26: will a tax on soft drinks change the individual's behavior?

A tax of 10, 5 and 2 cents per 330 ml on soft drinks and the soft drinks' consumption (Question 17-19)

Similar to the previous question, people were asked if they would consume soft drinks more, less or about the same in a case of a 10, 5 or 2 cents taxation (per 330 ml).

The main findings show that as the tax increases, the number of people who will continue to consume the same quantity of soft drinks decreases and the number of people who will consume less soft drinks increases. Nevertheless, the clear majority of respondents would continue to consume soft drinks in the case of this taxation.

More particularly, with a tax of 10 cents per 330 ml, the 61% (249 people) will continue to consume about the same amount of soft drinks and 25% (101 people) will drink less soft drinks.

On the contrary, with a tax of 5 cents per 330 ml, the 72% (293 people) will continue to consume about the same amount of soft drinks and 15% (60 people) will drink less soft drinks.

For the last case, a tax of 2 cents per 330 ml, the people who will continue to consume about the same amount of soft drinks reach the 80% (326 people) and the respondents who will drink less soft drinks are 28 (7%).

In all cases, there is a significant number of respondents (about 12%) who did not know what they would have done while the number of people who will consume more soft drink is extremely low and thus insignificant.

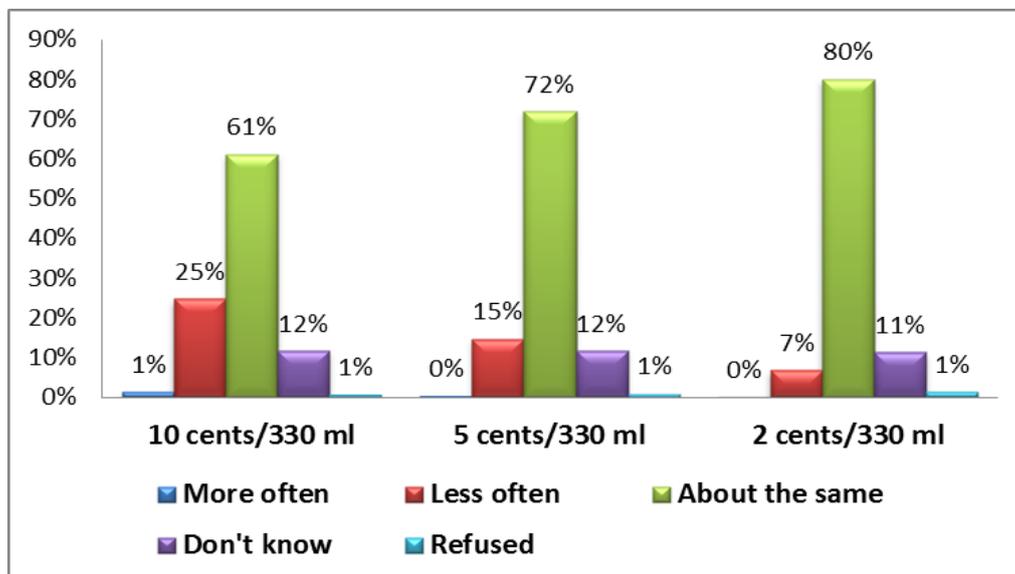


Figure 3.27: The soft drinks' consumption in the case of 10, 5 and 2 cents taxation (per 330 ml).

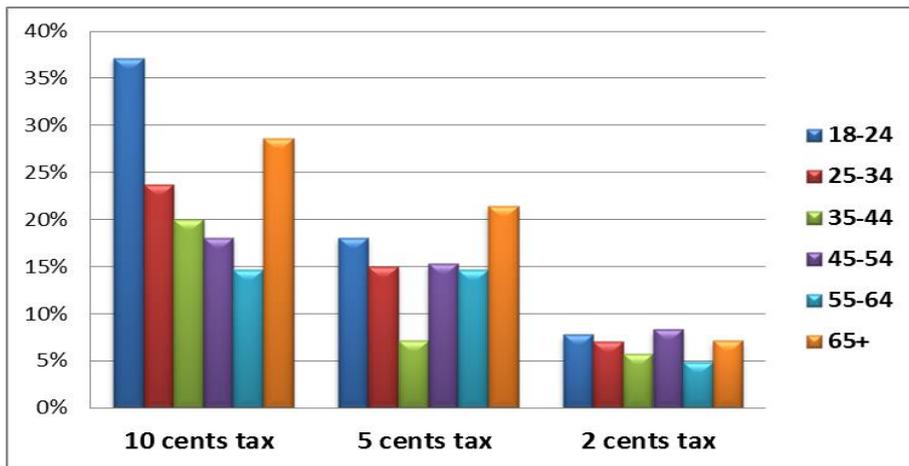


Figure 3.28: The percentage of people who would consume less soft drinks in the case of a tax –by age

In Figure 3.28 we can see how a tax affects the soft drinks’ consumption by age groups. For taxes of 10 and 5 cents per 330ml, the age groups that would consume less soft drinks are those of 18-24 and 65+.

More specifically, in the case of a 10 cents tax, 37% of respondents with age of 18-24 and 29% of respondents with age of 65+ would consume less soft drinks.

Respectively, in the case of a 5 cents tax, the respondents who would consume less soft drinks are the 37% of people with age of 18-24 and 29% of people with age of 65+.

About the tax of 2 cents, people who are affected more are those with age 45-54 years old but generally there are not differences among the age groups.

In the case of soft drinks’ taxation, will people continue to drink soft drinks or will they substitute them? (Question 20)

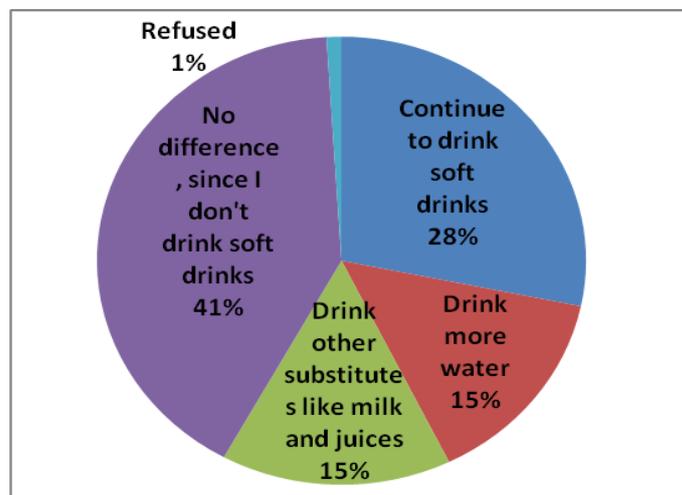


Figure 3.29: People’s reaction in soft drinks’ taxation

In this question, 41% (167 people) answered that it would not make any difference to them because they do not use to consume soft drinks and there was a 1% that refused to answer. The rest 58%, who are people that consume soft drinks, had to choose between soft drinks, water and other substitutes like milk and juices.

Taking into account only those three options, the majority of respondents, 49% (115 people), answered that they would continue to drink soft drinks. Second in respondents' preference, with 26% (62 people) are substitutes like milk and juices and then, with small difference, follows water (25% or 59 people).

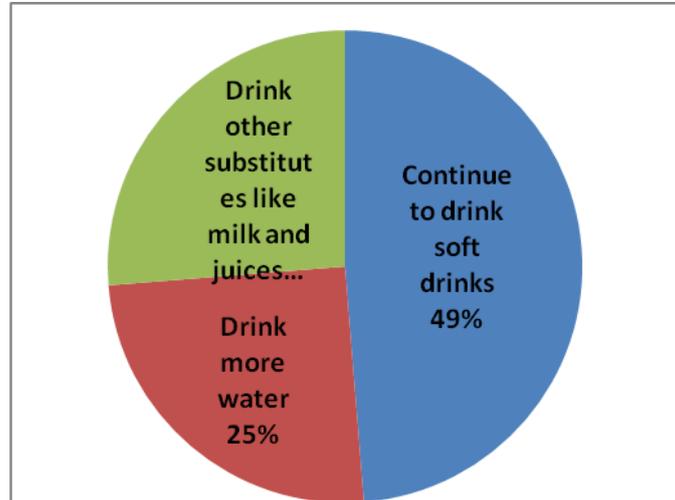


Figure 3.30: People's reaction in soft drinks' taxation

The support of a tax on soft drinks (Question 21-23)

People were asked if they support a tax of 10, 5 or 2 cents per 330 ml on soft drinks. In all the three cases, individuals seem to support the tax and the interesting thing is that as the amount of tax increases, the percentage of supporters increases too. Of course, this finding applies only for the taxes for which respondents were asked. These findings are discussed in more detail below.

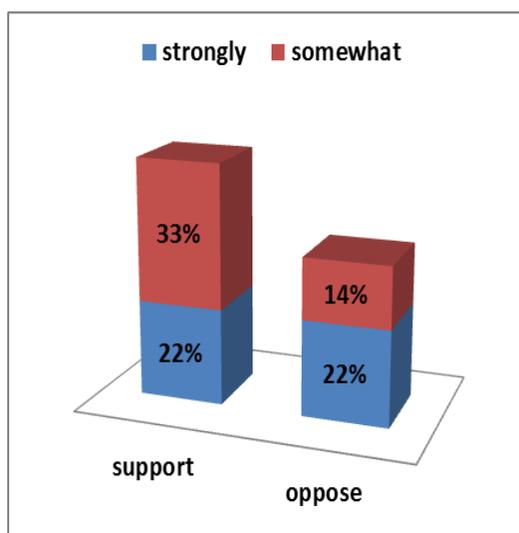


Figure 3.31: Support/ oppose of a 10 cents tax

For a 10 cents tax, 55% (223 people) are supporters with the 22% (88 people) being strongly supporters and the 33% (135 people) somewhat supporters. On the contrary, 36% do not agree with that tax. From that 36%, the 22% strongly oppose this tax and the 14% somewhat oppose it. Moreover, 8% of respondents did not know what to answer and the 1% refused to answer.

For the case of a 5 cents tax, the findings are similar to the previous ones with only some deviations. More particularly, 52% (212 people) support this tax with 33% (134 people) being again somewhat supporters and the 19% (78 people) being strongly supporters. As regards the respondents who were opposed, they are 37% (151 people) with 23% (93 people) being strongly opposed and 14% (58 people) somewhat opposed. The rest 11% are people who did not know what to answer (10%) and people who refused to answer (1%).

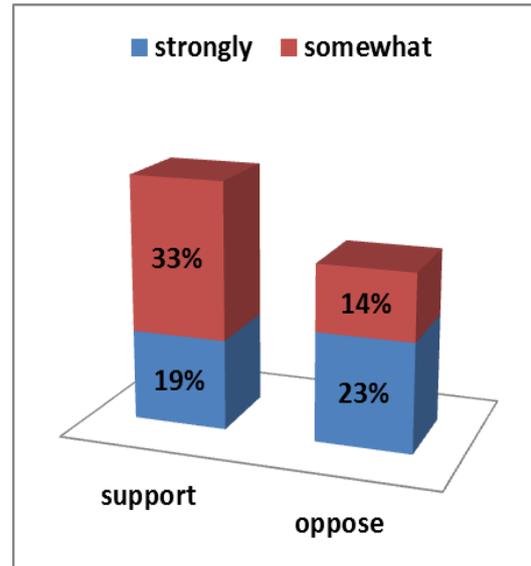


Figure 3.32: Support/ oppose of a 5 cents tax

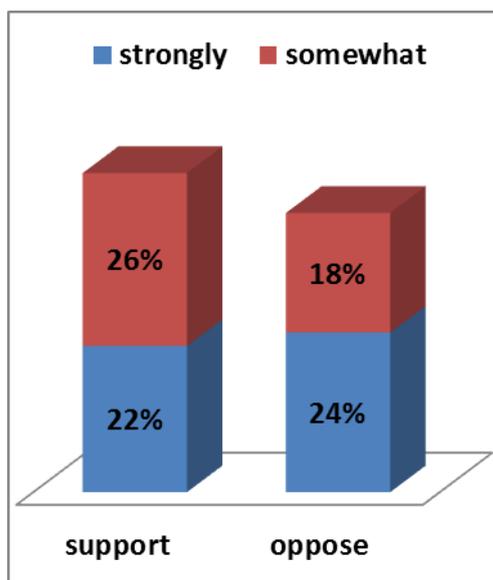


Figure 3.33: Support/ oppose of a 2 cents tax

In the case of a 2 cents tax, the difference between support and oppose is reduced more. Particularly, the 48% (196 people) of respondents are supporters with the reduction coming from the people who somewhat support this tax as they are the 26% (106 people) of respondents. On the contrary, the 42% (169 people) of respondents are opposed with the 24% (97 people) being strongly opposed and the 18% (72 people) somewhat opposed. The last 10% are people who did not know what to answer (9%) and people who refused to answer (1%).

In the next figure, figure 3.34, we can see the percentage of respondents who are in favor of a tax of 10, 5 or 2 cents per 330 ml by age groups.

In the case of a 10 cents tax, the respondents who support more the tax are those with age 18-24 and 65+ years old (70% of people with age 18-24 and 57% of people with age 65+). The remarkable here is that those two age groups are the same who are affected more by the 10 cents tax (they will consume less soft drinks) (figure 3.28).

For the other two taxes, the respondents who support more those taxes are people with age 18-24 and 35-44 years old.

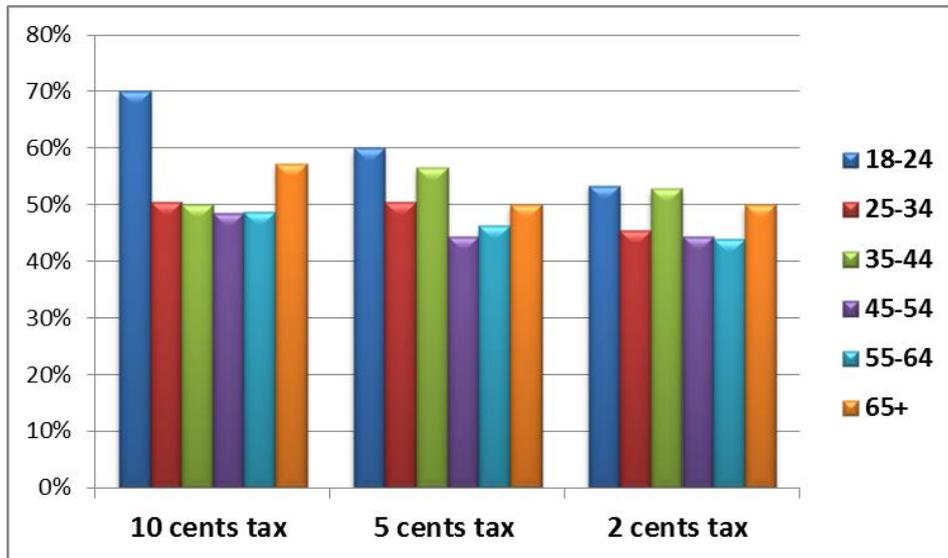


Figure 3.34: The percentage of people who support a tax on soft drinks- by age

Moreover, we can see the percentage of people who support a tax on soft drinks by educational level (figure 3.35). In all cases, the respondents who are more in favor of a tax are those who have a postgraduate degree and those who are college students, people with high education.

The pattern is clearer in the first two cases while in the third case the percentage of respondents who support the tax do not change a lot among the age groups (the only exception is people with education less than high school).

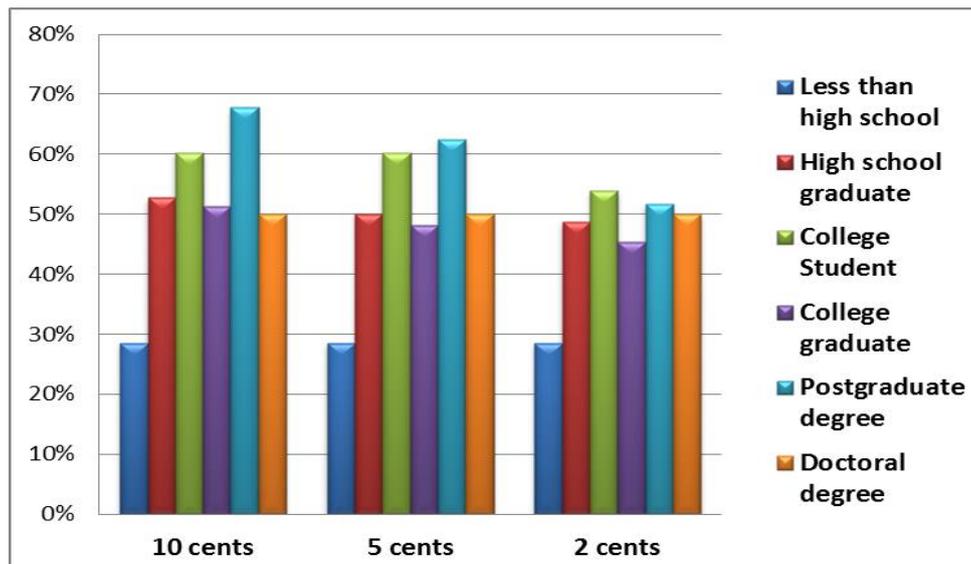


Figure 3.35: The percentage of people who support a tax on soft drinks- by educational level

Why do some people oppose a tax on soft drinks? (Question 24)

The great majority of people opposing the tax (70%) believe that a tax on soft drinks will not have the expected results. More specifically, 43% believe that this tax is not an effective measure and 27% (95 people) believe that government will not utilize the money properly. Moreover, 59 people (17%) believe that taxation in Greece is already very high so a measure like that is not desirable. The rest 13% is divided almost equally between the last two options. Particularly, 7% (25 people) believe that it will hurt the low income people and 6% (20 people) believe that government has no right to interfere in our personal lives and regulate what we eat and what we drink.

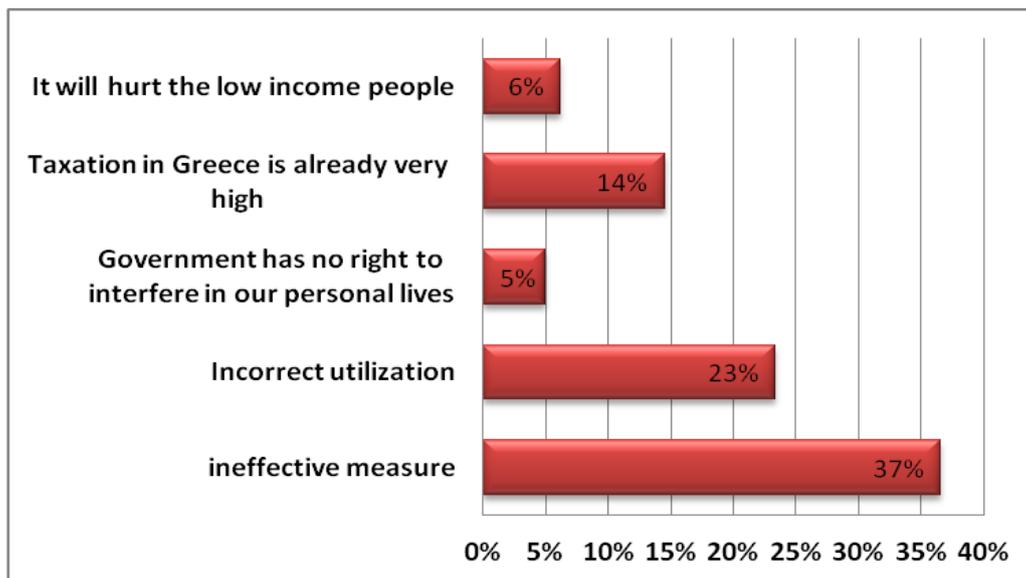


Figure 3.36: The reason why some people are opposed to a tax on soft drinks

Earmarking the revenue from soft drinks' taxation (Question 25)

Government can invest the revenue from soft drinks' taxation in many ways. When people asked to express their beliefs about that issue, 44% (181 people) suggest to inform the public (especially in schools) for the risk of unhealthy products and to promote a healthier lifestyle. With large difference from the first, 29% (118 people) believe that a good option will be the healthy food's offer in school in order to prevent the childhood obesity and children get used to a healthier diet. The next 21% is about the low income people. More specifically, the 14% of respondents (57 people) believe that government should invest that amount of money in providing better health services for people with low or middle income and the 7% (29 people) in enhancing people with low or middle-income to receive more qualitative goods through coupons. The last 6% are people who support an investment in order to reduce the government deficit (4% or 15 people) and people who refused to answer (2%).

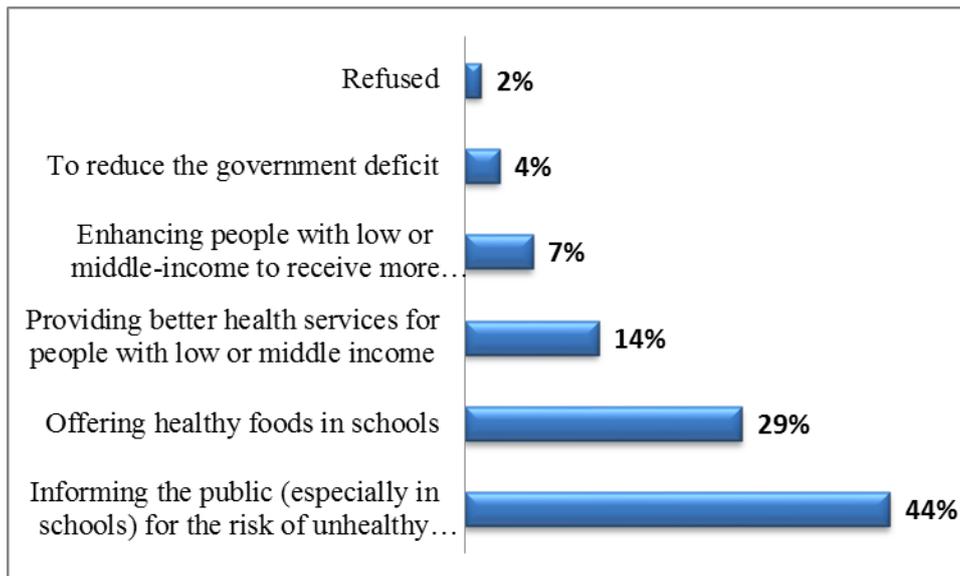


Figure 3.37: Earmarking the revenue from soft drinks' taxation

The effectiveness of a tax on soft drinks in comparison with other practices (Question 26)

Respondents were asked if they believe that other practices such as the reduction of soft drinks' accessibility in public places or the restriction of vending machines are more effective than a tax on soft drinks. According to the answers, the 60% believe so and it is expected as, in a previous question, the 60% of respondents believe either that it is an ineffective measure (37%) or that government will not use the revenue in an appropriate way (23%). More particularly, the 42% (172 people) believe that other practices may be better than the tax and the 18% (75 people) believe that they are surely better. On the contrary, the 32% believe the opposite with the 19% (79 people)

believe that a tax may be better and the 13% (51 people) that the tax is surely better than other practices. There are also a 6% that they did not know what to respond and a 1% that refused to answer.

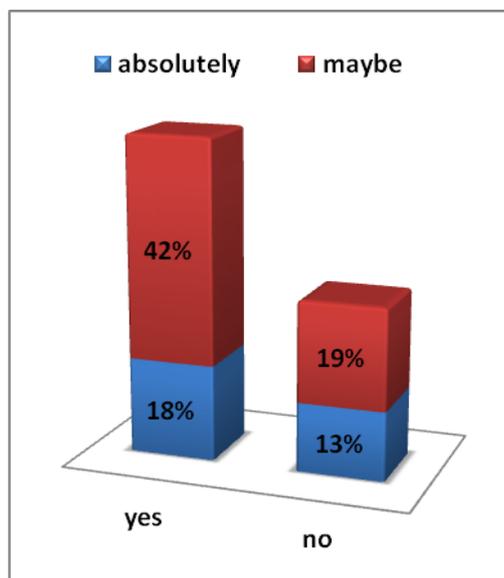


Figure 3.38: Are other practices more effective than a tax

A current investment to promote a healthy diet and encourage greater physical activity and the future cost for medical care (Question 27)

There is nearly unanimous agreement among respondents (85%) that an investment today in order to promote a healthy diet and encourage greater physical activity will reduce the cost for medical care in the future. Specifically, the 43% () strongly believe that and the 42% somewhat believe that. On the contrary, only the 9% are not support this statement with the 6% being somewhat opposed and the 3% being strongly opposed. There are also a 4% that they did not know what to answer and a 1% that refused to answer.

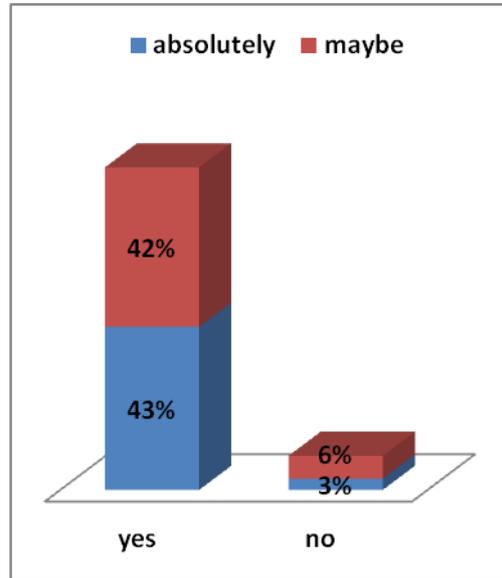


Figure 3.39: Will an investment today to promote a healthy diet and encourage greater physical activity reduce the cost for medical care in the future?

Conclusion

According to respondents' opinion, obesity is a serious problem generally in Greece and more particularly in Greek youths. These findings are in agreement with those of Eurostat as Greece is fifth in both men and women among the Member States of the European Union and second worldwide in Greek adolescents after USA.

As regards the connection between soft drinks and obesity, the great majority of respondents believe that the frequent consumption of soft drinks increases the probability of someone to become overweight or obese and that it may make someone addicted to soft drinks.

The connection between soft drinks and obesity was that which gave the idea for a tax on soft drinks. The most appropriate tax seems to be an excise tax on quantity as it is the quantity that relates to obesity, given that a tax on calories is rather cumbersome.

For an excise tax of 10, 5 or 2 cents per 330ml of soft drinks (the tax increases with the quantity), most of respondents believe that they would not change their soft drinks consumption but they support the taxation. Considering these three taxes, the best one seems to be the tax of 10 cents per 330ml as it has the greatest effect on soft drinks' consumption while most of respondents agree with the imposition of this tax.

For those who are against the tax, the main reason is that they believe that it is not an effective measure and that government would not invest the revenue in the most appropriate way.

Thus, the main conclusion is that a tax on soft drinks could be effective. As it was mentioned, the purpose of a tax on soft drinks is to reduce obesity and earn revenue which will be invested in order to help people have a healthier lifestyle. From the two purposes, it seems that the second one is more likely to be achieved as respondents do not seem to be affected so much by the tax. So, with a tax of 10 cents we can not fight obesity directly, through reduction of soft drinks consumption. But, there is an indirect way to achieve that. Since respondents prefer the highest of the three taxes, and given that consumption will not decrease so much, government could earn high revenue. If the government invests the money in the right way, for example, informing people about the unhealthy products and the consequences of their consumption or offering healthy meals at schools in order to prevent childhood obesity and children to get used to a healthier lifestyle, the reduction of obesity can be achieved too.

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The Questionnaire

1. Which option best describes how often you drink soft drinks?
 - a) I drink soft drinks every day
 - b) I drink soft drinks 2-3 times per week
 - c) I drink soft drinks 2-3 times per month
 - d) I rarely or never drink soft drinks

2. According to your response above, what amount of soft drinks do you consume daily / weekly / monthly?
 - a) 1 glass
 - b) 2-3 glasses
 - c) 4-5 glasses
 - d) More than 5 glasses

3. Which option best describes how often you drink milk?
 - a) I drink milk every day
 - b) I drink milk 2-3 times per week
 - c) I drink milk 2-3 times per month
 - d) I rarely or never drink milk

4. Which option best describes how often you drink 100% fruit juice?
 - a) I drink 100% fruit juice every day
 - b) I drink 100% fruit juice two to three times per week
 - c) I drink 100% fruit juice two to three times per month
 - d) I rarely or never drink 100% fruit juice

5. Do you believe that frequent consumption of soft drinks increases the probability of someone to become overweight or obese?
 - a) Yes
 - b) Maybe yes
 - c) Maybe no
 - d) No
 - e) Don't know

6. On average, would you say that children who live in your house drink less, more or about the same amount of soft drinks as yourself?
 - a) Less
 - b) More
 - c) About the same
 - d) There are no children in the family
 - e) Don't know

7. Do you believe that frequent consumption of soft drinks can cause addiction?
 - a) Yes
 - b) Maybe yes
 - c) Maybe no
 - d) No
 - e) Don't know

- 8.** How serious is the obesity problem in Greek community?
- a) Very serious
 - b) Somewhat serious
 - c) Not too serious
 - d) Not at all serious
 - e) Don't know
- 9.** How serious is the obesity problem among youths in Greek community?
- a) Very serious
 - b) Somewhat serious
 - c) Not too serious
 - d) Not at all serious
 - e) Don't know
- 10.** Comparing today's children with those 10 years ago, do you believe that they are more, less or the same overweight?
- a) More
 - b) Less
 - c) About the same
 - d) Don't know
- 11.** In your opinion, what effect does obesity play, and all the diseases that this entails, in the overall cost of health care?
- a) Very important
 - b) Somewhat important
 - c) Not too important
 - d) Not at all important
 - e) Don't know
- 12.** In your opinion, what effect does obesity play, and all the diseases that this entails, in the amount of taxes you pay?
- a) Very important
 - b) Somewhat important
 - c) Not too important
 - d) Not at all important
 - e) Don't know
- 13.** Do you think the government is doing enough to fight obesity?
- a) Yes
 - b) Maybe yes
 - c) Maybe no
 - d) No
 - e) Don't know
- 14.** Do you believe that the fight against obesity is an issue which can be solved:
- a) By the family
 - b) By the state
 - c) A combination of two but more by the family
 - d) A combination of two but more by the state

- 15.** Which of these statements do you agree with the most?
- a) Childhood obesity is an important issue and we need to invest more in preventing it right now
 - b) Childhood obesity is an important issue, but we should wait until the economy improves before we invest more in preventing it
 - c) We shouldn't invest more in preventing childhood obesity, no matter what happens in the economy
 - d) Don't know
- 16.** Do you believe that a tax on soft drinks will change individual behavior?
- a) Yes
 - b) Maybe yes
 - c) Maybe no
 - d) No
 - e) Don't know
- 17.** If Government passes a law that would tax soft drinks by 10 cents per 330ml would you drink soft drinks more often, less often, or about the same amount as you do now? (the tax depends on quantity. Thus, for 1L the tax is 30,3 cents)
- a) More often
 - b) Less often
 - c) About the same
 - d) Don't know
- 18.** If Government passes a law that would tax soft drinks by 5 cents per 330ml would you drink soft drinks more often, less often, or about the same amount as you do now? (the tax depends on quantity. Thus, for 1L the tax is 15,15 cents)
- a) More often
 - b) Less often
 - c) About the same
 - d) Don't know
- 19.** If Government passes a law that would tax soft drinks by 2 cents per 330ml would you drink soft drinks more often, less often, or about the same amount as you do now? (the tax depends on quantity. Thus, for 1L the tax is 6,06 cents)
- a) More often
 - b) Less often
 - c) About the same
 - d) Don't know
- 20.** If Government passes a law that would tax soft drinks, would you:
- a) Continue to drink soft drinks
 - b) Drink more water
 - c) Drink other substitutes like milk and juices
 - d) No difference, since I don't drink soft drink

- 21.** Would you support a law in Greece that would tax soft drinks by 10 cents per 330ml to fight obesity? (the tax depends on quantity. Thus, for 1L the tax is 30,3 cents)
- a) Strongly support
 - b) Somewhat support
 - c) Somewhat oppose
 - d) Strongly oppose
 - e) Don't know
- 22.** Would you support a law in Greece that would tax soft drinks by 5 cents per 330ml to fight obesity? (the tax depends on quantity. Thus, for 1L the tax is 15,15 cents)
- a) Strongly support
 - b) Somewhat support
 - c) Somewhat oppose
 - d) Strongly oppose
 - e) Don't know
- 23.** Would you support a law in Greece that would tax soft drinks by 2 cents per 330ml to fight obesity? (the tax depends on quantity. Thus, for 1L the tax is 6,06 cents)
- a) Strongly support
 - b) Somewhat support
 - c) Somewhat oppose
 - d) Strongly oppose
 - e) Don't know
- 24.** If you do not agree with a tax on soft drinks, what is the reason?
- a) I do not believe that it is an effective measure
 - b) I do not believe that the government will properly utilize the money
 - c) The government has no right to interfere in our personal lives and regulate what we eat and what we drink
 - d) Taxation in Greece is already very high
 - e) It will hurt the low income people
- 25.** How do you believe that it could be harnessed the amount of tax?
- a) Informing the public (especially in schools) for the risk of unhealthy products and promoting a healthier lifestyle
 - b) Offering healthy foods in schools
 - c) Providing better health services for people with low or middle income
 - d) Enhancing people with low or middle-income to receive more qualitative goods through coupons
 - e) To reduce the government deficit

26. Do you believe that other practices such as the reduction of soft drinks' accessibility in public places or the restriction of vending machines are more effective than a tax on soft drinks?

- a) Yes
- b) Maybe yes
- c) Maybe no
- d) No
- e) Don't know

27. Do you believe that an investment today to promote a healthy diet and encourage greater physical activity will reduce the cost for medical care in the future?

- a) Yes
- b) Maybe yes
- c) Maybe no
- d) No
- e) Don't know

28. Age:

- a) 18-24
- b) 25-34
- c) 35-44
- d) 45-54
- e) 55-64
- f) 65+

29. Gender:

- a) Male
- b) Female

30. Town:

- a) Attica
- b) Thessaloniki
- c) West Macedonia
- d) Central Macedonia (except Thessaloniki)
- e) East Macedonia
- f) Thrace
- g) Thessaly
- h) Epirus
- i) Central Greece
- j) Peloponnese
- k) Crete
- l) Ionian Islands
- m) Aegean Islands

31. Educational level:

- a) Less than high school
- b) High school graduate
- c) College Student
- d) College graduate
- e) Postgraduate degree
- f) Doctoral degree

32. Your income (in euro):

- a) 0-5.000
- b) 5.000-12.000
- c) 12.000-16.000
- d) 16.000-26.000
- e) 26.000-40.000
- f) 40.000-60.000
- g) 60.000-100.000
- h) More than 100.000

33. Your expense is more, less or equal to your income?

- a) More
- b) Less
- c) Equal
- d) Don't know

34. Politics:

- a) Right
- b) Centre-right
- c) Centre
- d) Centre-left
- e) Left
- f) I do not support something specific

35. How many related adults live in your household?

36. How many related children under 18 years of age live in your household?

37. How many related people who live in your household are overweight or obese?

- a) Overweight adults
- b) Overweight children under 18 years of age.....
- c) Obese adults
- d) Obese children under 18 years of age.....