



Istituto Superiore di Sanità



LIFESTYLES AND CANCER PREVENTION

Facts and Figures

September 2014



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About Istituto Superiore di Sanità

The Istituto Superiore di Sanità is the leading technical and scientific body of the Italian National Health Service. Its activities include research, clinical trials, control and training in public health; it also serves as a major national clearing-house for technical and scientific information on public health issues.

The Institute is involved in collaboration and consultation with other institutions responsible for public health, including the Ministry of Health, regional health authorities, local health agencies and hospitals. It cooperates with those responsible for the design and implementation of health and scientific programmes at local and national level and also plays a leading role in several major international research projects.

The Institute provides scientific advice and assessments in the framework of international organizations, such as EFSA, EU, IARC, OECD, UNEP and WHO.



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FOREWORD

Live longer but live better. Years of life gained thanks to advancements in diagnosis and treatment should also be dynamic and sustainable for health systems which, nowadays, bet on efficiency and equity.

Primary prevention, which is mainly a cultural choice, is one of the main tools to obtain concrete and durable results, although not immediate.

The European Union is affected by severe diseases linked to unhealthy lifestyles, which account for much of the incidence of diseases such as cancer, diabetes, cardiovascular diseases, and significantly influence their progression and costs for health care systems.

The economic burden of these diseases is proportional to the increase of treatment options, which reduces mortality but does not always ensure quality of life.

Cancer is the second leading cause of death in Europe and epidemiological evidence collected over the last 30 years shows a correlation with main lifestyle risk factors: tobacco consumption, harmful alcohol use, unhealthy diet, sedentary lifestyle and obesity.

Health, educational, economic and environmental challenges and all related policies are involved in these issues in the quest for a difficult but much needed balance.

OECD analyses show that over 3 million life years free of cancer could be gained within 10 years, and over 10 million within 20 years, through integrated preventive measures to address unhealthy diets, physical inactivity and obesity. Implementing these measures would cost 17 EUR per capita every year, a tiny fraction of what we spend in health care, and would produce significant savings in future health expenditures.



Only if health is kept into account as a driver on all policies will it be possible to achieve this objective and make our lifetime an active lifetime.

We need to change our perspective, to modify our vision. We need to think about education before thinking about medicalization, to take care of our health before having to treat a disease.

Health care is a right for all citizens but to allow access to health care systems, which are becoming more and more expensive due to the escalation of chronic degenerative diseases, we must first and foremost reduce morbidity.

For years, in synergy with WHO, the European Union has been moving in this direction yet much remains to be done. There are still too many differences in the various European Regions, the different EU countries use non-standardized methods to measure lifestyles and there is still a difference in investments in primary prevention.

To promote healthy lifestyle means to promote a “good life” in terms of quality, it means to make the years of our life enjoyable and to ensure equity in access to health care.

An economic, but above all, a human and ethical value.

Walter Ricciardi

Commissioner, Istituto Superiore di Sanità

Section 1.

**LIFESTYLES
AND CANCER**



LIFESTYLES AND CANCER A EUROPEAN AND GLOBAL CHALLENGE

In 2012 there were 14 million new cases of cancer worldwide and 8.2 million people died of this disease.

Over the next 20 years an increase of 22 million cases has been forecasted.

WHO has estimated that one out of three new cases of cancer could be avoided by adopting a healthy lifestyle.

INTERNATIONAL PLANS

Fostering healthy lifestyles is a priority in international strategies to improve health.

- The United Nations and the “25x25” objective

In 2011 The United Nations General Assembly issued a political declaration committing member states to the prevention and control of NCDs. Among the 9 objectives there is the reduction, **within 2025, of 25% of premature deaths due to the four main non-communicable diseases: cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases.** This would mean saving 37 million lives between 2010 and 2025 of which 16 million under the age of 70.

- WHO Global Action Plan for the Prevention and Control of Non-Communicable Diseases 2013-2020. The plan provides all member states and other stakeholders with a roadmap and a set of policy options aimed at implementing concerted and coherent actions to achieve the United Nation’s objectives. WHO issued the warning that the costs of inaction are sig-

nificantly higher than those required to implement the actions for NCDs recommended in the Plan. An estimated investment of 940 million dollars versus 47 billion dollars due to loss in productivity as well as an escalation in costs related to Health Assistance.

- European Union: Third EU Health Programme 2014-2020

Among the main objectives: health promotion, disease prevention, the fostering of supportive environments for healthy lifestyles. The programme will fund projects for an overall 450 million euros over 6 years. Guiding approach: “Health in All Policies”.

LIFESTYLES 2025

Targets

The main non-communicable diseases, including cancer, share 4 behavioural risk factors:

1. tobacco use;
2. unhealthy diet;
3. physical inactivity;
4. harmful use of alcohol.

International plans on lifestyles

- At least a 10% relative reduction in the harmful use of alcohol, as appropriate, within the national context.
- A 10% relative reduction in prevalence of insufficient physical activity.
- A 30% relative reduction in mean population intake of salt/sodium intake.
- A 30% relative reduction in prevalence of current tobacco use in persons aged 15+ years.

- A 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure according to national circumstances.
- Halt the rise in diabetes and obesity.

CANCER IN EUROPE

The four main killers

- Each year in the European Union 2.6 million people develop cancer and 700,000 die of this disease.
- In 2012 in the European Union 1.4 million men and 1.2 million women developed cancer.
- Breast, prostate, colorectal and lung cancer accounted for 50% of cancer incidence.

New cases per year			
Breast cancer 365,000	Prostate cancer 360,000	Colorectal cancer 342,000	Lung cancer 310,000
Number of deaths per year			
Lung cancer 250,000	Colorectal cancer 150,000	Breast cancer 91,000	Prostate cancer 71,000

The most common cancers in Europe

There are striking regional variations in the overall cancer incidence rates, especially between Eastern and Central-Western Europe, with almost a two-fold range in age-adjusted incidence. A substantial proportion of the cancer burden in Europe may be attributed to environmental causes, comprising dietary, social and cultural practices (Figure 1).

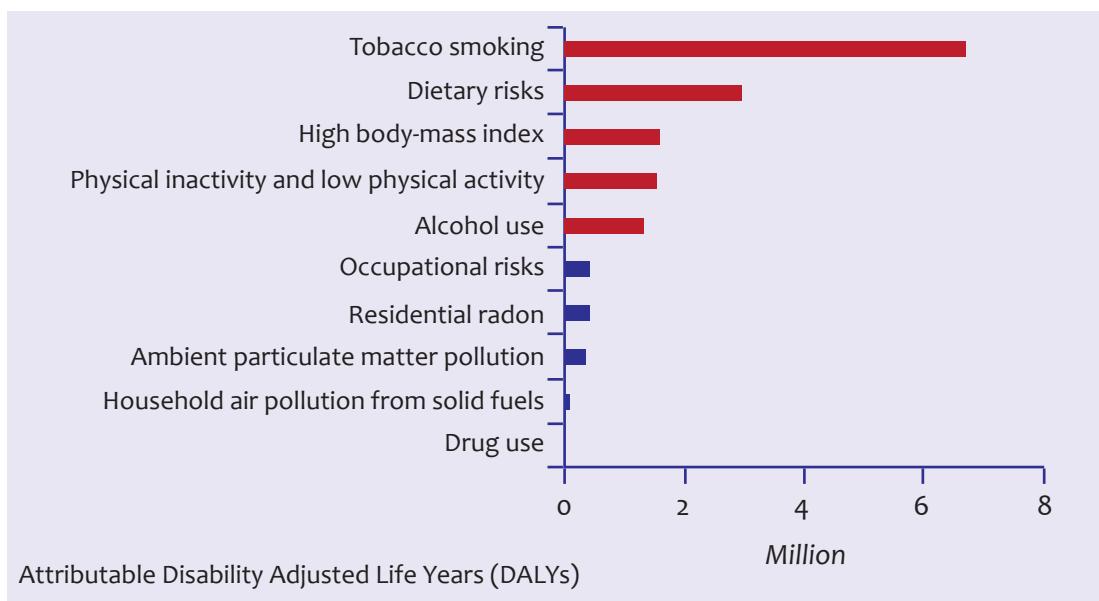


Figure 1 - Contribution of Lifestyle Risk Factors to the Burden of Cancer in Europe

Source: OECD elaboration of IHME Global Burden of Disease Data for EU and EFTA area, 2010

The geographical differences in cancer incidence profile reflect underlying differences in the distribution of the risk factors within each country and the local effectiveness of primary prevention measures (particularly tobacco control). The rates also reflect the availability and effectiveness of organized screening programs (breast, cervical and colorectal cancers). Rapid increases in the incidence of prostate cancer have been observed in countries that have widely adopted the prostate specific antigen (PSA) test as a diagnostic tool.

The most common cancers in Europe are:

- **Breast cancer**

Breast cancer is by far the leading cancer in women by both incidence and mortality. Incidence rates are generally higher in northern and western Europe and relatively low in most eastern countries. **This partly reflects the differing national prevalence of risk factors associated with affluence and socio-economic status including** parity, age at menstruation and menopause, **obesity, tobacco smoking and alcohol consumption.** Some of the differences may be attributable to the time-varying implementation of mammography screening programs within Europe.

- **Lung cancer**

The incidence in men was highest in Central and Eastern European countries, and lowest in the Northern European countries. The reverse was seen in women: elevated rates were estimated in Northern Europe and low rates in Eastern Europe. **These patterns reflect the current phase of the lung cancer epidemic due to past smoking exposure.** Lung cancer is the leading cause of cancer death amongst men in all countries except Sweden, and women die from lung cancer more commonly than from breast cancer in a growing number of countries.

- **Colorectal cancer**

The incidence rates of colorectal cancer are slightly higher in men than in women. Elevated rates of incidence were estimated in Central European countries - Slovakia (92 per 100,000), Hungary (87) and Czech Republic (81) in men, and in Norway (54), Denmark (53) and The Netherlands (50) in women. There is up to a five-fold variation in the incidence

rates across Europe, with the lowest rates in the Balkan countries and Greece. **Life-style factors, such as diet, have a major influence in the causation of colorectal cancers. There are consistent associations with high intake of red and processed meat, high body mass index and obesity, and a sedentary lifestyle. Similarly the protective effect of high levels of vegetables consumption is observed consistently.**

- **Prostate cancer**

Incidence rates of prostate cancer vary by more than 7-fold (25–193 per 100,000) the highest rates were estimated in Northern and Western European countries such as Norway (193) and France (187) and the lowest in Central and Eastern European countries - Republic of Moldova (30) and Albania (25).

The risk of prostate cancer increases with tobacco smoking, alcohol consumption, wrong diet and absence of physical exercises. Moreover the prognosis is negatively affected by overweight.

In comparison with incidence, mortality rates vary much less, from the highest estimated rates in Lithuania (36) or Denmark (34) to the lowest in Malta (14) or Albania (13). This largely reflects the diagnosis of latent cancers in asymptomatic individuals screened by the PSA test. Prostate cancer mortality is less affected by early diagnosis of asymptomatic cancers and a major issue is to what extent early diagnosis produces a real benefit in terms of mortality reduction.

BEST PRACTICES. AN EXAMPLE FROM ITALY

In Italy a set of surveillance systems has been set-up by ISS with the support of the Italian Ministry of Health.

The example of PASSI

To address effective public health policy decisions, the extent of behavioural risk factors and non-communicable diseases (NCDs) in the general population has to be monitored. In Italy a surveillance system that monitors health behaviours and associated risk factors in the population, providing guidance for health promotion and prevention also at local level was instituted in 2007.

PASSI is an ongoing multipurpose community surveillance system in Italy, supported by the Italian Ministry of Health, scientifically coordinated by the National Institute of Health (ISS), and run by the Italian Local Health Units (LHU) and Regional Health Authorities. Telephone-based interviews are performed on a representative sample of non-institutionalized adults aged 18-69 years in all Italian Regions, on a monthly basis, and the system provides prevalence estimates for the main behavioural risk factors for chronic diseases and the adherence to preventive measures, allowing geographic differences and time trends to be evaluated. The characteristics of this system have been widely described elsewhere. In PASSI health and prevention behaviours are investigated: self-perceived health and quality of life, self-reported depressive symptoms, smoking habits and exposure to second-hand smoke, alcohol consumption, diet and nutritional status, physical activity, cardiovascular risk factors, participation in national preventive programmes, i.e. cancer screening and vaccinations, road safety and domestic injuries. Socio-demographic variables are recorded too. Data are encrypted and transmitted via internet to a common national database. No personal identifiers appear in the database. Except for age and sex, derived from LHUs archives, all other data are self-reported and, because of the anonymous nature of data collection, no objective data validation is possible. Data quality is routinely monitored and actions such as analysis, results dissemination and networking are centrally supervised.

**Monitoring frequency
of modifiable
unhealthy lifestyles
is a priority to orient
preventive services**

Section 2.

ALCOHOL



ALCOHOL

Experts have known since 1987 that alcohol can cause cancer, but the connection between the two is often unknown, or ignored.

Research in Europe has shown that 1 in 10 Europeans do not know about the connection, and that 1 in 5 do not believe there is a connection between cancer and the drinks that millions of us enjoy every week.

ALCOHOL IN EUROPE

Alcohol consumption is an important public health problem causing 3.8% of all deaths in Europe and 4.6% of all Disability Adjusted Life Years (DALYs). The European Union is the Region with the highest level of alcohol consumption worldwide: 11 litres of pure alcohol per adult per year (Figure 2).

Harmful use of alcohol is broad and encompasses the drinking that causes detrimental health and social consequences for: the drinker; the people around the drinker and society at large, as well as the patterns of drinking that are associated with increased risk of adverse health outcomes.

Alcohol ranks third amongst risk factors preceded only by tobacco and hypertension.

In the EU alone it is responsible for 12,000 premature deaths per year: 1 out of 7 men and 1 out of 13 women; 6.5% of deaths is caused by alcohol-related chronic diseases.

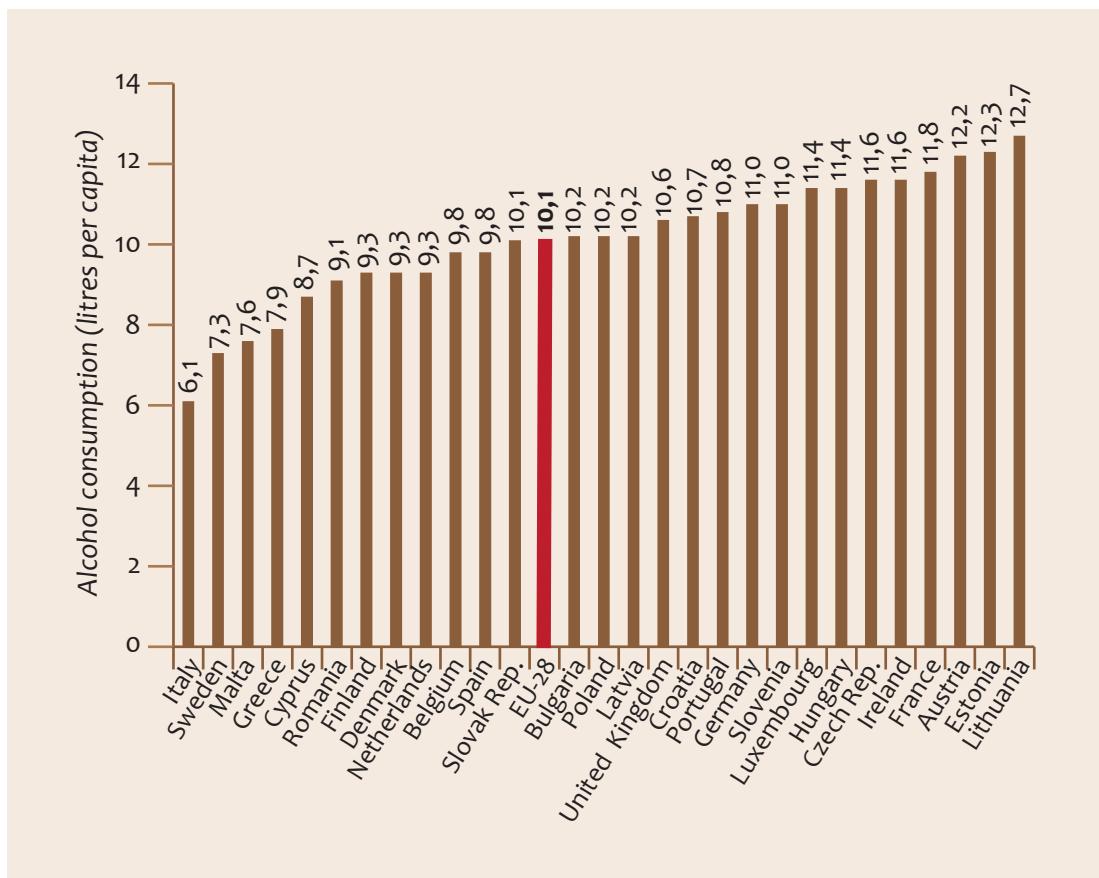


Figure 2 - Alcohol consumption (litres per capita)

Source: OECD Health Statistics 2014 completed with Eurostat Database (EHIS) and WHO European Health for All Database.

ALCOHOL AND CANCER

For the past thirty years experts have agreed on the relationship between Alcohol and Cancer and Alcohol has been declared carcinogenic.

There is sufficient evidence in humans for the carcinogenicity of alcohol consumption. Alcohol consumption causes cancers of the oral cavity, pharynx, larynx, oesophagus, colon-rectum, liver (hepatocellular carcinoma) and female breast. Also, an association has been observed between alcohol consumption and cancer of the pancreas.

Synergistic effects of alcoholic beverages and tobacco have been found, especially for oropharyngeal and esophageal cancers.

IARC E 100 a review of human carcinogens, 2012

- Ethanol causes cancer through the production of acetaldehyde, a toxic metabolite involved in the development of the main cancers of the esophagus and intestinal tract.
- Acetaldehyde is a mutagen and carcinogen, it binds to DNA and increases the risk of DNA mutation and replication of impaired cells.
- Moreover, alcohol, can interfere with the action of hormones and increase the risk of liver and breast cancer.

EUROPEAN STATISTICS

The European Prospective Investigation into Cancer and Nutrition (EPIC) study is one of the largest cohort studies in the world, with more than half a million (521,000) participants recruited across 10 European countries and followed for almost 15 years. This study has shown that:

- 1 out of 10 cases of cancer in men and 1 out of 33 cases in women are the result of alcohol consumption;
- 10% of all oral cavity, pharyngeal, laryngeal, esophageal, colorectal, pancreatic and liver cancers reported among males and 3% of all those reported among females are alcohol related;
- 32% of alcohol related cancers in men and 7% in women were attributable to alcohol consumption of more than 24 grams per day for men and 12 grams per day for women;
- the economic impact is also remarkable: costs related to alcohol consumption in medium and high income countries account for over 1% of GDP.

EUROPEAN POLICIES TO REDUCE THE HARMFUL USE OF ALCOHOL

In 1979, the World Health Assembly called upon WHO member states to develop and adopt appropriate legislation and measures to tackle alcohol misuse (WHO, 1979). Such efforts culminated with the endorsement, in 2010, of the global strategy on the harmful use of alcohol that supports ten target areas for national actions including:

- health sector response;
 - community actions;
 - drink-driving policies;
 - limitation of the availability of alcohol;
 - marketing restrictions and price policies;
 - reducing the negative consequences of intoxication;
 - reducing the public health effect of illegally and informally produced alcohol;
 - monitoring and surveillance of the impacts of the above policies.
-

Policy makers and researchers alike agree that tackling harmful drinking requires a range of policies from the different areas identified in the Global Strategy.

In 1992, the European Region was the first WHO region to adopt a plan to reduce the use of alcohol and, despite a large number of initiatives, more remains to be done.

In 2009, 4 out of 10 countries had no written national policy on alcohol:

- 6 out of 10 countries had produced monitoring reports but on a range of non-standardized indicators;
- in one third of member states alcohol may be sold to adolescents under the age of 18.

The price of alcohol has remained the same or has decreased in over half of the countries in the last five years (*European status report on alcohol and health*, 2010. Copenhagen, WHO Regional Office for Europe).

In 2011, 53 Member states of the WHO Regional Committee for Europe approved a new action plan to reduce the harmful use of alcohol.

The plan is closely linked to the Action Plan for implementation of the European Strategy for the Prevention and Control of Non-Communicable Diseases and it is based on the following 5 main objectives:

- raise awareness of the magnitude and nature of the health, social and economic burdens of the harmful use of alcohol;
- strengthen and disseminate the knowledge base;
- enhance the capacity to manage and treat alcohol use disorders;
- increase mobilization of resources required for concerted action to reduce the harmful use of alcohol;
- improve systems for monitoring and surveillance.

Global, regional and national actions on:

- levels of alcohol consumption;
- patterns of alcohol consumption;
- contexts of alcohol consumption;
- wider social determinants of health.

Special attention needs to be paid to reducing harm to people other than the drinker and to populations that are at particular risk from harmful use of alcohol (Figure 3).



Figure 3 - Alcohol policy change in 30 European countries

From WHO (Mr Dag Rekke Department of Mental Health and Substance Abuse, WHO Headquarters) at APD, Rome 2014

Section 3.

TOBACCO



TOBACCO

Tobacco consumption is the single largest cause of cancer in the world.

- Smoking is the leading cause of preventable death in the world.
- About six million people are killed each year from tobacco-related diseases: one every six seconds.
- 600,000 victims of second-hand smoking.
- 8,000,000 a year is the number of victims expected by 2030.
- 700,000 victims each year only in the EU.

TOBACCO IN EUROPE

The most recent European survey on tobacco use (2012) carried out in the 27 Member States of the European Union has provided the following outline on the prevalence of smoking.

In Europe:

- 28% are smokers;
- 21% are ex-smokers;
- 51% have never smoked.

The age group with the most smokers is 25 to 39 years (37% of respondents), the one with the least is the over 55 age group (17%). One out of four youngsters between 15 and 24 years are smokers (Figure 4).

(Source: Eurobarometer, 2012).

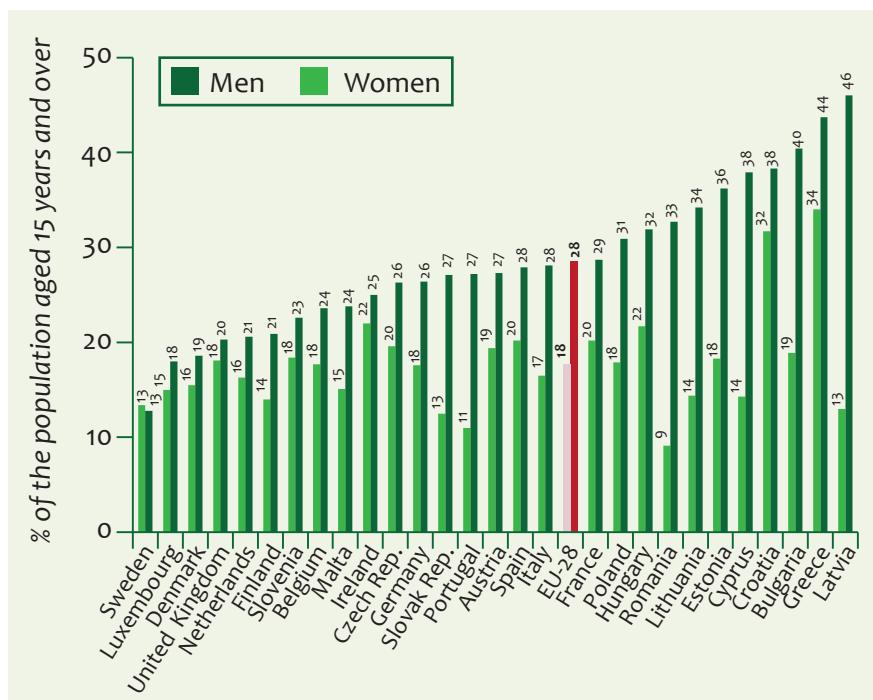


Figure 4 - Smoking rate by gender 2012 or nearest year

Source: OECD Health Statistics 2014 completed with Eurostat Database (EHIS) and WHO European Health for All Database.

SMOKING AND CANCER

- One out of four (26%) of all cancer deaths are caused by smoking, which is also responsible for 85% of lung cancer deaths across the EU.
- 90-95% of lung cancers are due to tobacco smoke.

In addition to lung cancer, smoking tobacco causes mouth cancer, bladder (the latter is in fact exposed to toxic substances eliminated through the urine) and stomach cancer. In addition, smoking is associated with an increased risk of melanoma and pancreatic cancer and a worse prognosis of diseases that have arisen.

Harms of second-hand smoking

- Over 50 carcinogens contained in tobacco smoke.
- 40% of children in the world, 33% of non-smoking men, 35% of female non-smokers are exposed to second-hand smoke.

Children are more heavily exposed to second-hand smoke of adults because they cannot avoid the main source of exposure represented by their parents and relatives who smoke at home.

POLICIES FOR SMOKING PREVENTION

The WHO Framework Convention on Tobacco Control (WHO FCTC) is the first treaty negotiated under the auspices of the World Health Organization. It came into force in 2005, and includes both demand-side and supply-side provisions for the reduction of tobacco smoking (Figure 5).

The core measures include the following:

- price and tax measures to reduce the demand for tobacco;
- protection from exposure to tobacco smoke;
- regulation of the contents of tobacco products;
- regulation of tobacco product disclosures;
- packaging and labelling of tobacco products;

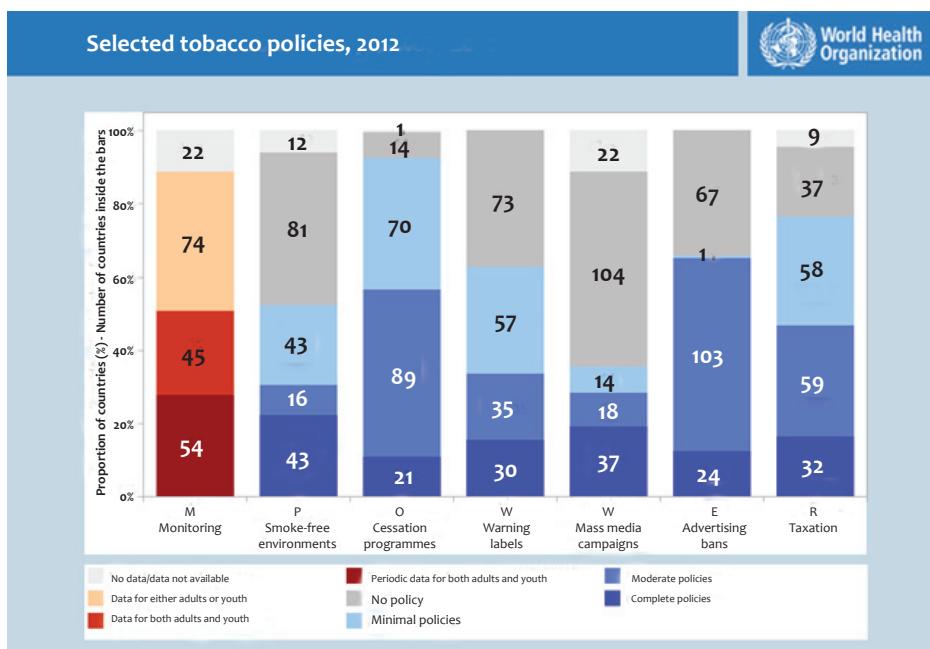


Figure 5 - Selected tobacco control policies, 2012

- education, communication, training and raising public awareness;
- restrictions in tobacco advertising, promotion and sponsorship;
- demand reduction measures concerning tobacco dependence and cessation;
- measures to counter Illicit trade in tobacco products;
- measures to counter sales to and by minors;
- provision of support for economically viable alternative activities.

All EU countries are signatories to the WHO FCTC, and all have implemented its provisions into their national legislation.

120 countries have taken measures to protect citizens from second-hand smoke, in 93 cases with rules included in the national legislation.

Over the past 20 years, several countries, including Italy, have passed legislation aimed at protecting the health of non-smokers by banning smoking in public areas, such as bars, cinemas, restaurants, hotels and workplaces.

European Union recommendation

Even the European Union with the recommendation of 30 November 2009 on smoke-free environments (2009/C 296/02) has asked Member States to commit to “provide effective protection from exposure to second-hand tobacco smoke in workplaces, public areas, on public transport and where appropriate in other public places”.

However, still only a minority of states have extended the prohibition to all major places open to the public, for example by exempting bars and restaurants or private offices, and even fewer are those that adopt effective sanctions to enforce the prohibitions.

Revision of the Directive on Tobacco Products

In December 2012, the European Commission has proposed new rules for tobacco products as a result of a public consultation that he has collected 85,000 responses at all levels of society. The proposals, which aim to update the legislation on tobacco and make smoking less attractive to young people, involve the production, presentation and marketing of tobacco products.

The proposed measures should help to reduce tobacco consumption by 2% in five years, and respond to international commitments, such as the WHO Framework Convention on Tobacco Control.

THE INTERNATIONAL MARKET

The world market for cigarettes, has increased by 100 times in 100 years: in 2009, 5.9 trillion cigarettes were consumed worldwide, but distribution is uneven with the highest values in Russia and other Eastern European countries, China and other countries in the Far East.

In the European Union in 2012:

- 593 billion cigarettes were consumed (-5.7% compared to 2005);
- higher consumption in Germany (103 billion) and Italy (86 billion);

Smoking rates, for EU countries are shown in Figure 4 (page 22).

BEST PRACTICES. AN EXAMPLE FROM ITALY

A tool to help quit smoking: lung cancer risk assessment tool

The choice to quit smoking can be triggered also at individual level by the awareness of the risk of developing lung cancer. To this purpose ISS developed a tool to be used by GPs to compute the risk of lung cancer associated to modifiable factors for each patient cared for. The risk of disease can be evaluated according to age, for tobacco smoking and other variables related to environmental conditions: occupational exposure to dust, chemical substances, gas and proximity of the dwelling to sources of air pollution. The risk assessment can be extrapolated from a series of colorimetric tables broken down by sex, age and smoking habits (non-smokers, ex-smokers, smokers. The absolute risk (probability of developing lung cancer by age group) and the relative risk (risk ratio between the risk of a person exposed to the risk factor and that of a not exposed person of the same sex and age).

***Awareness
of the risk
may help quit
smoking***

The battle against second-hand smoking in Italy

With the Law 3/2003 Italy, was at the forefront in Europe for the protection of non-smokers. With this legislation the ban on indoors smoking has been extended to all areas open to the public making Italy the first country in the world to introduce a ban on smoking in public areas. It was possible to extensively evaluate the effects of the ban, as far as health impacts are concerned: in fact, a 17% reduction in acute coronary syndromes in non-smokers was observed. From 2008 to 2013, compliance with the ban on smoking in public places and the workplace significantly and consistently increased in all areas of the country: the frequency of those reporting full compliance with the ban on smoking in public places has increased from 87% to 91%, the frequency of those who report compliance with the ban on smoking in the workplace increased from 87% to 92%. Since the introduction of the Law, there was also a change in the habit of smoking in private homes: from 2008 to 2013 the rate of those who declared their homes smoke-free increased significantly from 71% to 80%.

***The ban on smoking
in public areas
has produced
positive
health effects***

Section 4.

**NUTRITION,
PHYSICAL ACTIVITY, OBESITY**



NUTRITION, PHYSICAL ACTIVITY, OBESITY AND HEALTH IN NUMBERS

About 2.8 million deaths a year in the EU are due to causes associated with overweight and obesity (WHO *European Health Report 2012*).

It is estimated that around 1 million deaths are attributable to physical inactivity.

In Europe:

- 25-70% of adults are overweight, depending on the country;
- 5-30% are obese;
- 41% do not engage in any physical activity in a typical week.

Based on the latest estimates in European Union countries, overweight affects 30-70% and obesity affects 10-30% of adults (WHO).

In 2008, around 35% of people aged 15 and over in the WHO European Region were insufficiently active (WHO European Childhood Obesity Surveillance Initiative, COSI).

In Europe one 11 year old boy out of 3 is obese or overweight:

- the level of physical inactivity of Europeans is worrisome;
- 4 out of 10 adults aged 15 years old and over are not physically active;
- only 22% of 11-year-old girls and 30% of 11-year-old boys report engaging in moderate to vigorous physical activity for at least 60 minutes per day.

(Source: *Eurobarometer*).

INTAKE OF FRUIT AND VEGETABLES IN EUROPE

Insufficient intake of fruit and vegetables in Europe causes:

- 16 million years of disability-adjusted life;
- 1.7 million deaths.

(Source: WHO, *Promoting fruit and vegetable consumption around the world*).

WHO has estimated that insufficient intake of fruit and vegetables causes approximately 14% of deaths from gastrointestinal tumors (World Health Organization, 2009. Global Health Risks Summary Tables. WHO: Geneva, Switzerland).

WHO estimates that in more than half of the countries of the European Region, the consumption of fruit and vegetables is less than 400 grams per day, and in a third of the countries, the average consumption is less than 300 grams per day (*Comparative analysis of nutrition policies in the WHO European Region*. WHO: Copenhagen, Denmark. European Food Safety Authority, 2010).

Consumption reaches the recommended amount in only 4 EU Member States (Poland, Germany, Italy and Austria) (*European Nutrition and Health Report*, 2009).

The average intake of vegetables (including legumes and nuts) in Europe is 220 grams per day, the consumption of fruit is on average 166 grams per day (European Food Safety Authority, 2008. *Concise Database summary statistics - Total population*).

Children's intake of fruit and vegetables is related to their parents consumption.

The average amount of meat typically consumed in Italy (about 90 kg per year) and in Europe are not considered healthy (Eurostat, *Consumption of certain foodstuffs per inhabitant, 2000-2010*).

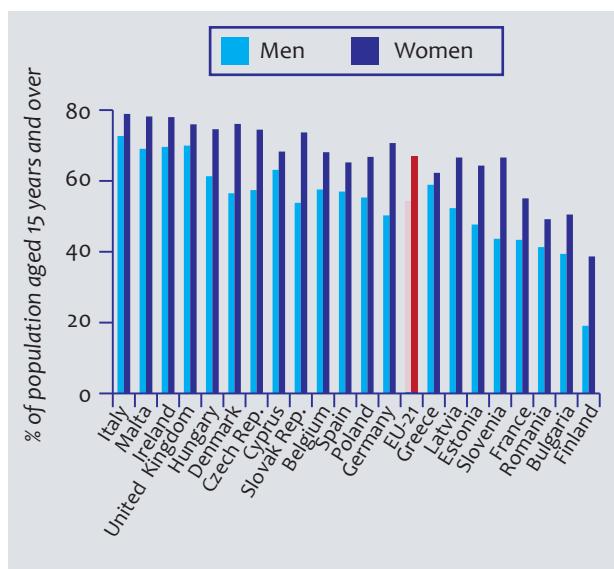


Figure 6 - Daily fruit eating among adults 2012 (or nearest year)

Source: OECD Health Statistics 2014 and Eurostat Statistics Database for non-OECD countries

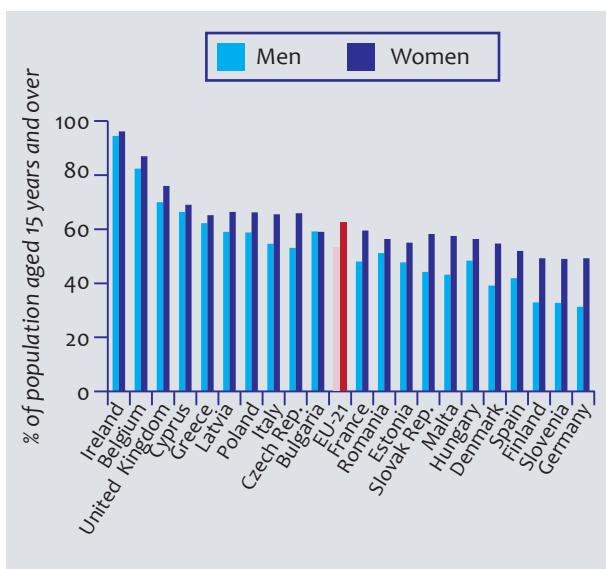


Figure 7 - Daily vegetable eating among adults 2012 (or nearest year)

The European EPIC study showed that:

- A proper diet may lower the risk of cancer of the digestive system by 30%.
- Engaging in physical activity may lower the risk of colon cancer by 20%.
- Engaging in physical activity may lower the risk of breast cancer by 30% but the risk instead increases in the presence of obesity in menopause.

OBESITY IN EUROPE

The probability of becoming obese is greatest among people with a low income or low level of education and, in particular, the data reveal that women with a low level of education are two to three times more likely to become overweight compared to the better educated (Figure 8). Even the family can influence the development of obesity:

- lifespan of an obese person is 8-10 years shorter;
- the probability that women with a low level of education become obese is two to three times higher (in men this difference is less noticeable);



Figure 8 - Prevalence of obesity among adults, 2002 and 2012 (or nearest year)

Source: OECD Health Statistics 2014 completed with Eurostat Statistics Database.

- a child with obese parents is 3 or 4 times more likely to be overweight or obese (due both to a genetic cause and the negative example of parents with unhealthy lifestyles). (Source: Report OECD Obesity and economics of prevention fit non fat, 2010).

CANCER, PHYSICAL ACTIVITY, OBESITY AND NUTRITION

According to a report by the World Cancer Research Fund and American Institute for Cancer Research (Figure 9):

- since the early 1980s United Nations agencies, national governments, authoritative non-governmental organisation, researchers and other experts in the field have agreed that food and nutrition, physical activity and body composition are individually and collectively important modifiers of the risk of cancer, and taken together may be at least as important as tobacco.
- Improved diet, along with maintenance of physical activity and appropriate body mass, could reduce cancer incidence by 30–40% over time.
- Cancer kills about 1 million adults each year in the WHO European Region and inappropriate diet causes about one third of all cancer deaths worldwide.
- 30–40% of all cases of cancer is estimated to be causally related to nutritional factors. The scientific evidence suggests that diet is most convincingly linked to cancers of the lung, stomach, colon/rectum, nasopharynx, oesophagus, mouth and pharynx. A link to cancer of the breast is probable, and diet is possibly associated with cancer of the liver and cervix (World Cancer Research Fund & American Institute for Cancer Research. *Food, nutrition and the prevention of cancer: a global perspective*).

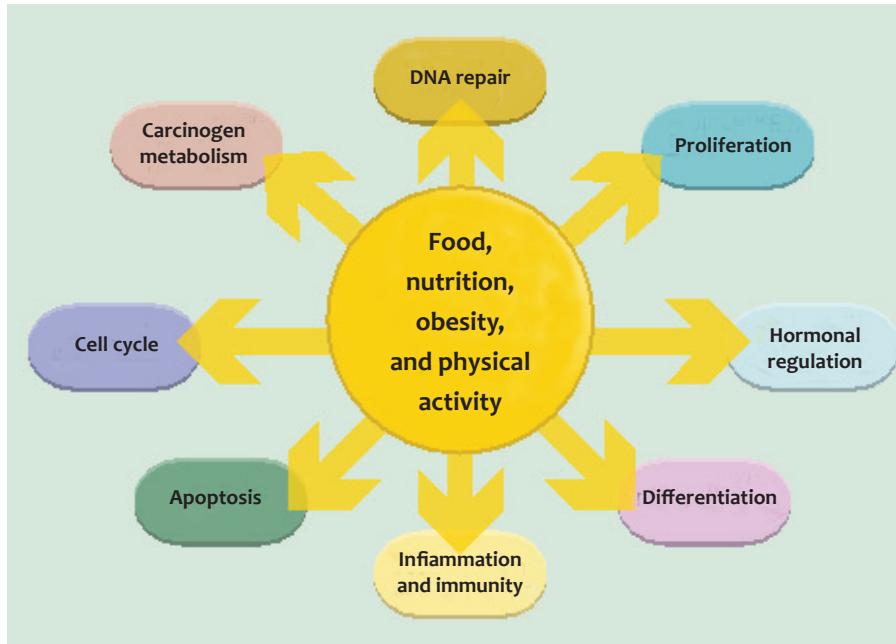


Figure 9 - Food, nutrition, obesity, and physical activity can influence fundamental processes shown here, which may promote or inhibit cancer development and progression

Source: World Cancer Research Fund & American Institute for Cancer Research

In particular:

A raised Body Mass Index (BMI) also increases the risk of cancer of the breast, colon/rectum, endometrium, kidney, oesophagus (Adenocarcinoma) and pancreas. Mortality rates increase with increasing degrees of overweight, as measured by BMI. To achieve optimal health, the

median BMI for adult populations should be in the range of 21 to 23 kg/m², while the goal for individuals should be to maintain a BMI in the range of 18.5 to 24.9 kg/m².

(WHO, Global Status Report on non-communicable diseases, 2010).

EUROPEAN POLICIES FOR NUTRITION AND THE REDUCTION OF OBESITY

WHO European Action Plan for Food and Nutrition Policy 2007-2012

Four main health challenges:

- diet-related NCDs;
- obesity in children and adolescents;
- micronutrient deficiencies;
- foodborne diseases.

Six priority actions are recommended:

1. supporting a healthy start - dealing with infant and young child nutrition;
2. ensuring safe, healthy and sustainable food supply;
3. providing comprehensive information and education to consumers;
4. implementing integrated actions to promote physical activity, control alcohol, ensure a safe water supply;
5. strengthening nutrition and food safety in the health sector; and
6. monitoring and evaluation.

About dietary guidelines these are the main WHO's recommendations:

- daily needs of energy, vitamins and minerals are met, but energy intake is not excessive;
- consumption of fruit and vegetables is over 400 g per day;

- intake of saturated fat is less than 10% of total energy intake;
- intake of trans fatty acids is less than 1% of total fat intake;
- intake of free sugars is less than 10% of total energy intake or, preferably, less than 5%;
- intake of salt is less than 5 g per day.

Childhood obesity: European Action Plan 2014-2020

- Support a healthy start in life.
- Promote healthy environments (especially in schools and pre-schools);
- Make the healthy choice the easier choice;
- Restrict marketing and advertising to children;
- Inform and empower families;
- Encourage physical activity;
- Monitor and evaluate obesity;
- Increase research.

Global recommendations on physical activity for Health, WHO 2010

These recommendations are focused on primary prevention of non-communicable diseases through physical activity and suggest different policy options for reaching recommended levels of physical activities worldwide:

- elaboration and implementation of national guidelines for physical activity aimed at improving health;
- inclusion of physical activity promotion into policies of other physical activity-related fields, with the aim of developing coherent and complementary policies and action plans;

- use of mass media to raise awareness of the benefits of physical activity;
- surveillance and monitoring of interventions for promoting physical activity.

For healthy adults aged 18-65 years WHO recommends at least 30 minutes of moderate-intensity physical activity five days a week or at least 20 minutes of vigorous-intensity physical activity three days a week.

Overall, adults over the age of 65 should reach the same physical activity goals as healthy adults in the lower age group, in order to increase muscle strength and balance, which help prevent falls.

Section 5.

**ECONOMIC IMPACTS
AND PREVENTION POLICIES**



THE HEALTH AND ECONOMIC IMPACTS OF PREVENTION POLICIES

POLICIES TO IMPROVE DIETS, INCREASE PHYSICAL ACTIVITY AND PREVENT OBESITY

Mass media campaigns have been shown to have a positive, moderate effect on the increase of physical activity in targeted populations with a good cost-effectiveness ratio. **Counselling in primary care** to encourage physical activity and dietary improvements, despite the higher cost, has been shown to be an effective and cost-effective policy. Some **school-based programmes** that combine actions on physical activity and diet are more efficient than interventions in a single domain. **Community-based interventions** focussing on walking in particular (using pedometers) have been shown to be effective as well as cost-effective in the short term (Figure 10).

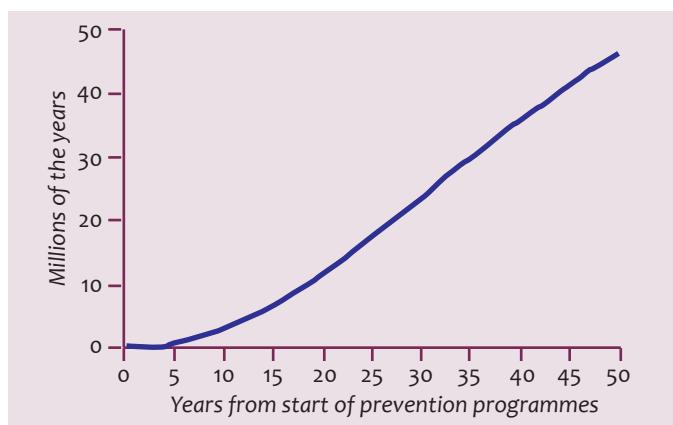


Figure 10 - Years of Life Free of Cancer Gained through Prevention

Source: Analysis based on OECD Chronic Disease Prevention (CDP) model. It includes colorectal, lung and female breast cancer

OECD analyses indicate that **taxes on foods and beverages** high in sugar, fat and salt are generally cost saving, and have a favourable health impact at the population level, but require a careful design to prevent unintended consequences. Both the effectiveness and distributional impacts of taxes appear to be enhanced by coupling them with subsidies targeting healthy foods or disadvantaged consumers. **Making fruit and vegetables more available** in schools was found to have positive though modest effects on dietary intake, and is cost-effective. **Product reformulation** to decrease the use of potentially unhealthy ingredients is possible, as salt-reduction programmes have shown, and cost-effective, but the economic evidence on other efforts (e.g. to reduce transfat content) is very limited. **Mandatory food labelling** schemes are cost-effective, but the evidence is more mixed on information campaigns.

- A comprehensive prevention strategy including regulatory actions on food labelling and advertising to children, health promotion programmes at schools and workplaces, and counselling of people at risk in primary care, would avoid 70 000 and 75 000 deaths from chronic diseases every year, respectively, in England and Italy.
- The annual cost of such strategy would be around 12 GBP (15 EUR) per capita in England and 17 EUR in Italy. The cost per life year gained through this prevention strategy is less than 15 000 EUR (12 000 GBP) in these two countries.
- A comprehensive strategy to address unhealthy diets, physical inactivity and obesity would lead to gains of over 3 million life years free of cancer in Europe within 10 years, and over 10 million within 20 years.

POLICIES TO TACKLE THE HARMFUL USE OF ALCOHOL

Alcohol policies have a great potential to curb alcohol-related harms, improve health, increase productivity, reduce crime and violence, and cut government expenditure. OECD analyses show that the largest health gains can be obtained through **brief interventions in primary care**, typically targeting high-risk drinkers, and **tax increases**, which affect all drinkers. Ranking in a second tier, for health impacts, are **regulation and enforcement policies** as well as other health care interventions, while the evidence on **school-based programmes** is more mixed. Hundreds of thousands of working-age people would be freed of alcohol-related disabilities and would not incur injuries, with major potential gains in their productivity. Most alcohol policies are estimated to cut health care expenditures to the extent that their implementation costs would be more than offset. Health care interventions and enforcement of drink-drive restrictions are more expensive policies, but they still have very favourable cost-effectiveness profiles.

- Policies to increase the prices of alcoholic drinks, regulation and enforcement policies, education programmes and health care interventions are all effective and efficient means to curb alcohol-related harms and improve population health.
- If offered systematically in primary care settings, brief interventions have the potential to generate large health and life expectancy gains; a tax hike leading to an average increase of 10% in alcohol prices would also generate very large impacts.
- Combining alcohol policies in a coherent prevention strategy would significantly increase impacts, helping to reach a “critical mass” with greater impact on the social norms that drive drinking behaviours.

- A package of fiscal and regulatory measures, one of health care interventions, and a mixed strategy would each achieve gains of, for instance, 23-29 thousand disability-adjusted life years (DALYs) in the Czech Republic and 119-137 thousand DALYs in Germany.
- Alcohol strategies combining multiple policies would yield yearly savings in health expenditures of up to 8 and 6 USD PPPs per person, respectively, in the above two countries.
- Policies delivered in health care settings are the most expensive to implement, followed by the enforcement of drink-drive restrictions and workplace programmes. Price and regulatory policies are substantially less expensive.
- Savings in health care expenditure would be large enough to finance the implementation of several of the policies examined, but even the most expensive alcohol policies have favourable cost-effectiveness profiles.
- In Europe, as many as 3%-5% of working-age men would be freed of alcohol-related disabilities each year if brief interventions were systematically offered in primary care settings. Lesser, but still substantial gains can be made with other alcohol policies.

POLICIES TO CURB TOBACCO SMOKING

Evidence-based tobacco control policies are shown to be highly cost-effective and many are cost-saving, as shown in a joint review of the OECD and the European Observatory on Health Systems and Policies. Price is a major factor determining use and the prices of the “cheapest cigarettes” vary twentyfold between countries, while prices of the “most sold cigarettes” vary ninefold. Each 10% difference in price is associated with a 2.5–5% difference in cigarette consumption in the opposite direction, and price differences account for much of the three-

fold difference in smoking rates between European countries, which are highest in countries where prices are lowest, among lower socioeconomic groups, the unemployed and lone parents. They are a major cause of inequalities in health and mortality.

- The most cost-effective single tobacco control policy has been identified as **raising taxes**. Raising cigarette prices across Europe to the EU average of around 4.25 EUR would save hundreds of thousands of lives each year.
- The most cost-effective health care intervention to tackle smoking is **brief opportunistic advice** from a general practitioner along with telephone or self-help material.
- Pregnant women are a particularly important group in which low-cost smoking cessation interventions costing in the range of 20-50 EUR would be cost saving.
- Other actions, such as **warning labels** and **advertising bans**, often generate savings in health care expenditures which offset implementation costs. An OECD study of 22 countries reported a significant effect of different levels of advertising restriction, scored from 1 to 10, with each point associated with a 1.5% decrease in consumption. An advertising ban in Finland was estimated to have reduced consumption by 7%.
- **Smoking bans in public places** have the potential to increase smoking cessation, accelerate declines in smoking rates and reduce second-hand smoking. Smoking bans have been shown to be cost-effective in many settings.
- The most effective means of reducing youth smoking is to reduce adult smoking via price increases, smoke-free policies, and good and well-designed multimedia programmes.

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