



World Health
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High blood pressure - country experiences and effective interventions utilized across the European Region



CONTROL YOUR BLOOD PRESSURE
CUT YOUR RISK OF HEART ATTACK AND STROKE



World Health Day 2013



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Keywords

Blood pressure
Chronic Diseases and their Control
Health policy
Health promotion
Hypertension
Risk factors

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Executive Summary

High blood pressure has serious health implications for society as it is a major risk factor for serious cardiovascular events. In the European Region these issues are particularly relevant as the increasing prevalence and incidence of the diseases caused by high blood pressure are evident via both morbidity and mortality rates. Nevertheless, there are clear examples where Member States have implemented interventions, and have been successful in improving public health and reducing blood pressure. Some of the key characteristics of successful interventions which policy-makers should be aware of are summarized below:

1. Develop policy based around three pillars:
 - Create a monitoring system for salt consumption, which is related to noncommunicable diseases, in order to monitor population salt consumption;
 - Create a reformulation strategy that enables dialogue and platforms for discussion so that food industry, retail and catering salt targets can be established and collaboration between the stakeholders and government can be enabled; and
 - Improved population awareness – education needs to be more sophisticated in a way that evolves from simple, inefficient campaigns to comprehensive, effective behaviour change approaches namely based on primary care.
2. Note that small changes in diet have proven effective in creating substantial health changes. Policy should be used to get rid of trans fats, especially through ensuring that industries are pushed to reformulate their products in order to eliminate trans fats without increasing saturated fats. Combining these changes with salt reduction can have a huge impact on blood pressure related events and mortality rates.
3. Comprehend that increasing tobacco product taxes with simultaneous, and alternative, intervention implementation is the most successful method for reducing population consumption of tobacco. Further, following the provisions of the WHO Framework Convention on Tobacco Control (FCTC) is strongly suggested. The Framework illustrates that utilizing health warnings on tobacco packages (combining text and pictures) is one of the most cost-effective measures that can be implemented to improve public knowledge and decrease tobacco consumption. (1) Further, consumption should be banned in public places, and advertising should be controlled, if not banned.
4. Policymakers should seek to implement the “best buys” through addressing three areas proven to have a positive impact on alcohol consumption: marketing (advertising), availability (retail), and best prices (taxation). Additionally, interventions should target young people in order to impact future lifestyle habits.
5. Assess their local health system model to gauge the blood pressure screening and prevention measures. By incorporating simple screening methods at every medical appointment, issues can be identified and addressed early-on to prevent later-in-life development of high blood pressure.
6. Understand the value in ‘thinking outside the box’ for creative ways to promote mobility within society and to make changing modes of transportation a possibility.

7. Alter opt-in systems for healthier defaults – policymakers can assess current programs and policies to make adjustments where negative choices are the initial default. Policies can be made or altered to support relevant stakeholders in the change to a pro-health nudging and regulating system.
8. Create well-targeted communication campaigns to create awareness that:
 - Informs the entire population about the risk factors;
 - Enable politicians to translate information into effective policy;
 - Facilitates population acceptance of policy changes through behavioural and environmental changes.

While many of these interventions are cost-efficient and applicable across the entire European Region, it is important that every country and community understand local needs, and find suitable solutions. These interventions should provide a starting point – a point of inspiration – for which policy-makers realize that preventing high blood pressure and heart disease is possible through a set of tangible interventions. Strong guidance is required from political heads in order to impact the morbidity and mortality rates associated with high blood pressure – and with noncommunicable diseases as a whole. (2)

This background paper outlines the factors associated with blood pressure, details the relationship between risk factors and blood pressure, depicts the related situation in the European Region, and highlights what certain countries of the European Region have done to successfully and effectively address these issues. Most importantly, this paper illustrates that simple, but focused, cost-effective interventions can have a significant impact on prevention and reduction of high blood pressure and the diseases it causes.

1.0 Background

It is well known that high blood pressure can lead to hypertension which is a major risk factor for overall mortality on a global scale. By changing the structure of arteries, high (also known as raised or elevated) blood pressure increases the risk of stroke, heart disease, and kidney failure, as well as other diseases. In 2009, the World Health Organization (WHO) attributed 13% of all deaths globally to high blood pressure making it an area of prime importance for public health in both developing and developed nations. (3)

According to *The Action Plan for implementation of the European Strategy for the Prevention of Noncommunicable Diseases 2012-2016*, noncommunicable diseases (NCDs) are responsible for 86% of all deaths and 77% of the disease burden in the European Region. This is especially important in an ageing society where NCDs are the leading cause of death and ill health – and this primarily includes conditions caused by high blood pressure. (4) Globally, cardiovascular diseases comprised 48% of all NCD-related deaths in 2008. (5) Further, *The Health 2020 Policy* has made it a priority to tackle the European Region's major contributors of disease, thus making reducing high blood pressure prevalence a priority. (6)

Within Europe, high blood pressure is particularly an issue as it has been shown to have an increased prevalence of 60% when compared with the U.S. and Canada – two prominent non-European developed countries. (7) In addition, it directly causes approximately 25% of heart attacks in Europe. In its progressed form of cardiovascular disease, it is estimated to cause 42% of all deaths across the European Region annually. (8)

2.0 Goals and the Action Plan for the prevention of high blood pressure

The Action Plan for implementation of the European Strategy for the Prevention of Noncommunicable Diseases 2012-2016 reports that hypertension places increased strain on health care systems by negatively affecting economic development and effecting the health of many Europeans – particularly the elderly population. (4) High blood pressure is preventable, and is directly related to lifestyle habits such as poor diet, low levels of physical activity, and tobacco and alcohol consumption. These behavioural risk factors are responsible for about 80% of serious heart conditions. (9)

To address this issue of high blood pressure, the European Region has identified four priority intervention areas where the biggest impact can be made: (4)

- Salt reduction
- Promoting healthy consumption – in relation to alcohol; tobacco; and foods high in saturated fats, trans fats, salt, and sugars
- Elimination of trans fats in foods
- Cardio-metabolic risk assessment and management

The secondary goals supporting the Action Plan-mandated interventions include: (4)

- Promoting active mobility
- Promoting health in all settings

A recent United Nations report on the *Prevention and control of noncommunicable diseases* stated that cardiovascular diseases are responsible for the largest proportion (39%) of noncommunicable disease (NCD)-related deaths in people under the age of 70 years. It recommended prevention and treatment measures to be implemented for cardiovascular disease in both low- and middle-income countries. This report highlighted the exponentially growing rate of cardiovascular related deaths which are likely to result in premature heart attacks and strokes affecting people in their economically productive years. (10)

The report outlines a set of actions that are in accordance with the interventions necessary for reducing high BP. These so-called “best buys” are highly cost-effective, culturally acceptable, easy to implement, and include: (10)

- Smoke-free workplaces and public places
- Warnings about the dangers of tobacco
- Comprehensive bans on tobacco advertising, promotion and sponsorship
- Raising excise taxes on tobacco and alcohol
- Restricting access to retail alcohol
- Enforcing bans on alcohol advertising
- Reducing salt and sugar content in packaged and prepared foods and drinks
- Replacing trans-fats with unsaturated fat in food
- Promoting public awareness about diet and physical activity through education and consumer information (including through mass media)

Other interventions thought to be effective, but slightly less cost-efficient, are referred to as “good buys”: (10)

- Nicotine dependency treatment
- Enforcing drink–driving laws
- Promotion of adequate breastfeeding and complementary feeding
- Restrictions on the marketing of foods and beverages that are high in salt, fats, and sugar – especially to children
- Introduction of food taxes and subsidies to promote a healthy diet

The intake of salt, sugar, saturated fats, alcohol, and tobacco are all associated with weight gain, obesity, and heart disease. Promoting healthy consumption; improving food composition and food production; and addressing marketing strategies for unhealthy products is a direct way to combat the high levels of high blood pressure-related disease in the European Region. (4)

This report highlights the effective interventions for combating high blood pressure. It outlines the challenges and the successful interventions used by Member States to address the public health issue of high blood pressure.

3.0 High blood pressure factors and interventions

3.1 Salt and blood pressure

Studies show that there is a causal link between chronically high salt consumption and developing high blood pressure and hypertension. This is due to the reduced ability of the kidneys to excrete salt, and the impact on the blood vessels themselves. (11) This relationship illustrates why salt intake affects the prevalence of cardiovascular disease, high blood pressure, and hypertension. As one study suggests, reducing salt consumption for 12g daily to 9g would result in a 22% reduction in strokes and a 16% reduction in heart attacks in any society. (12) This relationship is thought to increase with age and at higher blood pressures – the older a person is, or the higher their current blood pressure, the more salt consumption negatively impacts their blood pressure. (12)

In Europe, about 70–75% of all salt consumed is hidden in processed foods or other products of the food industry, which are not under the consumer's control. People add the remaining 25–30% at the table. (13) The CDC suggest that, of the 25% of salt added “at the table”, 12% actually occurs naturally in foods, 5% is added while we are cooking, and 6% is added while we are eating (actually at the table). (14) While excess salt consumption is indisputably a global concern, it especially concerns the European Region where the typical diet is high in salt, sugar, lipids, saturated fats, and cholesterol as a result of food such as cured meats, breads, and cheeses. (15)

UK

History & Goals: Beginning in 1996, a group of experts in the UK began lobbying food manufacturers and suppliers to gradually reduce the salt content of foods, and to increase community awareness of the dangers associated with excess salt consumption. (16)

Tools & Results: Building on this initiative, the *Public Health Responsibility Deal* was launched in 2011. The Deal outlines target salt levels for 80 specific food groups. The government also conducts 24 hour urinary assessment surveys as part of their continuous monitoring of the population's salt consumption. (17) Further, a voluntary ‘traffic light scheme’ for labelling has been introduced by the Food Standards Agency where packaged food is labelled based on fat, sugar, and salt content (green = good, yellow = okay, red = bad). Though voluntary, more than 75% of packaged foods feature the label. (18) The UK salt reduction initiatives have successfully seen a reduction in salt consumption from 9.5g/day in 2001 to 8.6g/day in 2008; and caused consumer awareness of daily salt intake recommendations to increase ten-fold. (19)

Reducing salt intake to less than 5g (2000mg sodium, a teaspoon of salt) per person a day is associated with reductions in long-term risk of cardiovascular events and stroke. In a systematic review, it was found that a difference of 5g/day of chronic salt consumption is associated with a 23% difference in the rate of stroke and a 17% difference in the rate of cardiovascular disease in general. (20) The strong, proven relationship between salt intake and increased blood pressure is seen as one of the most cost-effective and affordable public health measures. (4)

The WHO *European Action Plan for Food and Nutrition Policy 2007–2012* includes promoting the reformulation of mainstream food products to reduce salt and ensure the availability of healthier options. (13)

Finland

History & Goals: In the 1970s, Finland started the now-famous North Karelia project. This project focussed on improving community participation, awareness, capacity, and ownership of health in the rural North Karelia region of Finland. (21)

Tools: To be cost-effective, the programme primarily utilized already existing structures to cause change: worksite interventions; television programs (done in the 1980s); print advertisements; working with food manufacturers and supermarkets; anti-tobacco policies and campaigns; the use of community leaders to spread the message; and the important training of health physicians to improve blood pressure screening and education of patients. (21) What is important to note is that the initial implementation, execution, and success of this program was all experienced in a low-income, rural setting.

Results: The original project led to the *Law of 1992*. The law stipulates a maximum salt content for soups, sauces, and salted foods. It created definitions of low and high salt content, and required the term “heavily salted” be placed on the packaging on high-salt food. (22) This legislation has successfully got the food industry on board with the national health initiatives. Today we can see that the project succeeded in causing a 12-20% reduction in smoking amongst men (depending on location); and an 8.1% (men) and 13.9% (women) reduction in blood pressure. (21)

Overall, policy-makers should develop policy based around three pillars: 1) create a monitoring and surveillance system for salt consumption, which is related to noncommunicable diseases, in order to monitor population salt consumption; 2) create a reformulation strategy that enables dialogue and platforms for discussion so that food industry and manufacturer salt targets can be established and collaboration between the industry and government can be enabled; and 3) improvement of population awareness – education needs to be more sophisticated in a way that evolves from simple, inefficient campaigns to comprehensive, effective behaviour change approaches namely based on primary care.

3.2 Fat and sugar consumption and blood pressure

Consumption of trans fatty acids directly contributes to heart disease by raising levels of bad cholesterol (also known as low-density lipoprotein, LDL), reducing levels of good cholesterol (high-density lipoproteins, HDL), and damaging the lining of blood vessels which can lead to inflammation, blockage, and heart attacks. (4) It has consistently been found that higher intakes of saturated and trans fats are associated with increased risk of hypertension and coronary heart disease. (23)

Finland

History & Goals: In attempting to reduce trans fat consumption, Finland has successfully implemented a berry project which helped dairy farmers to switch to berry farming. This initiative aimed to reduce butter and high-fat dairy product consumption, as well as to increase fruit consumption amongst the population without damaging the economic stability of the nation's dairy farmers. (22) Finland further recognized that the lack of a local source of heart-healthy fat alternatives for cooking was negatively affecting their new health initiatives and limiting the implementation of new healthy eating guidelines. One of the primary issues was a high use of butter in cooking with no locally available healthy oil alternatives. (22)

Tools: Collaboration between the Ministries of Health, Agriculture, and Commerce, along with health authorities and execution of health campaigns, was used to promote the value in adding fruit consumption to one's diet and making substitutions when cooking. (22) As such, they invested in the development of a new type of rape plant as it could survive their hard Northern climate and could be processed to produce locally-sourced rapeseed oil (Canola oil) for cooking that is heart friendly and helps to reduce bad cholesterol. (22) Much like the Russian Federation, Finland also used competitions to promote change in diet, physical activity and tobacco consumption. (22)

Results: Finland has succeeded in reducing saturated fat consumption, altering cooking methods, and increasing fruit consumption amongst its citizens. (22) One of their cholesterol-related competitions succeeded in having an entire village's cholesterol levels reduced by 16% in 1997. (22)

The EU as a whole consumes a large amount of fat per year. Specifically, EU citizens each consume 1.5kg of butter per year, or 4 g per day. (24) In 2000, EU Member States reported suffering nearly 600 000 coronary heart disease deaths, and nearly 400 000 deaths due to stroke each year. (25)

Greece

History & Goals: Historically, Greece has had low rates of cardiovascular related mortality which has been associated with the typical Greek diet. However, over the past few decades, increased Westernization of the Greek diet has resulted in an increase in heart-related mortality. In 1999, to address this, the Ministry of Health and Welfare developed food-based dietary guidelines based on the Mediterranean diet (high in vegetable, fruit, and olive oil consumption) to promote the value of a nutritional diet to society. (26)

Tools: A user-friendly poster of this diet, in the form of a food pyramid, was created for easy dissemination and promotion of the pre-Westernized Greek diet as solidification of national dietary guidelines. (27)

Results: Coronary heart disease has been found to be inversely related to the primary components of the Greek diet. (28) (29) The Greek diet is associated with improved levels of good cholesterol compared to bad cholesterol (high- to low-density-lipoprotein cholesterol), high intake of fibre, high intake of antioxidant compounds, and an overall increase in high-density-lipoprotein – all factors that serve to improve blood pressure and reduce the risk of hypertension and coronary heart disease. (29) Though deaths due to ischemic heart disease continued to rise throughout the 1980's and 1990s (reflecting the introduction of Westernized foods) up until the implementation of national dietary guidelines in 1999, the mortality rate has dropped off from a peak of 14067 deaths in 2003 to 11922 deaths in 2009. (30)

It has been found that small dietary changes can result in significant changes in cholesterol levels, and thus blood pressure and heart disease-related deaths. Replacing 1% of dietary saturated fats with 0.5% monounsaturated fats and 0.5% polyunsaturated fats can lower cholesterol levels by 0.06 mmol/l. (25) If everyone in the Member States did this, for example, there would be nearly 10000 fewer deaths due to coronary heart disease, and over 3000 fewer deaths due to stroke. (25)

Poland

History & Goals: In the 1990s, in an effort to reduce saturated fat consumption, Poland addressed its national food subsidies. (31)

Tools: Subsidies for saturated fats, and animal fats in particular, were abolished. Foods primarily composed of unsaturated fats and fruits were made more available and at a lower cost. (31)

Results: Between 1990 and 2002, Poland saw a 38% reduction in coronary heart disease amongst men, and a 42% reduction in women. This significant drop is associated with increased consumption of polyunsaturated fats, a sustained reduction of saturated fats, and increased consumption of fruits. (31)

Policymakers should note that small changes in diet have proven effective in creating substantial health changes. Policy should be used to get rid of trans fats, especially through ensuring that industries are pushed to reformulate their products in order to eliminate trans fats without increasing saturated fats. Combining these changes with salt reduction can have a huge impact on blood pressure related events and mortality rates.

3.3 Smoking, tobacco consumption, and blood pressure

In the European Region tobacco is responsible for 16% of all deaths in adults (aged 30 years or older). This is in stark contrast to global and other regional figures where tobacco is responsible for 3% of adult death in the African region, 7% of adult death in the Eastern Mediterranean region, and 12% of all adult death globally. (32) More specifically, 16% of all deaths due to heart disease in the European Region are related to tobacco consumption. (33) Moreover, the European Region loses 1.6 million lives due to tobacco consumption every year. (34)

There is a strong association between smoking and cardiovascular disease. Acute tobacco consumption is only associated with a temporary rise in blood pressure per cigarette consumed – a rise which subsides after 30 minutes. (35) In fact, many cigarette smokers have lower resting blood pressures than non-smokers – a fact often related to a lower average body mass amongst smokers as compared to non-smokers. (35) However, chronic tobacco consumption causes arterial stiffness that can persist for years after smoking cessation. (36) Further, heavy consumers have increased incidence of hypertension. (37) Alarmingly, when combined with smoking, hypertensive patients are more likely to suffer a reduction in left ventricle function, (38) and thus to experience a cardiac event. Moreover, tobacco consumption is often paired with alcohol consumption (a relationship that becomes stronger as use of either one increases), thus exposing the consumer to multiple risk factors for high blood pressure. (39)

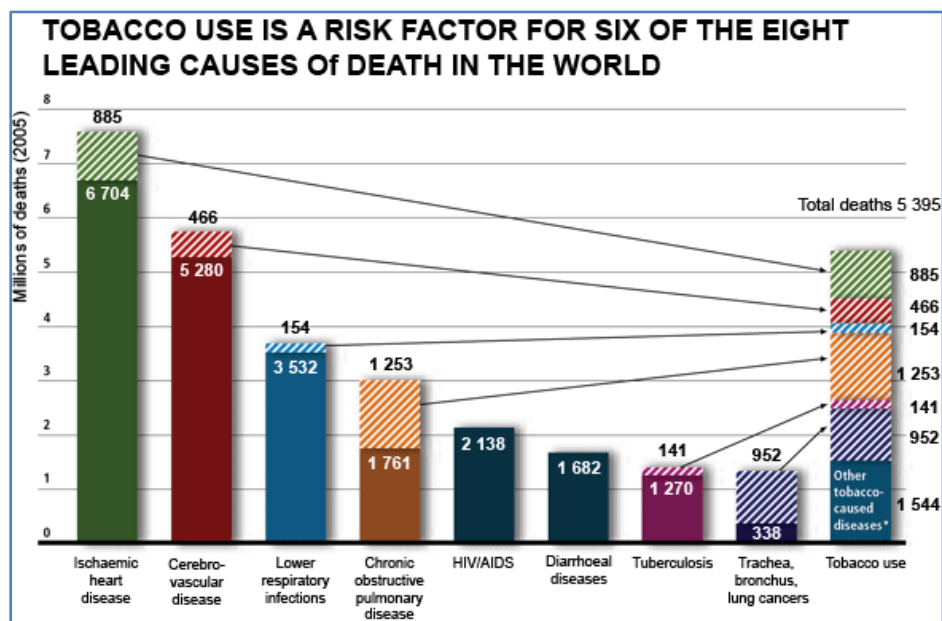


Fig. 1 – Hatched areas indicate proportions of deaths that are related to tobacco use and are coloured according to the column of the respective cause of death. (40)

Tobacco is a known risk factor for cardiovascular disease. Fig. 1 illustrates the correlation of death between tobacco consumption and cardiovascular disease – specifically ischaemic heart disease and cerebrovascular disease (stroke); both of which have been significantly correlated with untreated hypertension. (41) (42)

48 Countries and the WHO European Community as a whole have ratified the WHO FCTC giving them the legitimacy to press for strong tobacco control measures. The WHO FCTC asserts the importance of strategies to reduce both demand and supply of tobacco, and provides a framework for tobacco control measures to be implemented at the national, regional, and international level.

Turkey has successfully worked to implement the best buys depicted in the United Nations report on the *Prevention and control of noncommunicable diseases* through promoting smoke free public places, creating warning labels, establishing restrictions on advertising, and increasing taxation. (43)

Turkey

History & Goals: Turkey has a history of high, unregulated, tobacco consumption which has been correlated to large increases in hospital admissions due to coronary heart disease. (44) In 2000, the Ministry of Health attributed 21317 cardiovascular deaths, 274770 years of life lost, and 321237 disability-adjusted-life-years (DALYs) to tobacco consumption in Turkey. (45) Tobacco control initiatives began in the 1980s, with real action starting in the 1990s that actually sought to control, reduce, and prevent tobacco consumption. (46)

Tools: In 1996, a new government enacted Law No. 4207, *Preventing Harms of Tobacco Products*. (47) This law banned smoking in some public places, banned all tobacco advertising and promotion, banned sale of tobacco to minors, required health warnings on tobacco packaging and required national television stations to dedicate 90 minutes of air time per month to depicting the harmful impact of tobacco consumption. (47) To monitor and regulate the new law, the Tobacco Regulatory Authority was created in 2002. (48) In addition to upholding the Law No. 4207, the Authority has since banned tobacco products from being on display to the public, and also works to raise awareness about the harms associated with tobacco. (46) Additionally, Turkey is yet another country of the European Region to ratify the WHO FCTC. Most recently, in 2008, Turkey implemented the *Law on Prevention of Hazards of Tobacco Products* (an amendment of Law No. 4207 meant to affect the health care sector and to include services to help citizens terminate their tobacco consumption), and implemented a smoke-free policy (clean air law). (49)

Results: There has been a small decline in overall tobacco consumption from 33.6% of the population in 1993 to 31.2% in 2008. (50) (51) Most impressively, men have seen a reduction from 57.8% in 1993 to 47.8% in 2008. In the same time span, women have increased from 13.5% in 1993 to 15.2% in 2008 – highlighting negative social trends of acceptable habits. (50) (51) These changes, though recent, have already affected a 33.6% decrease in acute cardiovascular conditions being admitted to local hospitals. (52)

Higher tobacco taxes help to prevent young people from starting to smoke. However, while taxes have proven successful, both tobacco and cigarette taxes must be in alignment to prevent consumers from switching methods or brands. (53) Similarly, the price difference between the cheapest and most expensive brands must be nominal to, again, prevent brand switching as opposed to reduced consumption as the consumer's solution. Such pricing and taxing initiatives should be coordinated with neighbouring countries to prevent smuggling problems and to avoid consumers from simply making cross-border trips to fulfil their tobacco needs. (53) Finally, taxation should keep pace with inflation and incomes in order to maintain their expensive status. (53)

Russian Federation

History & Goals: The Russian Federation approved the WHO FCTC – thus sealing their anti-tobacco commitment.[1] In 1999, the Russian Federation implemented the *Arterial Hypertension in the Elderly Hypertensive patients* program aimed at reducing smoking amongst hypertensive elderly patients.

Tools & Results: The program successfully reduced smoking prevalence by increasing drug therapy use, and improving the overall treatment process of elderly patients with high blood pressure through targeted treatment methods. (54)

Policymakers should note that increasing tobacco product taxes with simultaneous information campaigns and alternative intervention implementation is the most successful method for reducing population consumption of tobacco. Further, following the suggestions of the WHO FCTC is strongly suggested. The Framework illustrates that utilizing health warnings on tobacco packages (combining text and pictures) is one of the most cost-effective measures that can be implemented to increase public awareness about the harmful effects of tobacco consumption. (1) Further, consumption should be banned in public places, and advertising should be controlled, if not banned.

3.4 Alcohol and blood pressure

Alcohol consumption is directly related to high blood pressure. As consumption increases, so does blood pressure. This is especially a concern for heavy drinkers (3-4 drinks/day or more) where the associated increase in blood pressure is greater. Of further concern, alcohol consumption has a prolonged impact on blood pressure in chronic drinkers. (55)

Russian Federation

History: The Russian Federation has implemented anti-alcohol campaigns as preventive measures.

Tools & Goals: These include the use of a television series, health awareness workshops for teenagers, and the creation of health advice rooms as part of medical institutions across the country. (56) These campaigns aim to cut alcohol consumption in half by 2020.

Results: The Russian Federation has seen a 17 % reduction in alcohol consumption - down from 18 litres to 15 litres per capita from 2010 to 2012 (57)

The European Region consumes the highest amount of alcohol in the world – approximately double the world average (58). In 2009 the average adult, 15 years of age or older, consumed 12.5 litres of pure alcohol – the equivalent of 27g of pure alcohol or nearly three standard drinks a day per person (58).

The *European action plan to reduce the harmful use of alcohol 2012-2020* cites alcohol as one of the world's top priorities in the battle for improved health. Alcohol is the largest contributor of ill health and premature death in the European Region, and the third largest contributor globally. (59) Together with smoking and traffic accidents (which are frequently associated with alcohol consumption), alcohol causes 40% of ill health and premature deaths in the European Region. This relationship is highly correlated to a country's per capita alcohol consumption and level of alcohol dependence; (59) and the fact that alcohol has a large impact on blood pressure and heart health. (60)

Republic of Moldova

History & Goals: In 2010, the Republic of Moldova implemented numerous interventions to restrict alcohol consumption as it currently the world's largest consumer of alcohol at 18.22 litres per capita per year.

Tools: An evaluation of the effectiveness and cost-effectiveness of the interventions revealed that the Republic of Moldova had the most success with increasing alcohol taxes by 25%. Taxation measures were supported by prohibition of alcohol sales to those under the age of 16, testing drivers for blood alcohol volume, informing the population about the dangers of excessive alcohol consumption, and efforts to prevent the illegal manufacturing of alcohol.

Results: On the whole, the interventions succeeded in saving 6114 healthy years of life in 2010, with the opportunity to increase this figure to 17736 lives per year with continued widespread implementation of the current interventions. (61)

Of further importance, significant reductions in alcohol consumption are directly related to mean blood pressure reduction – via a dose-response relationship (meaning the larger the reduction in consumption, the greater the improvement in blood pressure). Reducing alcohol consumption is vital to the prevention and treatment of high blood pressure amongst heavy drinkers. (62) Specifically, studies have shown that there is a linear relationship between alcohol intake and blood pressure. In one study it was found that heavy drinkers have 17.6mmHg greater systolic pressure and 10.9mmHg greater diastolic pressure than lighter drinkers. (63) While the direct relationship between alcohol and hypertension is unknown, studies of hypertensive patients have found that up to 40% are considered heavy drinkers (those who consume more than 40g alcohol/day). (63)

Policymakers should seek to implement the “best buys” through addressing three areas proven to have a positive impact on alcohol consumption: marketing (advertising), availability (retail), and best prices (taxation). Additionally, interventions should target young people in order to impact future lifestyle habits.

3.5 Cardio-metabolic risk assessment, management, and blood pressure

Studies show that cardio-metabolic risk assessment and management enables early identification and modification of risk factors for high blood pressure. It is further recognized as an effective intervention against the development of high blood pressure and hypertension. (4)

Kazakhstan

History & Goals: In 2005, Kazakhstan developed new clinical practice guidelines with a focus on improving clinical detection and management of high blood pressure and improving patient adherence to health advice and prescribed medications. (64) The guidelines were first implemented in pilot facilities, and then scaled up to additional regions of the country.

Tools: The approach emphasized: (64)

- Orientating physicians on appropriate clinical practice
- Informing the public on the risks of hypertension and the need for annual screening
- Creating an outpatient drug benefit package
- Increasing patient screening
- Increasing patient adherence to health advice and prescribed medication
- Improving compliance to advice regarding physical activity and diet (including fat and salt intake)

Results: These new guidelines were found to improve case-finding, patient adherence to prescribed medications, reduce salt consumption, increase regular exercise, increase the number of patients with healthy blood pressures (from 14% to 26.2%), and to reduce the number of patients with high blood pressure (from 51.6% to 35.8%). (64) These successful components were incorporated into Kazakhstan's national protocols for hypertension in 2006. Further, the new protocols were incorporated into postgraduate medical education programs where a computer-based learning model is near completion. This computer-based model aims to further expose more doctors to new methods and tools expected to be used for the treatment of high blood pressure in the future. (64)

Policymakers need to assess their local health system model to gauge the blood pressure screening and prevention measures. By incorporating simple screening methods at every medical appointment, issues can be identified and addressed early-on.

3.6 Promoting active mobility and blood pressure

Physical inactivity is recognized as a major independent risk factor for high blood pressure (and noncommunicable diseases in general), causing about 3.5% of the disease burden and up to 10% of deaths in the European Region. The economic costs attributable to physical inactivity are enormous. The health impacts and their related costs could be reversed by increasing levels of physical activity. Regular moderate physical activity is a very cost-effective way of improving and maintaining people's health. (65)

The *European Charter on Counteracting Obesity* aims to curb the obesity epidemic and reverse the current trend in the European Region. It details key actions needed to encourage healthier diets and physical activity. (66) The importance of physical activity for tackling the obesity epidemic and beyond is stressed in the Charter, and is reflected in the guiding document *Steps to health: a framework for action in the WHO European Region*. (65)

Further, the *Parma Declaration on Environment and Health*, adopted by WHO European Member States at the *Fifth Ministerial Conference on Environment and Health* held in Parma, Italy, on 10-12 March 2010, underscores the importance of providing safe environments to enable physical activity, and commits countries to work towards the achievement of targets to that effect. (67)

Slovenia

History & Goals: In 2000, Slovenia created *Programme MURA* which sought to improve the lifestyle of its citizens and to create health as the basis for all new policy and programming.

Tools: As part of the programme, the *Let's live healthily* campaign was created. The campaign aimed to create individual ownership for one's own health and to improve health awareness.

Results: So far, the programme has succeeded in reaching 30000 people with 80% of participants reporting a permanent change in their lifestyles. Specifically, Slovenia is working on more prominently incorporating physical activity, such as through Nordic walking centres, into the programme. (68)

Such campaigns have proven successful. Policymakers should understand the value in 'thinking outside the box' for creative ways to promote mobility within society, to make change a possibility, and to educate the population on the benefits associated with physical activity.

3.7 Promoting health in all settings and blood pressure

Most people understand the basic building blocks of health, but may not act on their knowledge. It is easy to tell a population to eat well, drink less, avoid tobacco, and exercise, but it is more difficult to see such orders come to fruition. This is why it is important to create environments that cue health supporting behaviours, whether they be preventative or curative. This approach to health promotion in all settings can be referred to as nudging and regulating actions. (69)

Table 1- Examples of nudging and regulating actions

	Nudging	Regulating
Smoking	Make non-smoking more visible through mass media campaigns communicating that the majority do not smoke and the majority of smokers want to stop	Ban smoking in public places
	Reduce cues for smoking by keeping cigarettes, lighters, and ashtrays out of sight	Increase price of cigarettes
Alcohol	Serve drinks in smaller glasses	Regulate pricing through duty or minimum pricing per unit
	Make lower alcohol consumption more visible through highlighting in mass media campaigns that the majority do not drink in excess	Raise the minimum age for purchase of alcohol
Diet	Designate sections of supermarket trolleys for fruit and vegetables	Restrict food advertising in media directed at children
	Make salad rather than chips the default side order	Ban industrially produced trans fatty acids
Physical activity	Make stairs, not lifts, more prominent and attractive in public buildings	Increase duty on petrol year on year (fuel price escalator)
	Make cycling more visible as a means of transport, eg. Through city bike hire schemes	Enforce car drop-off exclusion zones around schools

Source: (69) - Marteau T, al. e. Judging nudging: can nudging improve population health? BMJ. 2011; 342: p. 263-65. <http://www.bmj.com/content/342/bmj.d228>

Table 1 outlines a set of proactive suggestions for regulation that can be used to help create environments in which people actively choose healthier options – options which can result in reduced blood pressure.

Russian Federation

History & Goals: In the early 1980s, the Russian Federation implemented the *Countrywide Integrated Noncommunicable Disease Intervention* network (CINDI), an international collaborative network of 27 member countries, which is the most comprehensive noncommunicable disease prevention program in the Russian Federation. They have further implemented the *Health Protection and Strengthening among the Healthy Population for Years 2003-2010* with the goals of educating and preparing health professionals; standardizing medical support, legal support, technical support, informational support, and scientific support; and developing a management system. (21)

Tools & Results: Together, these programs have led to the successful reduction of high blood pressure and cardiovascular disease prevention through prevention and promotion programs. Workplaces have successfully implemented programs that reveal hypertensive symptoms amongst their workers – resulting in a 25% reduction in CVD-related incidents and a 27% reduction in work-days lost due to illness. (21) Some workplaces have provided high blood pressure screenings, medical management, and education about high blood pressure. In the community there has been *Quit and Win* competitions drawing thousands of participants since their initiation in 1994. These competitions are associated with a 12-32% success rate (depending on location) in participants remaining smoke-free at the one-year follow-up mark. (21)

Finland

History & Goals: in 2007, Finland launched the Policy Program for Health Promotion which sought to improve the inclusion of opportunities for society to make healthy decisions. The original project from the 1970s was extended to include a comprehensive national monitoring system to facilitate disease prevention and health promotion in Finland. This has enabled ongoing nutrition information for the population, as well as monitoring of health trends, and the promotion of relevant health policy changes to address the society's needs. (22)

Tools: Finland has increased the alcohol and tobacco taxes, as well as the soft drink and sweets taxes as a way to guide citizens into reducing consumption of unhealthy foods. Further, legislation was created to regulate the content of food made by food manufacturers. (70)

Results: These various initiatives have successfully reduced butter consumption (by % of population) from 60% in the 1970s to 5% in 2000. Salt intake has decreased from about 15g in the 1970s to 11g in men and 7g in women today. Blood pressure has decreased by 5% in men, and 13% in women, and there has been a 65% reduction in mortality from heart disease since the 1970s. (22) On the whole, Finland has achieved profound success in causing significant dietary change amongst society that has equated to great reductions in health issues – particularly those related to high blood pressure and cardiovascular diseases. (71) Nationally, Finland has seen an 80% reduction in annual cardiovascular disease mortality rates amongst the working-age population and an increase in life expectancy by 10 years. (70)

It is as simple as altering opt-in systems for healthier defaults. Policymakers can assess current programs and policies to make adjustments where negative choices are the initial default. Policies can be made or altered to support relevant stakeholders in the change to a pro-health nudging and regulating system.

4.0 Conclusions

High blood pressure has serious health implications as it is a major risk factor for serious cardiovascular events, including ischaemic heart disease and stroke. In the European Region these issues are particularly relevant as the increasing prevalence and incidence of the diseases caused by high blood pressure are evident via both morbidity and mortality rates. Nevertheless, there are clear examples where nations have implemented interventions, and have been successful in improving public health and reducing blood pressure.

While many of these interventions are cost-efficient and applicable across the entire European Region, it is important that every country and community understand their own local needs, and find suitable solutions. These interventions should provide a starting point – a point of inspiration – for communities to realize that preventing high blood pressure and cardiovascular disease is possible through a set of tangible interventions. Strong guidance is required from political heads in order to impact the morbidity and mortality rates associated with high blood pressure – and with noncommunicable diseases as a whole. (2) Most importantly, simple, but focused, cost-effective interventions can have a significant impact on prevention and reduction of high blood pressure and the diseases it causes.

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