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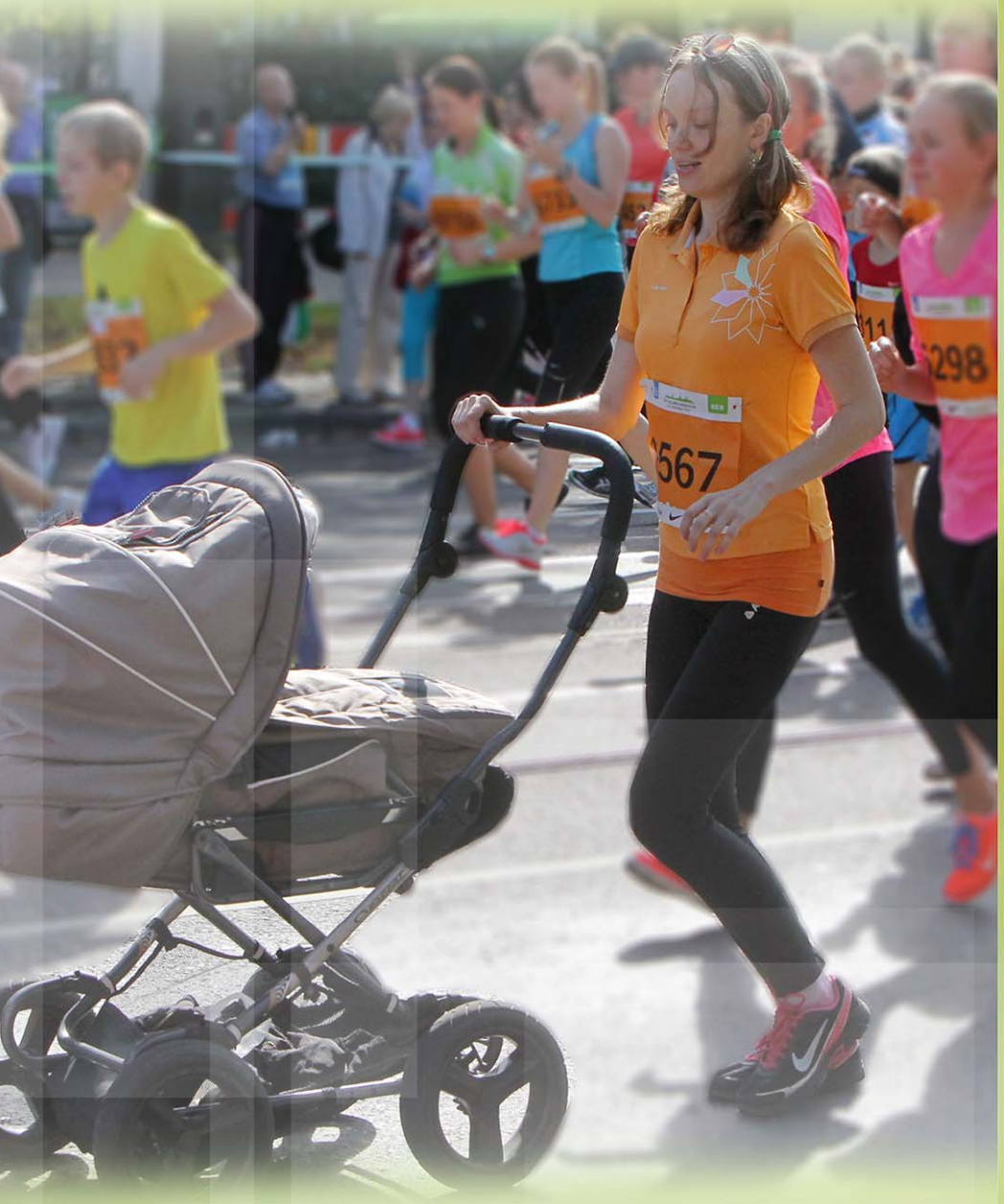
Better noncommunicable disease outcomes: challenges and opportunities for health systems



ESTONIA

Country assessment

Taavi Lai
Anne Stæhr Johansen
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Abstract

This report reviews health system challenges and opportunities in Estonia to scale up core services for the prevention, early diagnosis and management of noncommunicable diseases. Outcomes of noncommunicable diseases have been improving and Estonia is closing the gap with other EU countries. In part this is due to progress implementing core population interventions such as tobacco control, prevention of harmful use of alcohol and improving nutrition and physical activity. The assessment recommends that to further strengthen the health system response to NCDs, Estonia should consider the following six areas: strengthening coordination and governance; introducing chronic disease management systems based on family medicine; accelerating action on obesity and nutritional risk factors for noncommunicable diseases; upgrading the e-health system into an integrated clinical and decision support system; empowering patients, and; analysing the case for change and refining plans for addressing noncommunicable diseases.

Keywords

CHRONIC DISEASE
HEALTH CARE SYSTEM
UNIVERSAL COVERAGE
HEALTH PROMOTION
PRIMARY HEALTH CARE
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Acronyms and abbreviations

CVD	Cardiovascular disease
EHIF	Estonian Health Insurance Fund
FAO	Food and Agriculture Organization of the United Nations
NAO	National Audit Office
NCD	Noncommunicable disease
NHP	National Health Plan
NIHD	National Institute of Health Development
PHC	primary health care

Introduction and rationale

Noncommunicable diseases (NCDs) are responsible for over 60% of deaths globally (WHO, 2011). This burden is one of the main public health challenges faced by all countries, regardless of their economic status (WHO, 2011), and threatens economic and social development. Without concerted efforts at country level, the prevalence of these diseases is predicted to increase in the coming decade.

In Europe, the situation is worse than the global average, as the four main NCDs [cardiovascular disease (CVD), cancer, chronic obstructive pulmonary disease and diabetes] account for the vast majority of the disease burden and for premature mortality in the Region (WHO Regional Office for Europe, 2013). In the European Region, NCDs account for nearly 86% of deaths and 77% of the disease burden, placing increasing strain on health systems, economic development and the well-being of large parts of the population, in particular those aged 50 years and older.

NCDs also have a significant macroeconomic impact and exacerbate poverty (Bloom et al., 2011). Most NCDs are chronic and require repeated interactions with the health system and recurring and continuous medical expenses, often requiring catastrophic, impoverishing expenditure. It has been estimated that the loss of productivity due to NCDs is significant: for every 10% increase in NCD mortality, economic growth is reduced by 0.5%.

Like many countries, Estonia faces a growing burden of NCDs, which are the main causes of mortality and morbidity (Lai & Köhler, 2009). In recent years, the Government has taken a number of initiatives to increase the efficiency of resource allocation, provide incentives to improve service delivery for NCDs, improve the infrastructure for service delivery and address the risk factors associated with NCDs.

This country assessment is part of a project of the WHO Regional Office for Europe to increase support to Member States for strengthening their health systems for better NCD outcomes. Seven assessments have been conducted to date, in Belarus, Croatia, Hungary, Kyrgyzstan, the Republic of Moldova, Tajikistan and Turkey. The same approach and multidisciplinary assessment teams were used for all the country assessments, which are based on a structured guide outlined in a background paper on the role of health systems in reducing NCDs (WHO Regional Office for Europe, 2014a). While the same guide was used for all the country assessments, the recommendations can be revised for each country. Thus, the Estonian assessment covers CVDs and diabetes but not cancer and pays particular attention to nutrition and alcohol and tobacco consumption.

The objectives of this country assessment are twofold. The first is to identify factors that limit use of the Estonian health system to its full potential, to form the basis for pragmatic, contextualized, useful policy recommendations for health system strengthening to improve NCD outcomes in Estonia. The assessment and its policy recommendations propose the elements of a comprehensive NCD action plan that could integrate existing actions. Secondly, as part of a regional project, the assessment will contribute to understanding and experience in the Region on common health system challenges, opportunities for NCD control and promising approaches to tackling NCDs and related issues.

To meet these objectives, a multidisciplinary WHO expert team visited Estonia on 8–12 September 2014 and met with a wide range of experts and others involved in NCDs in Estonia. Consultations were held in several departments of the Ministry of Social Affairs, the Estonian Health Insurance Fund (EHIF), the National Institute for Health Development (NIHD), the Health Board, the Estonian e-Health Foundation, the University of Tartu, Tartu Health Care College, two hospitals, family practices and specialist and patient organizations. Presentations, small group discussions and individual interviews were used to share information, review data,

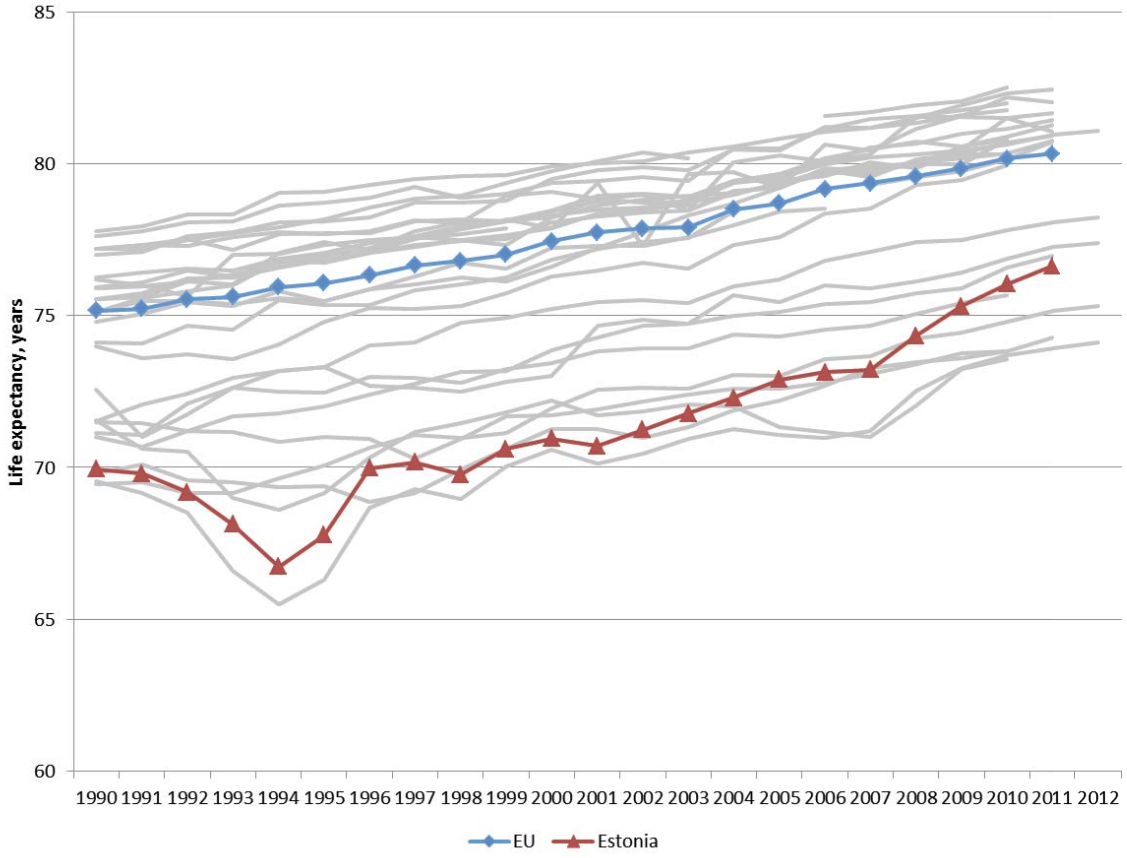
identify successes and challenges and build consensus on key points in the assessment. During these visits, team members gathered first-hand impressions and compared information from documents, discussions and presentations with the reality on the ground. Initial impressions formed during the mission and a first draft of this report were presented to the Ministry of Social Affairs.

The first section of the report outlines trends in NCD outcomes in Estonia, through mortality indicators. The second section reports an assessment of the coverage of the core population-based interventions and individual services for NCDs, and the third presents health system achievements and barriers for NCD interventions and services. The fourth section describes good practices in Estonia, and the fifth concludes the report with policy recommendations.

1. Noncommunicable disease outcomes

Estonia saw a significant overall reduction in mortality and longer life expectancy during the 2000s (Fig. 1.1). Changes in life expectancy at birth in Estonia can be observed in two distinct periods since the country regained independence in 1991. Life expectancy fell from 69.8 years in 1991 to 66.7 years in 1994, the lowest since before 1960; it then increased, until it reached its initial level in 1998. The all-time high—71 years in 1988—was reached in 2000. During the second decade, life expectancy increased from 71 to 76.6 years in 2011, a faster growth than in other countries in the European Union during the same period. As a result, the gap between average life expectancy in Estonia and in the European Union decreased from 9.2 years in 1994 to 3.7 years in 2012, a 60% reduction. The largest gaps in life expectancy between that in Estonia and that in the European Union were 12.3 years between Sweden and Estonia in 1994 and 5.8 years between Estonia and Spain in 2011.

Fig. 1.1. Life expectancy at birth in Estonia and in the European Union, 1990–2012



Values for the European Union average and for Estonia are highlighted; grey lines show other European Union countries.
Source: European Health For All database (WHO Regional Office for Europe, 2014b)

There are still significant inequalities in life expectancy and mortality. Considerable improvements in health have been observed in all population groups; however, while the health gaps have decreased somewhat in some groups, they remain. For example, the difference in life expectancy between men and women in Estonia decreased during 1994–2011 but was still more than 10 years in 2011 and increased slightly again in 2012. The average gender difference in life expectancy in the European Union in 2011 was 5.8. Thus, the large gender gap in Estonian life expectancy is one of the main contributors to the overall difference in life expectancy between the European Union and Estonia. Reducing premature mortality among Estonian men would improve the life expectancy of the Estonian

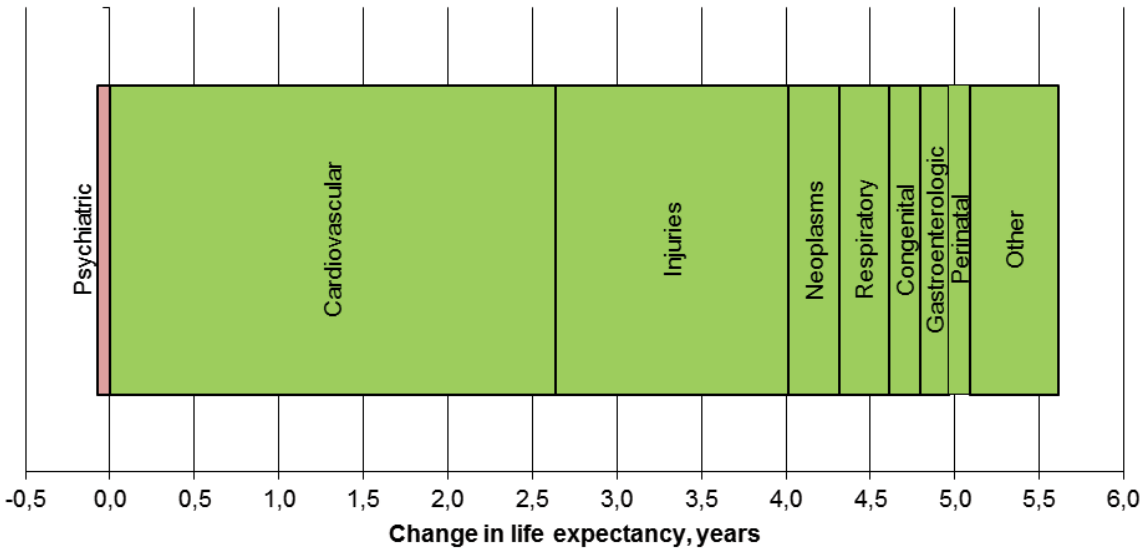
population to the European average and would in fact exceed the European Union average by 0.6 years. In population groups defined by ethnicity, education and region, the absolute improvements were larger among ethnic Russians, people with the lowest educational level and people living in Ida-Viru County; as a result, the absolute inequality in mortality decreased among groups. Despite this progress, the mortality rates remained higher among non-Estonians, people with lower education (see Fig. 1.2 for standardized mortality rates) and residents of Ida-Viru County. Although mortality in other groups improved less, the relative health inequality still increased slightly by educational level and place of residence.

Fig. 1.2. Standardized mortality rates (SMRs) by gender and educational level in people aged ≥ 30 years in 1998–2002 and 2010–2013

Source: T. Lai & M. Leinsalu, unpublished report, 2014.

Reductions in deaths from circulatory disease and external causes of death contributed the most to the overall improvement in life expectancy and to the greater decrease in mortality among non-Estonians, people with lower levels of education and people living in Ida-Viru County. Fewer deaths from all circulatory diseases contributed 2.6 years to the increased life expectancy in Estonia during 2000–2012 (Fig. 1.3), followed by external causes, which contributed 1.5 years. Improvements in these two disease groups contributed 71% of the total increase in life expectancy during that period. The only disease group that slowed the increase in life expectancy was psychiatric diseases; alcohol-related conditions were the main cause of death in this disease group.

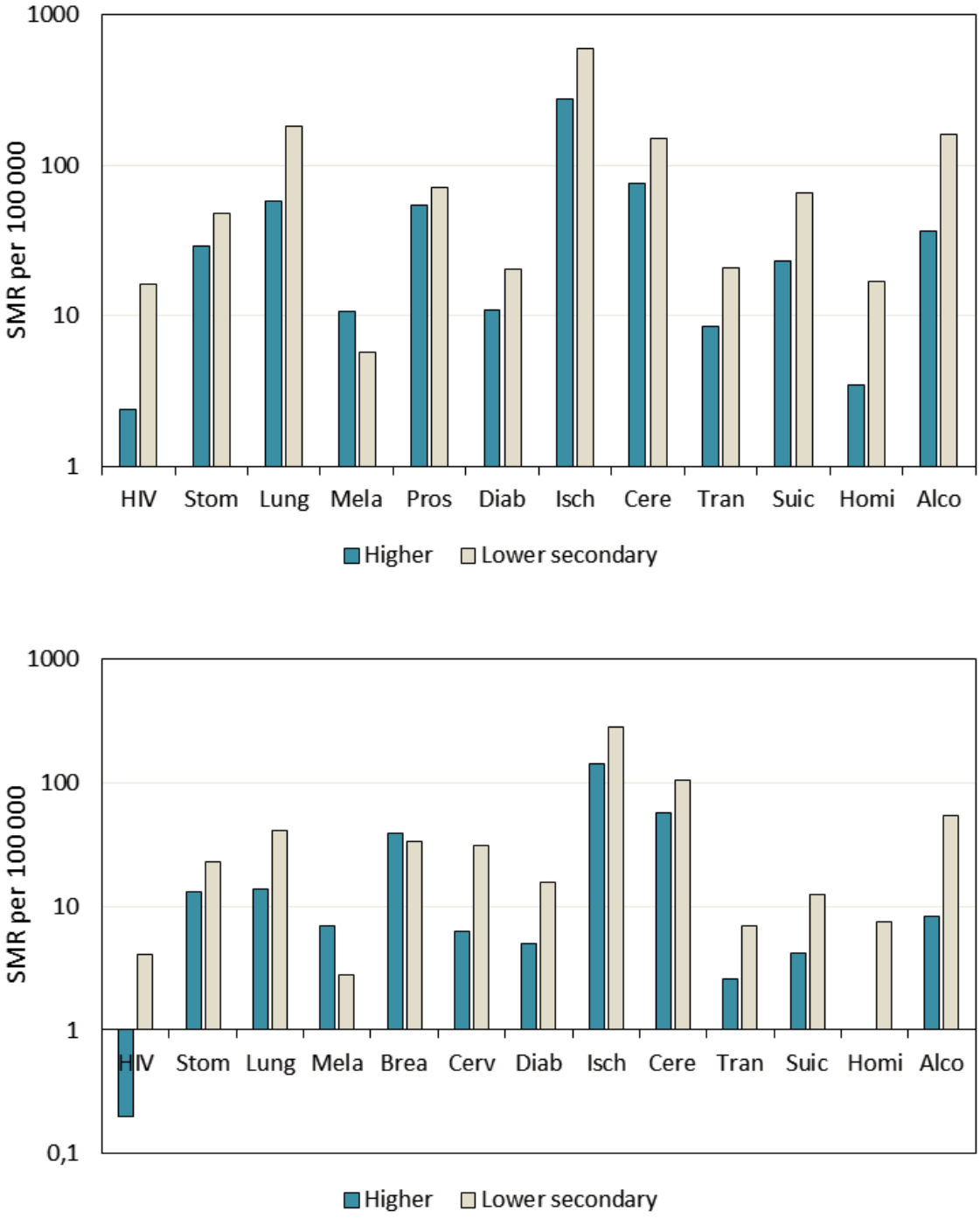
Fig. 1.3. Changes in the life expectancy of the total population according to main disease group (ICD-10) and causes of death, 2000–2012



Source: T. Lai & M. Leinsalu, unpublished report, 2014.

Behavioural risk factors and their interactions play important roles in inequality in mortality and life expectancy. For example, the nearly three times higher rate of mortality from lung cancer among men with the lowest education may be the result of the association between level of education and smoking prevalence (Fig. 1.4).

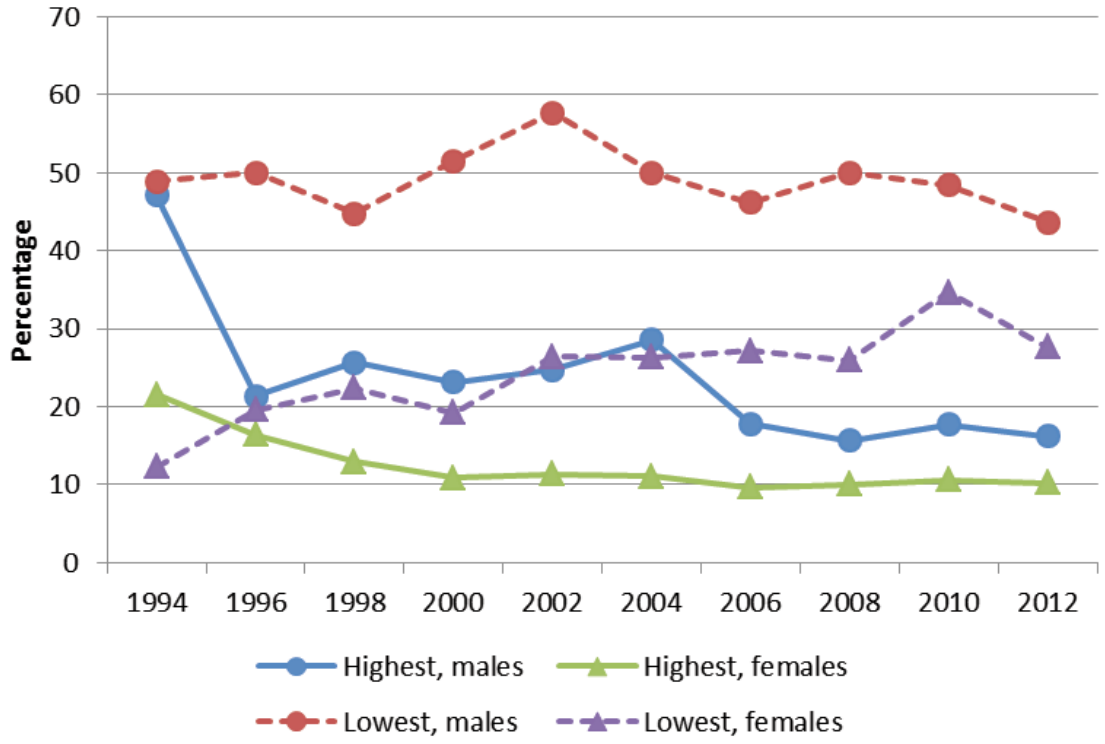
Fig. 1.4. Standardized mortality rates (SMRs) for selected causes of death among men and women with higher education and lower secondary education, 2010–2013



Stom: stomach cancer; Lung: lung cancer: Mela: malignant melanoma; Pros: prostate cancer; Brea: breast cancer; Cerv: cervical cancer; Diab: diabetes; Isch: ischaemic heart disease; Cere: cerebrovascular disease; Tran: transport accidents; Suic: suicide; Homi: homicide; Alco: deaths directly attributable to alcohol. Rates presented on logarithmic scale.
Source: T. Lai & M. Leinsalu, unpublished report, 2014.

The greater decrease in mortality from lung cancer among more highly educated men corresponds to the patterns of the smoking epidemic (Fig. 1.5), although there is some evidence that mortality from lung cancer has also begun to decrease among less educated men. Among women, the mortality rate from lung cancer has stabilized among those who are highly educated or with mid-level education, but it has increased considerably among women with the least education, indicating that smoking has become more common among women in the lower social classes. Similarly, smoking has affected inequalities in mortality from other causes of death (e.g. CVD and chronic respiratory disease), although the time before onset of these diseases and the related mortality might be different from those for smoking-related cancers. Smoking has also contributed to higher mortality rate among ethnic Russian males (T. Lai & M. Leinsalu, unpublished report, 2014).

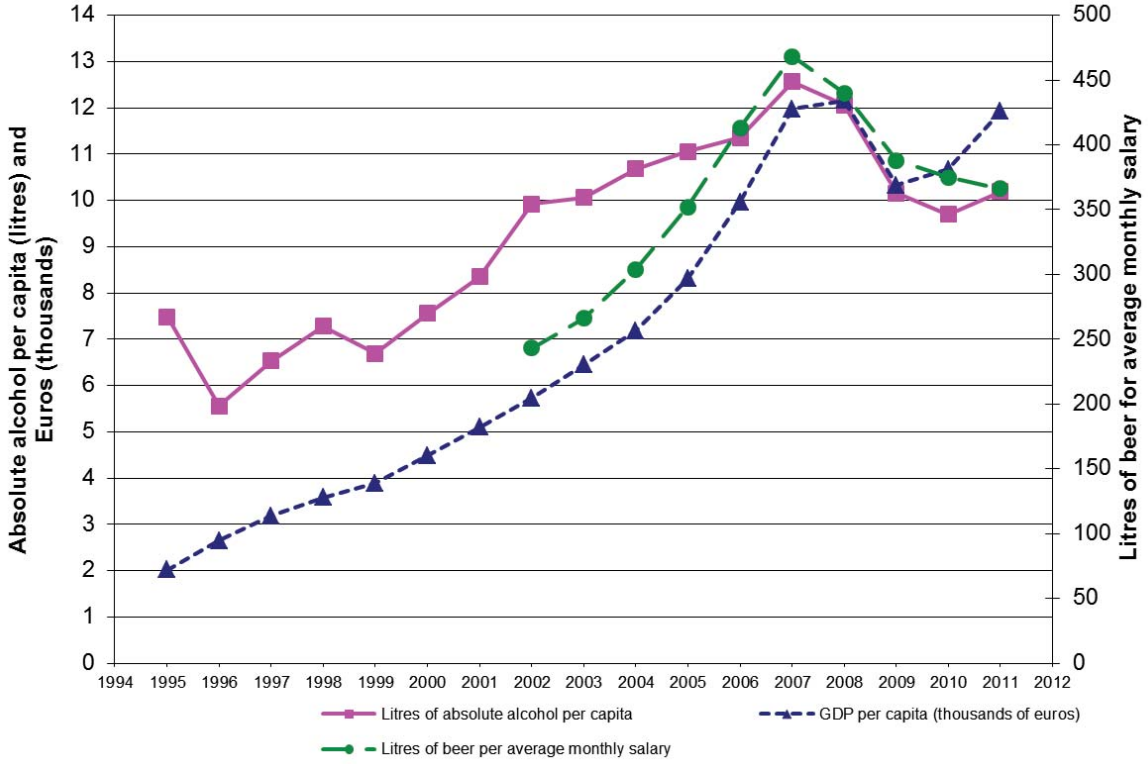
Fig. 1.5. Percentage of daily smokers among men and women in the Estonian adult population (16–64 years) by level of education, 1994–2012



Source: NIHD (2014).

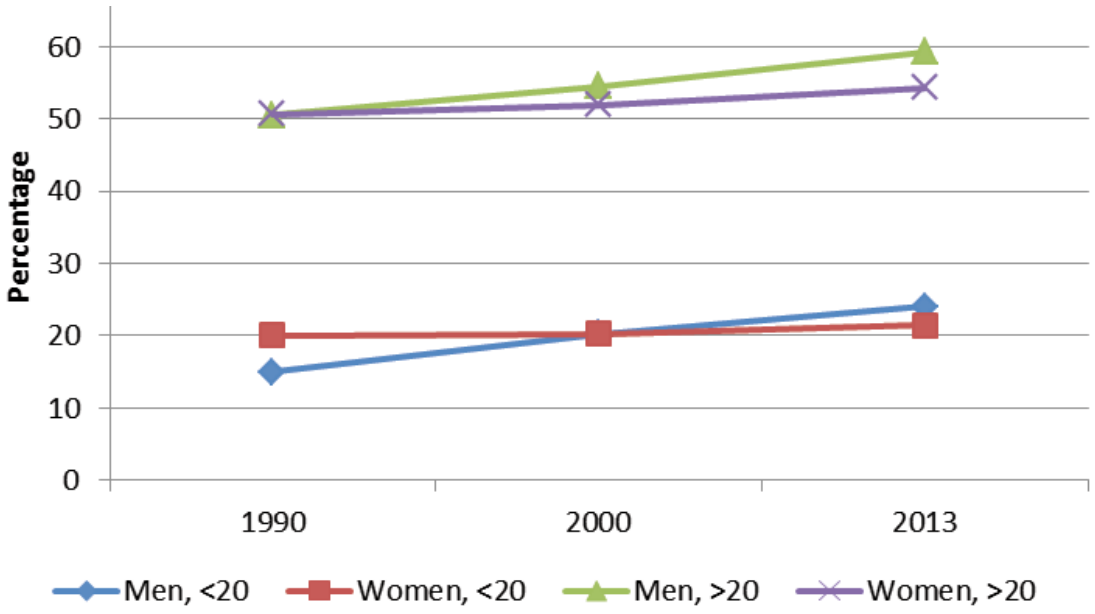
A strong risk factor for both overall mortality and social inequalities in mortality is alcohol consumption (Fig. 1.6). The mortality rate from causes of death directly related to alcohol consumption was higher among men and women with the least education, and ethnic Russian men and women had higher mortality rates than Estonians. During the 2000s, however, the mortality rate from these causes decreased to a greater extent among people with the least education and among ethnic Russians, reducing the gap in absolute mortality between Estonians and Russians and between people with high and low levels of education. The real impact of alcohol consumption on social inequality in mortality is actually much greater, as alcohol use is strongly related to many external causes of death, such as assault, intentional self-harm and accidents, all of which have a strong inverse social gradient. Alcohol consumption has also been associated with higher mortality from circulatory diseases. Alcohol-related causes of death are associated with the fact that psychiatric conditions was the disease group that slowed the increase in life expectancy during 2000–2012. The greatest impact was seen in 2007, when alcohol consumption in Estonia was higher than in other years (Fig. 1.6) (Baburin et al., 2011; T. Lai & M. Leinsalu, unpublished data, 2014).

Fig. 1.6. Alcohol consumption (litres of absolute alcohol per capita), number of litres of beer that can be bought with an average monthly salary and GDP per capita, Estonia, 1994–2011



Source: updated from Lai & Habicht (2011).

Fig. 1.7. Prevalence of overweight and obesity among Estonian men and women < 20 years and > 20 years, 1990, 2000 and 2013

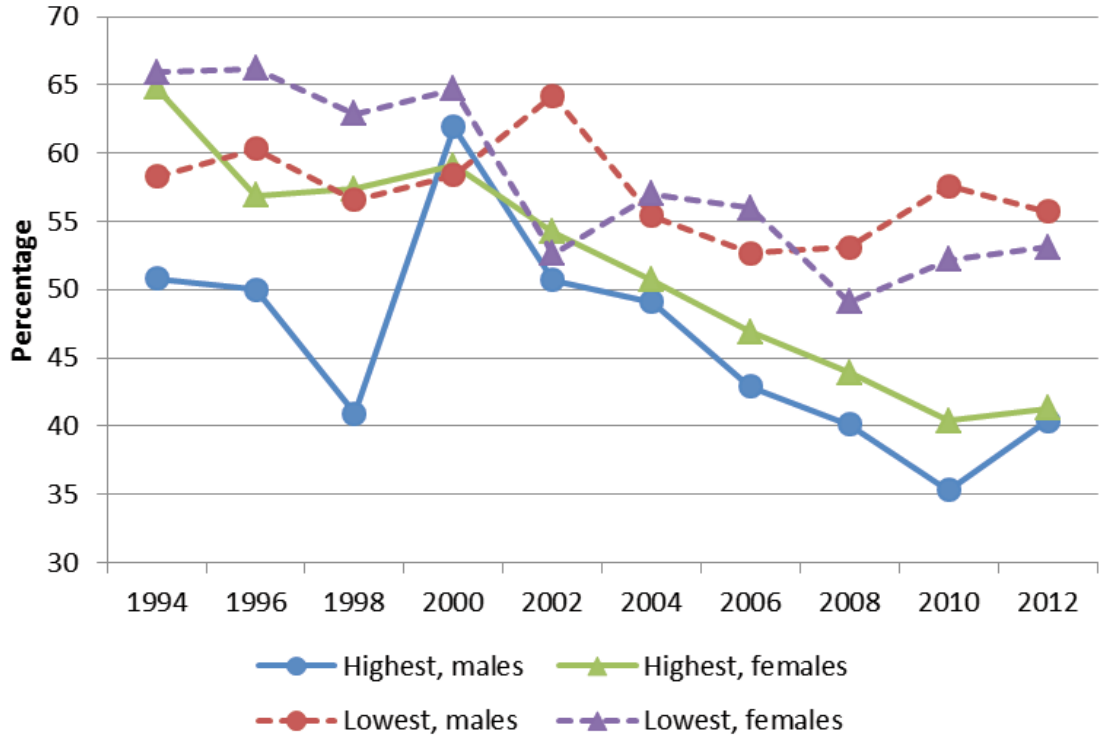


Source: Ng et al. (2014).

Overweight and obesity also contribute to social inequality in mortality. These are the main risk factor for type 2 diabetes (mellitus) and among the leading risk factors for CVD, and their prevalence differs by socio-economic status. While in 1998–2002, a negative gradient in mortality

from diabetes by attained educational level was seen only for women, a negative gradient was also seen for men by 2010–2013 (Fig. 1.4), when the mortality rate among men with the lowest level of education was nearly twice as high as that of men with a higher level of education; among women, the difference was more than three times (T. Lai & M. Leinsalu, personal communication). The proportion of overweight people has been increasing (Fig. 1.7), despite a decrease in the number of physically inactive adults during the same period (with a faster decrease among groups with higher education) (Fig. 1.8). According to the Institute for Metrics and Evaluation (2014), dietary behaviour had become the greatest contributor to the Estonian burden of disease and was directly related to a number of health risks. **High blood pressure** was the second most important health risk (Fig. 1.9).

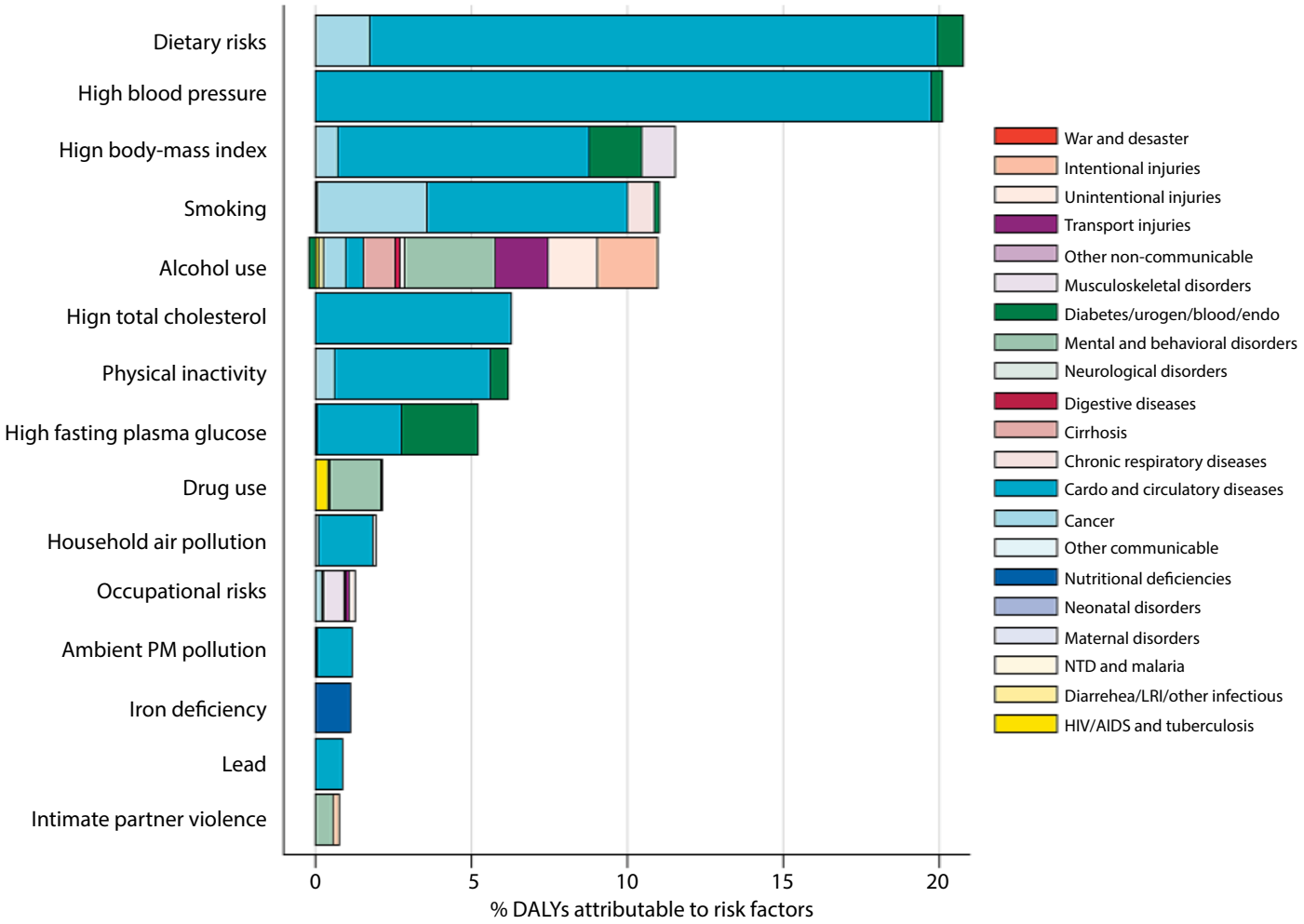
Fig. 1.8. Proportions of male and female adults (aged 16–64 years) in the highest and lowest education groups who exercise for at least 0.5 h less than once per month, 1994–2012



Source: Ng et al. (2014).

Estonian progress towards achieving global voluntary targets for NCDs by 2025 is uneven. Arithmetic projections have been made of the proportions of physically active people, daily smokers and overweight people and the overall level of alcohol consumption by 2025. The target of a 10% increase in physical activity will probably be met, on the basis of recorded trends. The target for a 10% decrease in alcohol consumption can be met, although consumption would still be significantly greater than the proposed 6 L of pure alcohol per capita (> 9 L per capita). Current trends in smoking and obesity, however, indicate that the targets for these factors will not be met. Trends in smoking indicate that the reduction will be about 10% instead of the targeted 30%, and the trend in obesity is actually towards an increasing prevalence instead of halting the increase altogether, which was the aim. As the incidence of high blood pressure is unknown, it is not possible to determine whether the target will be achieved. Mortality from hypertension is increasing rapidly in Estonia; however, as there are no data on blood pressure, the change may be due to changes in diagnosis and practices for coding cause of death. If past standardized mortality rates for CVD, cerebrovascular disease and diabetes are arithmetically projected to 2025, the target of a 25% reduction of mortality from NCDs will be met; however, achievement of this target is questionable if the targets for the above-mentioned health risks are not met.

Fig. 1.9. Burden of disease attributable to 15 leading risk factors in 2010, as a percentage of Estonian disability-adjusted life–years



Source: Institute for Metrics and Evaluation (2014).

2. Coverage of core noncommunicable disease interventions and services

This section addresses the coverage of core population interventions, for tobacco, alcohol and nutrition, and individual services, for CVD and diabetes, which are closely linked to improving NCD outcomes (Table 2.1). The interventions and individual services listed are evidence-based, have a high impact and are cost–effective, affordable and feasible for use in a variety of health systems. They are linked to the *Global action plan for the prevention and control of noncommunicable diseases 2013–2020* (WHO, 2013) and the *Action plan for the implementation of the European strategy for the prevention and control of noncommunicable diseases 2012–2016* (WHO Regional Office for Europe, 2012). The assessment teams evaluated each service on a three-point scale (limited, moderate and extensive); population interventions could not be scored because of lack of information, and only an overview of the findings is presented. The criteria for scoring were devised by WHO and can be found in the Assessment guide (WHO Regional Office for Europe, 2014a).

Table 2.1. Core population and individual services for NCDs

Population interventions	Individual services
Anti-smoking interventions (WHO Framework Convention on Tobacco Control • Raising tobacco taxes • Smoke-free environments • Warnings on the dangers of tobacco and smoking • Bans on advertising, promotion and sponsorship • Quit-lines and nicotine replacement therapy*	**CVD and diabetes** • Risk stratification in primary health care (PHC) • Effective detection and management of hypertension • Effective primary prevention in high-risk groups • Effective secondary prevention after acute myocardial infarction (including aspirin) • Rapid response and inpatient care for patients after acute myocardial infarction and stroke*
Interventions to prevent harmful alcohol use • Raising taxes on alcohol • Restrictions or bans on advertising and promotion • Restrictions on retail availability of alcohol • Regulated minimum purchase age, with enforcement* • Tolerated blood alcohol level for driving*	**Diabetes** • Effective detection and general follow-up* • Patient education on nutrition and physical activity and on glucose management • Hypertension management among diabetes patients • Screening for and management of complications
Interventions to improve diet and physical activity • Reducing salt intake and salt content of foods • Virtually eliminating trans-fatty acids from the diet • Reducing free sugar** intake* • Increasing intake of fruit and vegetables* • Reducing marketing pressure on children to consume food and non-alcoholic beverages* • Promoting awareness about diet and physical activity	

*Interventions and services added to the list in the Global Action Plan to ensure comprehensive assessment
** Free sugars are monosaccharides (such as glucose and fructose) and disaccharides (such as sucrose and table sugar).
Source: WHO Regional Office for Europe (2014a).

2.1 Population interventions

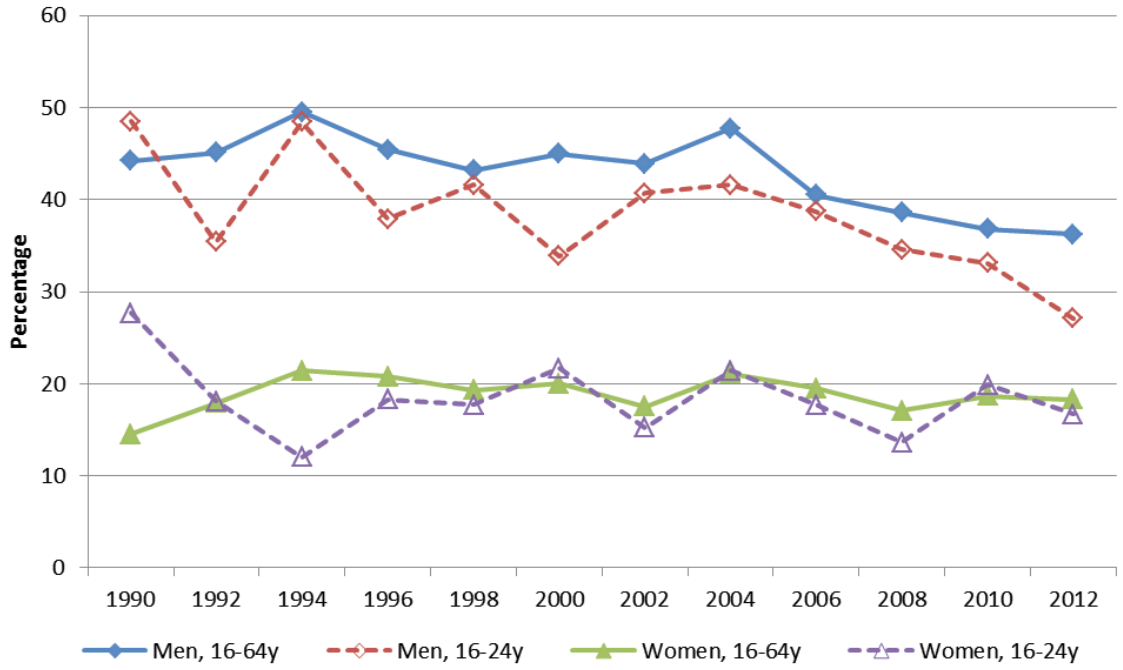
Estonia has made progress in using many of the core population interventions for NCD prevention. Further action is needed, especially in the areas of diet and physical activity and in improving coverage of hard-to-reach population groups. The main focus of population interventions in Estonia has been on tobacco and alcohol, and less attention has been paid to diet and physical activity. The National Health Plan (NHP) 2009–2020 provides the main policy directions for population interventions (Ministry of Social Affairs, 2008). As the NHP represents policy at the highest level of the health system, targeted policies are needed for implementation of the main policy directions. A first step was the publication of "green papers" on alcohol and tobacco, which were adopted by the Government in early 2014. A green paper on diet and nutrition is being prepared. The green papers provide more detailed ideas than the NHP, but it is not clear when the "white papers", which define actions, will be issued. As discussed below, the NHP also requires strengthened coordination and accountability mechanisms in order to ensure implementation of the planned activities. As discussed above, inequality has been seen mainly in health behaviour and health outcomes; this is a direct indication that interventions should be better targeted to specific population groups, and coverage of hard-to-reach population groups should be a priority.

2.1.1 Tobacco

Interventions for tobacco control have progressed well, especially tobacco taxation; however, other core interventions, such as enforcing smoke-free environments, require strengthening (Table 2.2). Taxes make up a considerable part of the retail price of packets of cigarettes, most advertising restrictions are in place, warning labels are used, and smoking is partly prohibited in public places. The Estonian Government adopted a green paper on tobacco in 2014 and prepared an action plan for implementation. Various steps have been taken to reduce the prevalence of smoking in Estonia. Taxes on tobacco have been increased several times since 2008 and currently represent 76% of the retail price. By 2016, the tax on pipe tobacco will be increased by 5%, and the minimum tax on cigarettes will be increased by an additional 20% for one tax component, with a slight reduction in a second tax component linked to the maximum retail price; there will be no tax increase on cigars. In 2017 and 2018, taxes on all tobacco products except cigars will be increased again by 5%. No clear policy has been issued for changing the tobacco tax in the long term.

A totally smoke-free environment is enforced in schools but not in hospitals, workplaces or the hospitality sector, where smoking rooms are still allowed. The warning labels on all tobacco products take up at least 30% of the package (front and back). Advertising is banned, but product placement in shops is still a problem, as the industry claims that product placement is intended for consumer information rather than advertising. Cessation services are available and are provided in hospitals and in a few PHC facilities; however, they have been funded recently by donor programmes and not from regular Government or health insurance budgets. Coverage of these services could be improved. No information was available on the effectiveness and outcomes of these activities at population level. Nicotine replacement therapy is available from pharmacies, although individuals must pay for it, representing a potential financial barrier for low-income groups. As shown in Fig. 1.5, the prevalence of smoking has increased among women with the least education and has not decreased among men with the least education or among women with the most education. Overall, the prevalence of smoking decreased among men, especially in younger age groups, while it remained stable among women (Fig. 2.1). Thus, the current smoking policies appear to be less effective in discouraging women from smoking. Countries should consider implementing targeted, gender-specific policies that take into account socioeconomic factors.

Fig. 2.1. Proportions of daily smokers among men and women aged 16–64 and 16–24 years, 1990–2012



Source: NIHD (2014).

The "score-card" of the country assessment team with respect to population-based anti-smoking interventions in Estonia is shown in Table 2.2. The scores are based on the criteria listed in Annex 2, which are derived from international evidence.

Table 2.2. Estonian score-card for population-based anti-smoking

Intervention	Rating	Basis for rating
Raise tobacco taxes	Extensive	Tax is > 75% of the retail price.
Ensure smoke-free environments	Limited	100% smoke-free environment enforced in schools only
Issue warnings on the dangers of tobacco and smoking	Moderate	Warning labels that cover ≥ 30% of package size (front and back) required on all tobacco products
Ban advertising, promotion and sponsorship	Moderate	Ban on direct and indirect advertising and promotion, but with "grey areas" regarding product placement
Provide quit lines and nicotine replacement therapy	Moderate	Free-of-charge cessation services available; nicotine replacement therapy available at full cost to the individual

For full scoring criteria, see Annex 2.

2.1.2 Alcohol

Overall, the policies to prevent harmful use of alcohol are not sufficient in Estonia. Legislation and enforcement of tolerated levels of alcohol when driving are strict and in line with international recommendations; however, there is no clear mechanism for increasing alcohol taxation, there are only partial restrictions on advertising, and enforcement of restrictions on the minimum drinking age is not sufficient. The Estonian Government

adopted a green paper on alcohol in 2014, and interviewees reported that a white paper would be prepared for implementation. Various steps have been taken to reduce alcohol consumption in Estonia. Taxes on alcohol have been increased several times since 2008, and there is a clear plan to increase them by 15% in 2015 and by 10% annually between 2016 and 2018. These tax increases are not, however, linked to the price index or changes in the affordability of alcohol. An increase in affordability was the main reason for the increase in consumption up to 2007 (see Fig. 1.6), when Estonia became one of countries with the highest alcohol consumption per capita. In addition, cross-subsidization of alcohol products is allowed, no minimum price is set for alcoholic beverages, and there are no special taxes on products attractive to young people.

The regulatory framework on the content and volume of marketed alcohol is not comprehensive. For example, alcohol advertising is allowed on television during evening hours, and alcohol manufacturers are allowed to sponsor cultural and sporting events. The content of advertisements is largely unregulated. Moreover, enforcement of marketing restrictions is limited. The availability of alcohol is restricted in terms of the times for sale in retail outlets (banned between 22:00 and 10:00) but not in terms of the place of sale; for example, sales of alcohol are allowed in Government and educational institutions after extracurricular activities and at cultural and sporting events. The minimum purchase age for alcohol is 18 years, which is weakly enforced; as a result, the average age at first use of alcohol in 2010 was 11.9 years, and the age at first drunkenness was 12.5 years (NIHD, 2014). The blood alcohol content tolerated for driving is well regulated, at 0.2 g/L and at 0 for learning and professional drivers, and is relatively well enforced, with roadside breath testing. This activity could be further strengthened, as driving under the influence of alcohol is still prevalent.

There is currently no system for treating alcohol dependence, but one is planned. Steps have also been taken for early identification of harmful and hazardous alcohol consumption in PHC facilities, but coverage is still low and the coverage and volume of brief interventions and other activities is even lower. The reasons for low coverage of brief interventions probably include minimal training, few trained individuals and lack of follow-up for this intervention by e.g. treatment.

Table 2.3 shows the score-card of the assessment team for population-based interventions to prevent harmful alcohol use.

Table 2.3. Estonian score-card for population-based interventions to prevent harmful alcohol use

Intervention	Rating	Basis for rating
Raised taxes on alcohol	Limited	Alcohol taxes have been raised but do not follow the price index.
Restrictions or bans on advertising and promotion	Limited	A partial regulatory framework exists to regulate the content and volume of alcohol marketing.
Restrictions on retail availability of alcohol	Limited	No regulatory framework exists for serving alcohol in Government and educational institutions.
Minimum purchase age regulated and enforced*	Moderate	The minimum age for consumption of all alcohol products is 18 years, but enforcement is weak.
Tolerated blood alcohol content for driving*	Extensive	Maximum of 0.2 g/L, and 0 for learning and professional drivers

For full scoring criteria, see Annex 2.

2.1.2 Nutrition

While the Government of Estonia has stated its commitment to improving nutrition in a draft green paper, implementation of the core population-based nutrition interventions has been limited. Estonia does not have a national salt-reduction initiative, no data on population-

level intake and no specific strategy for food reformulation. The public has been informed about reducing salt intake, with a national online campaign led by the NIHD. The visibility and coverage of the issue could be improved, especially for disadvantaged population groups. Limited action has been taken to reduce the marketing of foods high in fat, salt or sugar, with only limited or partial implementation of WHO recommendations. There are no limits on the trans-fat content of food, and no surveys have been conducted to determine population-level intake or the current trans-fat content of popular food products. Moderate action has been taken to promote fruit and vegetable consumption; the NIHD has conducted social marketing campaigns of the "five-a-day" message annually since 2010 and participates in the European Union "school fruit scheme". As the green paper on nutrition is developed, it should include internationally recommended policies to halt increases in overweight and obesity in Estonia (Fig. 1.7) and reduce dietary risks to health.

Table 2.4 shows the score-card for population-based interventions to improve diet and physical activity.

Table 2.4. Estonian score-card for population-based interventions to improve diet and physical activity

Intervention	Rating	Basis for rating
Reduced salt intake and salt content of foods	Limited	There is no evidence that salt intake has been reduced.
Virtual elimination of trans-fatty acids from the diet	Limited	There is no evidence that the trans-fat content of diets has been significantly reduced.
Reduced free sugar* intake	Limited	The aim to reduce the intake of free sugars* is mentioned in policy documents, but no action has been taken.
Increased intake of fruit and vegetables	Limited	The aim to increase consumption of fruit and vegetables is in line with the WHO/FAO recommendations of at least 400 g/day; some initiatives have been taken to that effect.
Reduced marketing pressure on children to consume food and non-alcoholic beverages	Limited	Marketing of food and beverages to children is noted as a problem but has not been translated into specific Government initiatives.
Promotion of awareness about diet and activity	Limited	Personnel have not been trained to address nutrition or physical activity; these are not priorities in primary care.

For full scoring criteria, see Annex 2.
* Free sugars are monosaccharides (such as glucose and fructose) and disaccharides (such as sucrose and table sugar).

2.2 Individual services

Estonia has made good progress in creating a strong PHC system; however, early detection and proactive management of hypertension and diabetes should be strengthened. The progress in core individual services described below is derived from interviews with primary care practitioners and informants in the Ministry of Health and the EHIF. A score-card was not completed, as insufficient quantitative information was available to score the services listed in the Assessment guide (WHO Regional Office for Europe, 2014a).

2.2.1 Early detection of cardio-metabolic conditions

Interviewed practitioners reported that cardio-metabolic risk was undiagnosed in many individuals (especially men) in their practice, and late diagnosis was not unusual. A study on the

prevalence of hypertension confirmed this impression and found that 36% of the participants had high blood pressure; about 80% were aware of their condition (77% of men and 87% of women), but only 40% reported taking anti-hypertensive medication (42% of men and 38% of women) (Kaldmäe et al., 2014). Although the study had a small sample and its results should be confirmed, the level of awareness is encouraging and demonstrates a well-functioning PHC system; however, adherence to medication should be improved. Outreach should be strengthened to encourage asymptomatic patients to go for health checks and to improve adherence of patients to evidence-based interventions.

2.2.2 Cardio-metabolic risk assessment and management of hypertension and diabetes

A stratified approach to the management of patients with chronic conditions and intensive disease management, especially of high-risk patients, is effective, but a more systematic approach, with stronger monitoring, appears to be required. Systematic stratification of patients by cardiovascular risk allows a prioritized approach to disease management, with proactive follow-up of high-risk patients. In principle, nurses are expected to assess cardio-metabolic risk in Estonia as part of patient triage in PHC facilities, while family doctors can refer high-risk patients to specialist services. The assessment team could not confirm the proportion of patients in PHC who undergo comprehensive cardio-metabolic risk assessment; this information would be useful for future monitoring and decision-making. The approach is not, however, uniform, and there are no visual aids or computer-based decision algorithms to facilitate diagnosis and clinical decision-making. With desktop software, individual test values can be examined case-by-case, but it is difficult to obtain an overview of a patient's status over time and in relation to health behaviour, cardio-metabolic risk, treatment decisions and other factors.

The "quality bonus payment" mechanism of PHC practices in the EHIF provides incentives and also provides information about the level of coverage of some preventive and disease management services. Of the 27 indicators of service coverage of chronic conditions (CVD, hypertension, type 2 diabetes and post-acute myocardial infarction), 24 improved significantly, from about 50% before introduction of the programme to 70–80% in 2012 (See Challenge 8), indicating good progress in disease management. Nevertheless, most of the indicators are procedural, such as the delivery of tests (glucose, cholesterol), rather than of preventive services (e.g. foot and eye examinations for diabetes) or improving adherence.

2.2.3 Counselling and patient activation

All the interviewees emphasized the importance of providing information and counselling patients on health-related behaviour (such as tobacco and alcohol use, body weight, nutrition and physical activity). Activities were reported to be offered to high-risk groups for disease prevention (primary prevention), for early detection of disease (secondary prevention) and to prevent severe disease and complications during medical treatment (tertiary prevention). While the general concepts were well accepted, concern was expressed about the quality of individual preventive services in the health system. In the case of diabetes, for example, prevention is conducted at PHC facilities and also at hospitals by nurses, who discuss nutrition, physical activity and management of the disease with patients; however, there is no clear procedure or criteria for referring patients to hospital-based diabetes nurses, who are not present in all hospitals. Furthermore, there is no system by which diabetes nurses can follow up patients, and their work is not linked to the disease management activities at PHC facilities. A more systematic approach to preventive activities is therefore required, including better coordination of preventive activities at different levels of care, better integration of prevention into medical and nursing education at all levels and strengthened skills (especially at PHC facilities) to use more patient-centred, patient-friendly approaches.

3. Health system challenges and opportunities to scale up core interventions and services

In this section, health system features that influence control of NCDs are reviewed. Fig. 3.1 gives a summary of the common features.

Fig. 3.1. Common health system features for NCD control

Political commitment to NCDs	Explicit priority-setting approaches	Interagency cooperation	Population empowerment
Effective model of service delivery	Coordination across providers	Regionalization	Incentive systems
Integration of evidence into practice	Distribution and mix of human resources	Access to quality medicines	Effective management
Adequate information solutions	Managing change	Ensuring access and financial protection	

Source: WHO Regional Office for Europe (2014a).

Challenge 1: Political commitment to NCDs

While there is political commitment to improving health in Estonia, NCDs are not mentioned specifically enough in national policy documents. The NHP 2009–2020, which is the overarching health policy for Estonia, mentions the main risk factors but does not address outcomes or individual core services for NCDs. No other policy documents specifically address NCDs, and a previous strategy for CVD prevention was ended prematurely. Coordination of joint action in the NHP and monitoring and evaluation of results could be strengthened.

Health is explicitly mentioned in national policy documents. Health is explicitly mentioned in the national development strategy, "Estonia 2020", particularly with regard to productivity, giving some indication that health is a priority for the Government. The NHP 2009–2020 guides all activities in the health field, including prevention and care of NCDs. It is a Government strategy, with annual plans linked directly to the State budget. The NHP covers five areas: social cohesion and equal opportunities; safe and healthy development of children and young people; healthy living, working and learning environments; healthy lifestyles; and health care.

NCDs are addressed in the NHP by their risk factors: a chapter on healthy lifestyles has subsections on nutrition, tobacco, alcohol and physical activity. NCDs are also integrated into other sections, including the prevention of chronic disease and their risk factors in children and young people (although "chronic disease" is not mentioned explicitly) and the problem of high out-of-pocket expenditure for health care, mainly for chronic diseases in low-income

groups. NCDs are also mentioned in the NHP action plan, as follows: "[C]ontinued provision of available and high-quality PHC services with increased provision of health promotion and disease prevention activities and monitoring of patients with chronic diseases in PHC." Discussions with staff of the Ministry of Social Affairs indicated that other ministries see health as a Government priority, but the importance of NCDs among competing health priorities is unclear.

In regard to monitoring, **NHP targets and indicators are partly aligned with the NCD Global Monitoring Framework.**[1] The alignment is strongest for generic indicators of mortality from CVD, alcohol consumption, tobacco use, overweight and obesity; however, many other indicators of the NCD Global Monitoring Framework are not covered in the NHP, such as energy intake from saturated fatty acids, mean population salt intake per day, the prevalence of episodic heavy drinking, the prevalence of raised blood glucose and the prevalence of raised blood pressure.

The NHP lists the main NCD risk factors but not the outcomes or individual services. While coverage of NCD risk factors is relatively extensive, NCDs themselves are mentioned only briefly. The chapter on health care does not make reference to core individual services, such as early detection of chronic conditions, cardio-metabolic risk assessment and disease management. Ideally, NCDs would be featured in the section on health care in the current NHP.

The country's alcohol and tobacco policies are supported by green papers adopted in 2014; a green paper on nutrition is being prepared. An integrated NCD strategy was previously available in Estonia, which was a national strategy for CVD prevention, with integration of prevention of the diseases and their risk factors (including tobacco consumption, nutrition and physical activity) with selection, provision and coordination of health care services and local capacity to take action on CVD. This strategy was planned for 2005–2020 but was ended prematurely after adoption of the NHP. This type of strategy would complement the NHP, providing a comprehensive approach to NCDs that includes all the objectives, from prevention to health care.

The NHP is an example of the health-in-all-policies principle. It is coordinated by the Ministry of Social Affairs, while other institutions are responsible for many activities in addition to Ministry of Social Affairs. For example, the promotion of physical activity is coordinated by the Ministry of Culture, and the Ministry of Internal Affairs develops and coordinates policy on use of illicit drugs and drug addiction. Policy and coordination for the promotion of physical activity were based on a "sports for all" programme in 2011–2014 and the national "Sports 2030" strategy of 2015. The Ministry of Social Affairs is the responsible coordinator for nine activities in the area of nutrition, the Ministry of Agriculture for seven activities and the Ministry of Education and Research for one activity. With regard to alcohol consumption, the Ministry of Social Affairs is responsible for seven activities, the Ministry of Internal Affairs for three, the Ministry of Justice and the Ministry of Economic Affairs and Communications for two activities each, and the Ministry of Finance for one. This pattern of shared responsibility is similar for other topics.

For the annual NHP action plan, the Ministry of Social Affairs compiles inputs from all responsible institutions, with budget projections. Numerous sections of the NHP action plan describe the basic provision of health care services and appear to correspond to the general budget lines of different institutions (e.g. overall financing of PHC by the EHIF). In addition, coordination of several areas has been handed over to other institutions, and separate activities are not integrated into a comprehensive NCD policy in the NHP. The Ministry of Social Affairs should be more proactive in coordinating activities in the area of NCDs in order to form a more comprehensive approach.

The Ministry of Social Affairs evaluates implementation of the NHP in the basis of indicators; other institutions are not involved, and other data are not included or

[1] http://www.who.int/nmh/global_monitoring_framework/en/.

analysed. Hence, the evaluation system constitutes monitoring rather than an in-depth evaluation. Reports on indicator results are sent to the NHP steering group, which consists mainly of representatives of the institutions that undertake the activities covered in the NHP. The steering group could have a more substantive role in improving the coherence of the NHP. The existence of such a group provides an opportunity to ensure the accountability of the institutions implementing the NHP; however, this opportunity is not fully exploited, as there are no principles or procedures for making the institutions accountable to the public, and insufficient time has been allocated for discussion and analysis at the steering group meetings.

Challenge 2: Explicit priority-setting

While NCDs can be prevented by addressing their risk factors, the NHP does not include health system actions for a comprehensive NCD policy. In addition, the activities described in the NHP are not detailed enough for reasonable implementation. The principles for setting priorities should be defined more clearly, and the budget allocations for different areas should be more strategic.

Estonia has made excellent progress in preparing and regular updating an NHP that identifies the country's overall health goals—longer, healthy life expectancy—**and the five strategic objectives required to achieve those goals.** The current plan, issued in 2008 and updated in 2012, covers the years 2009–2020. It was prepared from input obtained during lengthy consultations and public debates (Lai et al., 2013), which established both the health goals and the values on which the strategic objectives, sub-objectives and associated activities are based. In addition, the plan contains analyses of health trends and the main sources of Estonia's disease burden, which it intends to address.

For each of the five strategic objectives, the NHP provides an analysis of the main issues to be addressed, proposed activities and measurable indicators and targets. The proposed activities are directly linked to the State budget, which itself is based on a 4-year strategy prepared by the Ministry of Finance (Lai et al., 2013). Activities are also recommended for other stakeholders, such as municipal governments, the private sector and the population (Ministry of Social Affairs, 2008).

Although resources are ostensibly allocated on the basis of explicit priorities and the burden of disease, this goal has not been fully achieved. The NHP does not present the relative importance of the five strategic goals, which can only be inferred from the budget allocations. As the method or criteria used to make allocations are not described, it is not possible to determine whether the allocations truly reflect the stated priorities, nor is it clear whether the proposed allocations are sufficient to achieve the stated goals and objectives. The budget allocations would appear to indicate that achieving a healthy lifestyle (area IV) is the least important priority, while it should be one of the most important priorities for achieving the overall goals of increasing overall healthy life expectancy. A healthy lifestyle determines the incidence and prevalence of NCDs, which make up the bulk of the disease burden.

As the main NCDs are not mentioned in the NHP, it is difficult to determine what resources should be allocated to activities for improving the capacity of the Estonian health system to diagnose and manage patients with NCDs appropriately. One such activity, for example, would be to establish or extend educational programmes for ancillary health professionals such as dieticians and therapeutic patient educators. The absence of any reference to NCD diagnosis and management also precludes the establishment of specific goals, indicators and targets for achieving the overall health goals. Thus, institutions under the jurisdiction of the Ministry of Social Affairs and PHC service providers and hospitals are not obliged to include disease-specific objectives and activities in their strategic development plans; they are therefore not held accountable for the results.

Challenge 3: Interagency cooperation

The NHP and its inter-sectoral steering committee could be used to ensure more strategic and operational cooperation, but clear accountability mechanisms should be in place and enforced. Cooperation among health sector institutions could be improved by clarification of responsibilities and greater accountability.

Multi-sectoral or whole-of-government action could be mobilized for NCD prevention and care management. The NHP is perceived as the window on the activities of the Ministry of Social Affairs and its partners, and other sectors are showing greater interest in health. This indicates a true opportunity, which should not be wasted but rather capitalized upon under the leadership of the Ministry of Social Affairs.

The NHP is overseen by a cross-sectoral, inter-institutional committee. The NHP summarizes all health-related activities in Estonia, as it also includes the health-related activities of other sectors. The responsibility for implementing non-health sector activities lies with the ministries that prepared the source strategies; however, as the NHP is a high-level strategy, the activities are presented in a general format or as main areas of action, so that many activities are not reflected, especially in health care. Staff at the Ministry of Social Affairs commented that there would be no consequences for other ministries if they did not meet their commitments. This is a clear example of a lack of accountability. Similarly, there is no accountability to Parliament for implementation of the NHP, for example via the Social Affairs Committee.

It is not immediately clear whether the existing relations are good and sufficient for effective cross-sectoral work on NCDs. In the case of nutrition, for which competence is shared, the Ministry of Social Affairs might wish the Ministry of Agriculture to assume some activities (e.g. surveys of salt intake) but has no means to effect this. In addition, planning of activities is not optimal; for example, the first national dietary survey since 1997 was planned without allocating funding for a concurrent survey of salt intake. Other ministries have used health to justify their own activities or policies: for example, the Ministry of Finance used health as a justification for increasing taxes on tobacco and alcohol but only when it suited them for the purpose of raising revenue.

The Ministry of Social Affairs has no binding mechanisms to ensure implementation of health-related activities agreed in the NHP for other sectors, and the NHP itself has no real power in other sectors. Budget restrictions limit cross-sectoral collaboration, and it is difficult to obtain funds for activities outside the responsibility of the ministry. As the Ministry of Social Affairs appears to be neither capable nor willing to transfer funds to other ministries, each must find its own resources. There is also no possibility of shared budgeting among ministries, institutions and departments, although this would provide a financial incentive for greater collaboration and shared responsibility. Thus, every department and institution currently works in a silo.

Difficulty in collaborating with other ministries was reported to be a barrier to introducing regulations. In the absence of strong incentives for cross-sectoral collaboration, the strategy chosen by the Ministry of Social Affairs is to use international evidence to inform partners about the issues, so that they can take action themselves to improve population health. It was reported, however, that other ministries often did not accept the arguments presented and favoured emotional and personal arguments. The attempts to create collaboration through information-sharing appeared to be sporadic and motivated by the activities of individuals, rather than being systematic or institutionalized through the NHP steering committee.

The cross-sectoral steering committee appears to be unable to overcome opposition from other ministries and from economic operators, thus undermining the possibility of a whole-of-government response to NCDs in Estonia. Although the Ministry of Social Affairs

should give guidance, it is not perceived as a leader in the field, for various reasons (e.g. high turnover of personnel).

Collaboration between the NIHD and the Ministry of Social Affairs is frequent but could be closer or better coordinated. During the assessment, examples of close cooperation were found—in the field of nutrition policy, for example—but the NIHD could more effectively lay the groundwork for policy development. For example, significant gaps were identified in anthropometry (body weight and composition), surveillance of risk factors, socioeconomic factors and policy monitoring. It was not clear when the NIHD would provide support or input to the Ministry of Social Affairs on policy development and whether the input would be technical (e.g. research information), managerial (e.g. management of NCD programmes), in the form of policy development or a combination of these. Currently, collaboration appears to be ad hoc, by personal communication, with no clearly defined institutional responsibilities, collaboration procedures or division of tasks between the Ministry of Social Affairs and the NIHD. This ambiguity in roles, procedures and responsibilities also applied to the relations of the Ministry with other institutions under its supervision.

The organizational structure of the NIHD might be a barrier to effective collaboration. The NIHD has many departments with related responsibilities (e.g. for chronic diseases, NCD prevention, health promotion and oncology), so that it might be difficult to use all the technical potential of the NIHD in collaboration with the Ministry of Social Affairs.

No single institution in Estonia is responsible for the overall coordination and supervision of NCD activities. While the NIHD can be assumed to bear this responsibility in view of the existence of a chronic disease department and extensive work on behavioural health risks, it actually focuses only on primary (and some secondary) prevention in NCD control. Although the NIHD maintains the national registries on cancer and causes of death (among others), it does not cover the full scope of NCD control activities. Thus, the mandate, responsibilities, resources and accountability mechanisms of the NIHD should be reviewed to determine whether it (or another institution) should take on the role of overall coordination of NCD actions in Estonia.

There is some consultation with external stakeholders on policy development, such as for nutrition, but it is sporadic. For example, associations representing the food industry have been invited to join consultations for preparation of the new green paper on nutrition, but some professional health associations (e.g. the Society of Cardiologists) and disease-specific groups (e.g. the Diabetes Association) were not consulted, despite expressions of interest. This is problematic, given that significant opposition to the green paper has been reported from the food and alcohol industries. Cooperation with more public-interest groups could strengthen the Government's position.

Civil society organizations appear to be rather weak. These organizations provide information and outreach to the population at local and regional levels but are not strongly active in consultation or lobbying at national level, with the possible exception of a nongovernmental organization that addresses alcohol issues. Patient associations are consulted in round-table discussions (such as for diabetes) but not frequently; they must request consultations from the Government. The Ministry of Social Affairs should establish channels for active, regular dialogue with civil society groups to discuss concerns about policy development and needs and effective policy implementation and service delivery.

The NHP contains indicators and targets, but no concrete examples were given of how these have resulted in new actions. Hence, while the NHP steering mechanism provides a strong basis for joint cross-sectoral action, more discussion is recommended to ensure that it is used to its full potential. At present, the mechanism is used mainly to share outlines of planned activities within the budget ceiling, which are integrated into the plan accordingly. An interagency working group should be organized to review the plan, look for synergies and gaps, be aspirational and request funding outside the set budget for future action and to improve current activities.

Given the focus on short-term action plans, implementation plans and green papers, a conscious effort is needed to ensure that the available data are analysed rapidly and translated into specific, time-bound goals. Baseline data are clearly required to support planning, and the results of policy monitoring and evaluation should be made available so that the implementation plans address areas in which more action is needed. While in Estonia large amounts of data are collected regularly, much of the data are not analysed or are used only for basic analyses; hence, little analytical evidence is available for policy development. The existing data sources are not analysed comparatively; this is essential to identify issues and thus improve the scope and quality of the collected data. This could be addressed directly by better cooperation between agencies for the collection and analysis of data.

Challenge 4: Population empowerment

Population health literacy could be improved in Estonia. Patient organizations could play a larger role, but this would require both capacity-building and further resources so that they could become equal partners with medical specialists. Furthermore, training doctors in teamwork and management skills will not only create a motivating work environment but can also realize the potential contribution of nurses to patient education and empowerment.

The health literacy of the population of Estonia is built mainly by producing leaflets and by campaigns for the general public. It was reported that many patient leaflets are provided by the pharmaceutical industry, with no check on the quality of their content or whether the messages in leaflets from different sources conflict. The EHIF has also prepared a number of patient leaflets and other information material, and the NIHD provides material on health behaviour to the general public and certain risk groups. Whether these constitute a clearly defined, comprehensive patient information programme is unclear. The materials are nevertheless available to improve health literacy and to empower citizens to take responsibility for their own health and to claim their entitlements within the health system. The information is available in both Estonian and Russian but is not necessarily comprehensible for people with lower levels of education.

The EHIF and the NIHD conduct public campaigns, including advertising on television, radio and billboards, articles in newspapers and use of social media. An example of a successful campaign by the EHIF, which was noticed by many people, is one on the role of the family doctor in the community. The main message of the campaign was: "[T]he solution for your health problem starts with your family doctor and nurse." The campaign recommended concrete actions to be taken, explaining where to find help. The campaign was evaluated to determine whether special target groups should have been included, as it did not target the population groups known to mistrust medical doctors the most (such as Russian-speaking working-age men living in Tallinn); however, specific attention was paid to Russian speakers in eastern Estonia, where part of the campaign was in Russian. The evaluation indicated that, first, the trust of the general public toward PHC should be improved, and only then should targeted interventions be considered. The aims of NIHD campaigns to promote healthy nutrition, fruit and vegetable consumption and reducing harmful use of alcohol were to raise awareness and give practical suggestions for behaviour change. The campaigns have defined target groups and are evaluated before and after implementation as standard practice.

The support that patients with diabetes, hypertension and other NCDs receive for dealing with their conditions in everyday life could be improved. Patients are trained in using medical equipment, and personnel in education facilities are trained in providing support to children with diabetes. Camps for children are being organized, and books and leaflets are available in Estonian and Russian, but there are few courses for meal planning and cooking, and overall funding is too low to cover the needs of all patients. There is also no follow-up of interventions.

Funding support to patient organizations in Estonia is insufficient for the development of strong, sustainable organizations. Currently, most patient organizations function on a project basis; thus, in order to obtain funding, they must have a short-term project, and they compete

for funding with all other nongovernmental organizations in the health sector. In addition, the grants are reported to be small, and many projects last for < 1 year. European Union grants are used to fund the activities of patient organizations. This project-based approach means that, in addition to precarious funding, new topics must be presented in new applications, so that the results of projects are often not used.

The engagement of patient organizations could be strengthened. Round-table discussions on health topics are organized between patients, doctors, the Ministry of Social Affairs, the EHIF and others, to promote ideas and obtain feedback from stakeholders in the health care system. It has been difficult, however, to involve both doctors and patient organizations in guideline development panels in the same manner; thus, patient organizations could be better prepared to engage with doctors on an equal basis. Patient focus groups, which are well attended, have begun an initiative to prepare patient guidelines to accompany clinical guidelines. The role of patient organizations in multi-stakeholder boards of health sector organizations should also be strengthened; this will require strengthening the patient organizations themselves.

Stigma is perceived as a problem, although discrimination on the basis of a disease is illegal in Estonia. Some patients do not want anyone to know that they have a disease. Occupational therapists are not allowed to cite a diagnosis in case summaries for employers. If a person has been on sick leave for 4 months consecutively, the employer can terminate his or her contract, although sick-leave pay continues.

Every module of the curriculum for nurses alerts them to pay attention to the educational level and background of patients and to apply different teaching methods. From the first year of training, doctors are also taught how to address health problems in people at different levels of society. For example, there is discussion on the importance of patients' background in determining the likelihood that they will show up at the clinic, accept their diagnosis and adhere to treatment.

Both doctors and nurses feel respected and valued by patients, and most nurses also feel respected by doctors (especially in family medicine) and consider themselves to be specialists. What patients can expect of nurses is not always clear, and some patients will take advice only from doctors, but the role of nurses appears to be increasingly appreciated. Nurses also report that collaboration between doctors and nurses is good in general, especially in PHC. Whether such communication is completely open depends on the individuals, the situation and the organization in which they are working. Nurses are perceived as being under heavy pressure, with a heavy workload.

Doctors should be trained in teamwork and management skills and in creating a motivating work environment. During the interviews, nurses stated that high-quality services can be delivered only when there is trust and teamwork and when nurses are given responsibility. However, few organizational procedures or specific initiatives have been made to improve collaboration between nurses and doctors or to improve teamwork more generally. Nurses have proven to be highly capable of taking responsibility. Family nurses are being granted the right to prescribe certain drugs, once trained; midwives already have this right. Doctors should also be trained in management skills in order to make family practices positive, motivating working environments for delivering services. The capacity of nurses for patient education and counselling is not being used to its full potential.

Challenges 5 and 6: Effective models of service delivery and coordination among providers

Much has been done in Estonia to place PHC and family medicine at the centre of care, with links to other levels. While progress has been made, the challenges that prevent scaling up of core individual services for NCDs include lack of clarity about responsibilities at each level of care, uneven CVD risk assessment, no standardized discharge management in hospitals, no clearly defined pathways

of care, insufficient analysis of data on care management, inadequate attention to improving the quality of care and discontinuity of care between the health and social sectors. Patients must be placed at the centre of care.

Primary care is delivered for patient lists in family practices. Family doctors and nurses are the health professionals who deliver primary care in Estonia. Family doctors regard themselves as specialists and consider that the profession has a good reputation. Primary care practices are usually staffed with at least one family doctor and one nurse. Both single and group practices of varying sizes exist, the largest being primary care centres. Patient lists are linked to individual family doctors, regardless of the organizational form of the practice, and, in principle, all family doctors are private entrepreneurs, even if they have created a limited company to run a primary care centre.

The family doctor coordinates care for chronic disease in Estonia, but in practice there are challenges. Family medicine was intended to coordinate care in Estonia, hence, the requirement for referral to access specialist care, patient lists tied to practices and capitation as the main payment mechanism. In the interviews conducted during the country assessment, however, doctors reported that patients often requested referrals to specialist care only after they had already secured an appointment with the specialist. Hospital emergency rooms can also be used to bypass primary care, especially as no family medicine service is available over the weekend and outside working hours (except by telephone consultation on a national hotline). Furthermore, the gatekeeping function at primary care level is only partial, as referral is not required for some specialties (e.g. ophthalmology, dermatology, venerology, gynaecology, psychiatry). In addition, the family doctor often has only a fragmented picture of a patient's care, as there is no standardized discharge management in Estonia (discussed in detail below), and e-health services function sub-optimally (see Challenge 13). These factors prevent family doctors from playing their intended role as care coordinators.

The tasks of the family doctor include provision of PHC and counselling on prevention and care of disease, injuries and poisoning. The national guideline on prevention of CVD recommends use of the Systematic Coronary Risk Evaluation (SCORE) of the European Association of Cardiology to determine the probability that a patient will develop a CVD or have a CVD-related event and thus indicate possible counselling and treatment options. The outcome is not, however, linked to levels of care or other treatment guidelines (e.g. for hypertension or stroke). A treatment guideline on diabetes does contain a section on prevention. The quality bonus system introduced by the EHIF and the Association of Family Medicine provides financial incentives for prevention and care coordination as part of the payment mechanism for family medicine (see Challenge 8); however, the assessment showed that CVD risk is not scored systematically by a uniform approach (see section 2.2), and care decisions are based more on habitual practice. Some doctors considered that counselling was not a useful or necessary use of their time during patient appointments. As the full protocol of a motivational interview is lengthy, a shorter technique is used in practice, with a maximum duration of 20 min. When doctors were asked whether such sessions were routinely offered or were common, they answered that it depended on the practice.

People are screened for health risks and disease only opportunistically, with no invitation or recall system and not in every family medicine practice. Nurses are meant to manage the care of patients with NCDs and should thus invite them to health checks and remind them about regular visits to specialists. During the interviews, various reasons were given for this not being done, such as lack of readily available information (e.g. on when a patient was last in contact or the coverage certain patient groups should receive); lack of contact information for many patients; no automated invitation or recall system; and no time and/or resources to seek contact with patients. In Estonia, ancillary staff are not used for non-medical managerial tasks, such as care coordination.

The distribution of tasks between primary and secondary care physicians is not always clear. As for several other aspects of care, a decision on whether to refer a patient

to an outpatient specialist or for hospital care ultimately lies with a particular physician, and practices differ significantly. An example of the misaligned distribution of tasks between care levels is that some medications (such as for pulmonary diseases, especially asthma) can be prescribed only in secondary care. A new treatment guideline for asthma is being prepared, which should correct this prescription inconsistency.

Cardiologists in tertiary care considered that CVD care, and especially that of acute cases, is efficient, but hospital discharges are not managed systematically. There is no standardized discharge management to ensure that the family doctor receives the necessary information to continue a patient's care in the community (e.g. whether medication has been prescribed) or that rehabilitation is provided to all patients who need it. Hence, only 20% of stroke patients and even fewer patients who have had a myocardial infarction receive medical rehabilitation after the event.

Rehabilitation is rare, and rehabilitation services are fragmented, with barriers to the continuity of and access to care. Various types of rehabilitation are available in Estonia. Medical rehabilitation is provided mainly as inpatient specialist care and almost exclusively in cities. Access to these services requires referral, and the duration of rehabilitation reimbursed by the EHIF is limited, with cost sharing by the patient of up to 20% of the bed–day reimbursement price. There is no formal procedure for referring patients for rehabilitation, and the decision is taken by the attending physician. Group rehabilitation was reported to be uncommon; most was conducted by one rehabilitation therapist with one patient. A low level of staffing was cited as a barrier to the provision of rehabilitation services. Rehabilitation services are also provided within social care (also under the governance of the Ministry of Social Affairs) and organized by local municipalities. This type of rehabilitation is provided mainly for multi-morbid patients who no longer require acute treatment and have a certain level of disability. As for medical rehabilitation, the availability of social rehabilitation and the selection of services were reported to be limited, and the cost-sharing is even higher. Although both medical and social care rehabilitation are under the jurisdiction of the Ministry of Social Affairs, the two systems were reported to operate separately, with little collaboration and no continuity of care from one system to the other.

Social care services are regarded as critical to a comprehensive care system, but they are not well linked to health care services. With rehabilitation for disabled people, part of the remit of social services is to organize domestic services, such as help with cooking or eating, social transport, personal assistance for people with disabilities (e.g. blindness) and provision of support personnel (e.g. for children with mental disabilities). As with rehabilitation services, however, services in social and health care sectors are not coordinated or provided as a unified package as part of comprehensive care, even though the Ministry of Social Affairs is responsible for both sectors.

E-health services are intended to improve the coordination of care between service providers; in Estonia, however, this is left to market forces, with little coordination. As mentioned under Challenge 13, e-health solutions have significant potential to support and strengthen coordination among care providers. At the time of writing, however, e-services in Estonia are not integrated, owing to weak governance and coordination, as emphasized by the National Audit Office (NAO) (2014). E-services have focused on the exchange and archiving of documents, and use of data for clinical and managerial decision-making has been secondary. Submission of case summaries to the national repository has not been enforced, creating gaps in the data available.

Physicians assess performance of care management by perception rather than from data. For example, there was widespread belief among clinicians that hypertension is usually treated in primary care. According to family doctors, only 10–15% of hypertension patients are referred to secondary care. A recent study by the World Bank and the EHIF (World Bank Group, in press) showed that the burden on specialist care is higher than that assumed by family doctors: 50% of hypertension-related visits to health care institutions in Estonia are

to specialist care, while 84% of all hospitalizations for CVD are avoidable (that is, the patient should have been treated at PHC level). Similarly, various specialists estimated that 20–50% of diabetes patients are unaware of their condition; no data were available to corroborate these estimates. According to the World Bank Group (in press) 20% of specialist visits and 83% of hospital admissions for diabetes were avoidable.

Patient needs and patient health outcomes should receive greater focus. Physicians are not apprised of the health outcomes of their patients. The quality bonus system indicators are for provision of services and not for patient outcomes (see section 2.2), and family doctors have no readily accessible means for obtaining an overview of the health outcomes of individual patients and patient groups, such as with desktop software.

Quality-of-care standards are not implemented or enforced sufficiently. While the NHP envisions high-quality health care in Estonia, no single institution is responsible for ensuring quality-of-care processes and outcomes. The EHIF has taken the initiative to support health care service providers in improving the quality of care, in order to improve the use of health insurance resources. This initiative includes monitoring the quality of hospital care and publishing the results; collaborating with the University of Tartu and WHO to create a system for preparing and updating clinical guidelines; and working with the University of Tartu on a system for selecting quality indicators.

Challenge 7: Regionalization, economies of scale and specialization

The Estonian hospital sector is highly regionalized, with three levels of specialization. Hospitals at the intermediate and highest levels of specialization can also provide the services of lower level(s). A new wave of regionalization and specialization has begun at the initiative of the highest-level hospitals, which will probably result in the formation of conglomerates with lower-level hospitals. In parallel, regionalization of PHC and creation of primary care centres has begun. Further work is needed to eliminate barriers to access to specialist care for people in rural areas.

The hospital sector is divided into three levels of specialization, which will be strengthened through networking recently initiated by the largest hospitals. The current arrangement of specialization levels was created by a hospital master plan in 2000. The targets for reducing local hospitals to the lowest specialization level were not achieved, however (NAO, 2010), and the hospitals at the highest level also provide services at lower levels of specialization. According to information available for the assessment, a new round of regionalization and changes in specialization have been initiated by the highest-level hospitals, which will optimize their service provision by acquiring shares of other hospitals or by signing networking agreements with these hospitals. This move could ensure that specialist services will be provided at the "right" level, balancing access and efficiency. For example, decentralization makes sense in some cases, and some specialist services can be provided closer to patients' homes by rotation of specialists. In other cases, centralization of specialists is more appropriate to ensure good outcomes at low cost, and networks would refer patients directly to highly specialized care in the lead hospitals.

Plans exist to build PHC centres that are linked to hospitals in regional centres. The single-practitioner, family-doctor model presents significant challenges to improving outreach and patient activation and management services. PHC is also undergoing regionalization and increased specialization, and European Union funds are being used to build new infrastructure to incentivize the creation of group family medicine practices. Group practices should save costs by use of shared resources and specialist services (e.g. nurses, dieticians, physiotherapists, social workers), with greater collaboration with hospitals in the regions. While horizontal integration makes it possible to improve prevention and disease management, the general practice nature of

PHC must be maintained to respond to the increasing prevalence of multi-morbidity and to avoid over-specialization, which will invariably lead to fragmentation of care for patients.

The limited amount of hospital transport available and the lack of patient hotels are seen as barriers to specialist care, especially for patients from rural areas. Social and hospital transport is the responsibility of local municipalities, and there is no allowance or any organized transport for patients. The frequency and timing of public transport are reported to be further barriers to access to specialist care for people in rural areas. The hospitals that provide higher-level care in Estonia do not have "patient hotels" (non-medical beds for outpatients and patients' relatives in hospitals or nearby); therefore, patients—especially those from rural areas—have an incentive to access inpatient care when day treatment or use of outpatient services would be sufficient.

Challenge 8: Incentive systems

Since its establishment, the EHIF has evolved into a proactive strategic purchaser of health services, and a range of sophisticated instruments are used to improve the quality and efficiency of health care services. Nevertheless, the current provider payment mechanisms create a strong upwards pressure at system level for specialist care and hospitalization rather than providing an incentive for prevention and disease management at PHC level.

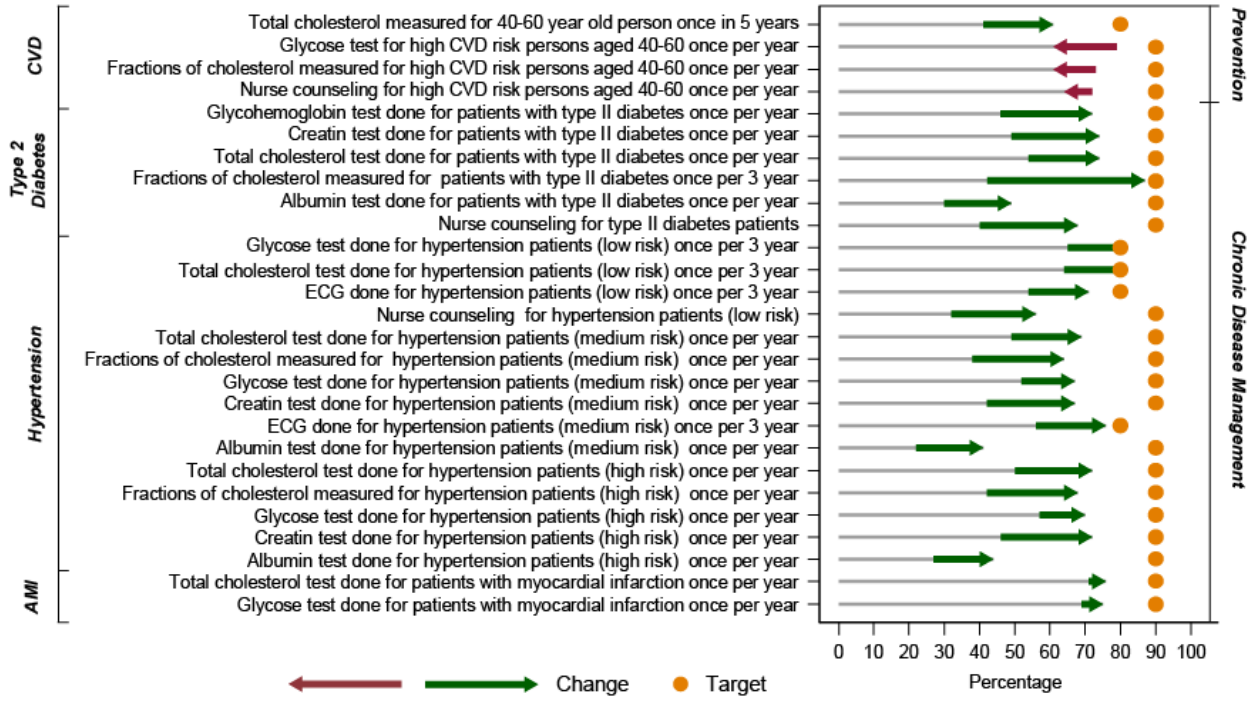
Since its establishment, the EHIF has evolved into a proactive strategic purchaser of health services, and a range of sophisticated instruments are used to improve the quality and efficiency of health care services. In PHC, a mixed approach is used to remunerate providers, with a predominance of capitation payment and a small but important pay-for-performance element. Fee-for-service payment is used for outpatient specialist care and for inpatient care in diagnostic groups. Both forms of specialist care have volume- and expenditure-capped contracts with the EHIF.

Family medicine practitioners are remunerated by a combination of age-dependent capitation payments, basic fees and fees for specific services (e.g. Pap smears). Capitation payments account for 67% of a family doctor's practice budget, fees for specific services account for 20% and quality bonus system for only 1%; the remaining 12% is derived from basic allowances (11%) and other fees (1%). Capitation payment dominates the other sources of income. These payment mechanisms are designed to motivate family doctors to take greater responsibility for diagnostic services, to reduce the need for specialist care (particularly hospitalization) and to ensure appropriate management and continuity of care for patients with NCDs (Thomson et al., 2010; Habicht, 2014).

Since 2006, there has been a well-designed pay-for-performance component for PHC, known as the quality bonus mechanism. The system began on a voluntary basis, achieved over 90% participation of family doctors by 2011 and became mandatory in 2015. The system has three performance domains, one of which is chronic disease management, with five sets of indicators for the prevention and management of certain CVDs, myocardial infarction, type 2 diabetes and hypertension (Habicht, 2014). In 2013, 52% of participating family doctors received quality bonus system payments (EHIF, 2015).

Despite its small financial contribution, the quality bonus system has strengthened disease management for patients with hypertension or diabetes or after acute myocardial infarction (Fig. 3.2). Nearly all the indicators of disease management improved, probably as a result of systematic strengthening of PHC in Estonia, including organization, payment mechanisms, guidelines and training. Three of the four indicators of prevention did not, however, improve. This may be due partly to the fact that the main incentive for family doctors is capitation, which encourages them to limit the time and effort spent in providing care or engaging in costly outreach and patient activation and to refer patients rapidly to specialist care. The high rates of referrals to specialists suggest that this is indeed a problem. The EHIF recently introduced e-consultations with specialists in order to reduce the rate of avoidable referrals, but it is too early to tell whether this incentive is strong enough to change the habits of family doctors significantly.

Fig. 3.2. Goal achievement against quality bonus system indicators, 2007–2012



Source: EHIF (2015).

Outpatient specialist care is remunerated on the basis of fees for service, which incentivizes increasing the volume up to the cap introduced by the EHIF. Volume and cost caps are an integral part of the contracts negotiated between the EHIF and ambulatory medical specialists. These fee-for-service contracts are a rich information base for ascertaining the detailed activities of outpatient specialists. Overall, the capped fee-for-service contracts are fairly effective in containing the costs of ambulatory care, but, combined with high referral rates from capitation-based PHC, they lead to long waiting times for patients. A further issue is that outpatient specialist care is provided mainly by hospitals, so that there is an incentive to refer patients to inpatient care in the same hospital in order to maximize the market share and income for the service provider.

Similarly, the payment mechanism in hospitals is based mainly on diagnostic groups, with incentives to increase the volume up to the negotiated cap. Hospitals in Estonia are paid by a combination of fee-for-service, per diem and case-based payments. All regular admissions and outpatient surgical procedures are reimbursed on the basis of diagnostic groups, which have accounted for 70% of the total payments since 2009 (Thomson et al., 2010). The incentive usually associated with use of diagnostic groups to increase the number of admissions is limited in the Estonian system by the cost and volume caps specified in the contracts between the EHIF and all the hospitals included in a hospital network development plan. These contracts also specify access to care, quality of care, reimbursement conditions and reporting requirements.

Reimbursement for inpatient rehabilitation is also capped in terms of both volume and duration of care. Inpatient rehabilitation services are reimbursed on a per diem basis, but contracts with the EHIF place a cap on the total number of days per patient in order to reduce providers' incentive to increase the average length of stay. Such limits are desirable, however, only for those patients who can be adequately rehabilitated within the imposed limits; according to the EHIF, the treating doctor can always extend a case stay when necessary. As access to outpatient rehabilitation services is extremely limited, patients who require longer rehabilitation may be discharged before they have been adequately treated; they may therefore need additional health or social services and will also be at greater risk for long-term impairment and incapacity to work. As a result, the short-term cost-containment strategies of the health insurance funds are likely to undermine long-term cost-containment (and cost–effectiveness) goals.

Overall, by continuous innovation and improvement, the EHIF has created incentives for increased productivity and quality while maintaining strong control over volume and overall expenditures. While each payment modality is a sensible approach to influencing the behaviour of providers at each level of care, they result in negative outcomes at system level. **Specifically, despite the volume and expenditure caps, the sum of these incentives creates a strong upward pressure at system level for specialist care and hospitalization rather than prevention and disease management at PHC level.**

Challenge 9: Integration of evidence into practice

Some positive developments have emerged in the area of clinical guidelines, but there are no guidelines for patient pathways. The existing guidelines that are part of the clinical desktop software and e-health monitoring tools should be used more widely. Positive developments have also been seen in the area of health technology assessment, although it is unclear how this will be funded once European Union grants expire. In general, the available data, research capacity and evidence could be used to better effect in policy development.

Treatment guidelines are devised and updated by a multi-stakeholder advisory board. The board chooses topics, appoints a panel for each topic and approves the guideline. The head of the advisory board is the Dean of the Faculty of Medicine of the University of Tartu, and the EHIF, which initiated the advisory board, provides technical support. The board consists of representatives of various national and research institutions, medical associations and patient organizations. Three to four clinical guidelines are issued each year on the basis of an evidence-based guide to the development of such guidelines (Bero et al., 2013).

National clinical guidelines exist for the treatment of the most common NCDs, but there are no guidelines for care management or patient pathways for CVD and diabetes. There are guidelines for hypertension, stroke, cardiac insufficiency and type 2 diabetes, which are both generic (e.g. for prevention of CVD) and more specific (e.g. for some care elements in PHC). There are, however, no guidelines for patient pathways through levels of care or for management of patients at different levels, which would link different clinical guidelines into a comprehensive whole. The only exception is the recently updated guideline on hypertension treatment, which includes referral criteria. Guidelines on care management and pathways could also be used to link clinical and patient guidelines, guidelines for social services and guidelines for nursing at home and in primary care.

Current guidelines on health promotion and lifestyle counselling in PHC and disease management should be reviewed. Such a review, particularly for diet and weight management, would indicate whether specific or revised guidelines are needed. At the time of writing, there are no guidelines for the provision of counselling or brief interventions in primary care, although primary care doctors mentioned screening and counselling guidelines for alcohol use and guidelines for dietary counselling by nurses as part of CVD management.

Clinical guidelines have not been integrated into the clinical desktop software, and current e-health services do not permit verification of whether care guidelines have been followed. Clinicians reported that lack of time and medical resources are the most frequent barriers to using the guidelines in everyday practice, with 42% and 32% of respondents in a recent study, respectively, listing these as barriers (Taba et al., 2012). There is no disease management programme for diabetes; however, the Association of Endocrinology has an informal disease management programme for type 2 diabetes. Integration of guidelines into clinical desktop software and an e-health tool for comparing the care provided with the clinical guidelines would encourage use of the guidelines in everyday clinical work and also improve patient care and outcomes.

A centre for health technology assessment was recently created at the University of Tartu to support the Ministry of Social Affairs and the EHIF in selecting new services for

reimbursement. The National Centre for Health Technology Assessment was established in 2012 to produce reports on topics selected by the Ministry of Social Affairs and the EHIF. The Centre's funding is currently time-limited to European Union structural funds that are channelled through a Ministry of Education and Research grant. At the time of the assessment, five health technology assessment reports had been published, and a total of 25 reports are expected by the end of 2015. The future of health technology assessment in Estonia once the grant funding ends is unclear.

Knowledge transfer and translation of evidence for use in policy-making should be strengthened. Health technology assessments are one of the bases for deciding on the inclusion or rejection of new services onto the reimbursed services list. Ensuring that practice conforms to evidence and a strong orientation to achieving good health outcomes are important governance functions, which the EHIF undertakes to some extent. Nevertheless, it is unclear how much a small country like Estonia should invest in further institution-building in this area. Knowledge transfer and translation of evidence for use in policy development should also be strengthened to maximize health outcomes with the available resources.

Most health care research is conducted at the University of Tartu; research capacity in Estonia could be improved to better analyse and use all the available data. Large amounts of administrative and survey data are collected, but only small amounts are analysed. There are many probable reasons, including data protection restrictions, little institutional data-sharing and analysis, the low level of funding for research and limited capacity to perform more than basic analyses.

Challenge 10: Distribution and mix of human resources

Estonia will face an acute shortage of health workers in the near future because of an ageing workforce, high emigration rates and insufficient training volumes to replace health workforce losses. There has, however, been no health needs assessment and no estimate of human resource needs, although there is some task-shifting from doctors to nurses (but not to ancillary staff).

The Ministry of Social Affairs lacks focus on assessing the health needs of the population and human resource needs; associations estimate the human resources required within their specialty. The interviews indicated that the Ministry of Social Affairs does not estimate human resource needs for health. While the Ministry has formal responsibility for estimating population health needs and the resulting human resources required, development plans for all medical specialities in the country until 2020 were outsourced to the specialty associations, with technical support from a think-tank. Thus, individual interested parties decided on the service volume and the human resources required. No overall assessment has been made of the proportions of various specialty services required and the human resource capacity for those specialties. The publicly available specialty development plans are very general and do not provide detailed information on, for example, the methods used for needs assessment or whether the existing service portfolio in the specialty is optimal.

There is an increasing lack of human resources for health care in Estonia due to an ageing workforce, inadequate training volumes and emigration. Annually, an average of 30 family practice patient lists become vacant, mainly because of the retirement of family doctors, and the average age of family doctors is 54 years. At the same time, only about 25 family doctors finish their residency each year and enter the workforce. Thus, at the time of the interviews, 17 of the country's patient lists were vacant, mostly in rural areas. Lack of doctors is also a problem in hospitals, especially in rural areas, where the average age of doctors is the highest; for example, one third of doctors in Rapla County Hospital and two thirds of internal medicine physicians were above retirement age.

About 140 medical students begin their studies annually. Of these, 120–130 graduate, and about one third of them emigrate immediately afterwards. According to estimates by the Faculty of

Medicine of the University of Tartu, the number of medical students should be doubled to ensure the long-term availability of doctors, and the required short-term increase required to buffer the rate of retirement in the coming years is even higher. The University of Tartu is the only medical school in Estonia and is not adequately equipped to assume such an increase in student numbers, in terms of either infrastructure or teaching staff.

The minimum increase in the annual number of nurses trained to ensure long-term sustainability was estimated to be 4.5 times by representatives of Tartu Health Care College. A large part of the increase would be to compensate for nurses who emigrate and, more importantly, for those who leave the health sector after 2–3 years of work. This high rate of resignations was reported to be due mainly to the emotional and organizational climate at the workplace, and many nurses (especially in hospitals) said they were frustrated, stressed and overworked. It was estimated that about every second nurse is lost to the Estonian health system as a result of either emigration or change of profession.

Inadequate effort has been made to expand training capacity or to alter training to meet personnel shortages. As indicated above, assessment and planning of human resources needs appears to be lacking in Estonia, and the prerequisite increase in training volumes has not been achieved. The Ministry of Social Affairs ran a "Doctors back to the field" campaign to bring doctors who are working outside the health sector back into clinical work. The campaign resulted in 43 doctors taking the refresher exams that would allow them to return to clinical work, but it is unclear how many actually took up positions in health care. There appear to be no initiatives to change the training volume (or the balance) in residency programmes or in nursing training; for example, there appear to be no concrete plans for training diabetes nurses or nutritionists in Estonia.

Some mild incentives have been put in place to encourage staffing in rural areas, but without success. The greatest health care staffing challenges are outside the country's largest towns; however, all professionals are free to choose their place of work, and there is no mechanism to ensure staffing of particular positions. Since 2012, graduates of the residency programme have been allowed to apply for a one-time grant of €15 000 if they start working in a rural area; during the first 2 years, however, only seven young doctors applied, perhaps because of excessively restrictive grant conditions. Local governments are expected to attract young doctors to work by offering social guarantees and salary bonuses, but this initiative also appears to be ineffective, as the human resource situation is worsening in certain locales.

Some initiatives are in place for task-shifting from doctors to nurses and midwives, especially in family medicine, but the scope is limited, and tasks are not shifted to ancillary staff. Nurses regard themselves as specialists and consider themselves equal to doctors; they do not see themselves as medical assistants, especially in family medicine, where they are responsible for first contacts with patients, health promotion, lifestyle counselling, vaccination and case management. Nurses considered that they would be capable of taking on the tasks of family doctors in remote areas, as they "have greater competence than they use". Midwives already prescribe medication, and nurses consider that they could also do so (independent prescription rights are planned for nurses). Nurses can hold independent consultations, mostly for patient education and counselling on health behaviour and disease management in both primary and specialist care. While nurses consider themselves equal to doctors, lack of teamwork and organizational management of tasks were reported to be frequent challenges in inpatient care. Although independent practice rights have been increased, there appear to be no initiatives in Estonia to shift tasks from medical specialists to ancillary staff, such as sending reminders to patients, arranging appointments and following up on care continuity for NCD cases.

Training of physicians and nurses includes social determinants and population-based aspects of NCDs. The curriculum for physicians complies with European Union standards in principle (at bachelor and master levels) and is a compilation of traditional core subjects, of which 20 should be extensively updated according to the Faculty of Medicine of the University of Tartu. The Faculty estimated that public health-related topics—epidemiology, biostatistics,

health economy, environmental health, health promotion, health care management, history of medicine, and ethics—comprise only about 7% of the total curriculum, which focuses on clinical treatment; thus, students tend to dismiss social determinants of health as unimportant. The reasons for this attitude include the fact that coverage of social determinants is diluted among all clinical topics, presentation of this aspect is left to the judgement of training clinicians, and there is no unified presentation of social determinants in the curriculum. Lifestyle counselling and motivational interviewing techniques should find firm places in the curricula of all health professionals, particularly family doctors and nurses (including specialist nurses), to ensure that their skills match the needs of patients. Health professionals should be at ease in using evidence-based techniques, but all the interviewees who had been trained in motivational interviewing admitted that they felt uncomfortable in using this technique. The main reason given was the short duration of training, which did not allow them time to truly familiarize themselves with the technique.

There is no programme for training dieticians in Estonia. This represents a serious gap in the health care system, because dieticians are in a position to handle the most complex cases of diabetes care and reduce cardio-metabolic risk; they can also provide support and guidance to other professionals, such as primary care doctors and family nurses. Primary care doctors considered that additional training for nurses in diet and physical activity and more specialists in these topics would be beneficial.

The continuing professional education system requires coordination, better selection of teaching methods and more courses. Several aspects of the Estonian continuing professional education system reduce its potential benefit. The courses are not coordinated with national need but depend on the personal initiative of lecturers. Thus, random courses are offered on different topics, and the courses offered are not sustainable, especially in the long term. The current arrangement also means that a particular course may be difficult to find due to small volumes and frequencies, resulting in low coverage of the potential participants. This in turn leads to low "market penetration" of novel approaches that should be used in the health system. Partly because most courses are given by fellow clinicians (many of whom lack training in teaching methods) and partly because of the current institutional arrangements for the provision of training, training sessions are provided as short courses (a maximum of 1–2 days) and in lecture format, with no follow-up, practice supervision or other teaching methods that would support and strengthen application of the acquired knowledge. The training thus has little impact. Family doctors and nurses who had received training in counselling on health behaviour reported that the theoretical approach left them feeling unconfident that they would be able to apply the methods in their everyday work and that they would need practical support in the workplace to acquire first-hand experience in applying the methods.

Challenge 11: Access to high-quality medicines

Access to high-quality medicines for NCDs is on the whole satisfactory in Estonia; however, access in rural areas is still difficult, and the affordability of medicines is still a concern, although it has improved. Accurate information on prescription patterns is not available, and the available data are not used to their full potential.

An important dimension of the management and control of NCDs is patients' access to high-quality medicines. **Although access to high-quality medicines for NCDs in Estonia is on the whole adequate, access could be improved, particularly in terms of availability, affordability and rational use.**

The **availability** of NCD medicines is a function of several factors (Kanavos et al., 2009):

- the adequacy of reimbursement,
- the geographical availability of prescribed medicines,

- the physical availability of prescribed medicines and
- the physical availability of medicines with market authorization.

The availability of NCD medicines in Estonia could be improved in each domain. While the EHIF covers many medications (approximately 1000 international non-proprietary names and 1900–2000 products), the relevance of the list for Estonia's current epidemiological and disease profile has not been formally assessed. **Anecdotal evidence suggests that the list of drugs that are covered is insufficient for the needs of the Estonian population**, for two reasons. First, newly introduced medications tend to be more expensive than older, off-patent ones and may therefore not be included because of concern about cost–effectiveness and budgetary reasons. Secondly, Estonia, with a population of only 1.3 million, is considered a small market by the pharmaceutical industry, making it less profitable to market new drugs there and resulting in delays in their introduction (Kanavos et al., 2009). This applies particularly to generic drugs. Therefore, the prices of originator drugs tend to decrease less than in large markets, and they represent a larger share of the budget for reimbursed pharmaceuticals. Although drugs that do not have marketing authorization and that are not on the market in Estonia can be accessed, continual assessment of the adequacy of the list of drugs covered would indicate how to improve the availability of NCD medicines in Estonia.

Outside of hospitals, pharmaceuticals are dispensed in private pharmacies (80% of which belong to a chain) or from a new online pharmacy (Lai et al., 2013). According to the Ministry of Social Affairs, 99% of the population lives within a 15-min drive of a pharmacy, indicating generally good access. However, **the number of pharmacies in rural areas has been decreasing, making it increasingly difficult for rural patients to obtain medicines.** The lack of access in rural areas is compounded by fewer deliveries to rural pharmacies and longer delays between deliveries (frequently more than 48 h), although the Medicines Act states that the wholesaler must provide speedy delivery and ensure the availability of medicines within a reasonable time (Kanavos et al., 2009). The Ministry of Social Affairs stated that short delivery limits cannot be enforced for small wholesalers that are the sole importers of some medicines.

Ensuring the availability of medicines at reference prices is also a continuing challenge; thus, patients pay an estimated €7 million more for medicines than they would if the corresponding reference-price medication had been prescribed (Lai et al., 2013). Another challenge to ensuring the availability of medicines in Estonia is the fact that multinational manufacturers stop the production or marketing of medicines in a country once they have been authorized or make them available in only some forms or strengths. In 2010, only 42% of all authorized products were actually marketed in Estonia (State Medicines Agency, 2011; Lai et al., 2013). Physicians must apply for special permission on behalf of their patients to obtain access to such drugs. In 2011, almost 8000 such applications were made (Lai et al., 2013). The system of special applications is not only administratively burdensome and time-consuming but also reduces patients' access to the medicines they need.

The affordability of drugs in Estonia has improved but is still a concern. Not only is there limited access to drugs sold at reference prices, but pharmaceutical prices are also higher than in other European countries at a similar level of development (Latvia, Lithuania and Slovakia) and patients co-pay more than the European Union average, despite the introduction of reference pricing and price negotiations (NAO, 2012). Both average expenditure per person per year and total expenditure on drugs have been increasing faster than economic growth and other health care components (Lai et al., 2013).

Analyses of the impact of expenditure on ability to pay (income) indicate that **lower-income groups spend a larger share of their income on health in general and on medicines in particular**; they also have a higher proportion of high or catastrophic expenditure, which becomes overwhelming with high expenditures on pharmaceuticals (Võrk et al., 2014), although lower than in previous studies (Võrk et al., 2009; Võrk et al., 2010). The decrease may be due to both changing behaviour towards cheaper drugs because of promotion of generic prescribing and higher pensions (Võrk et al., 2014). A recent analysis indicated only a small difference between

high- and low-income groups in terms of reclaiming prescriptions (81% versus 86%, respectively), confirming the willingness of poor patients to incur relatively high out-of-pocket expenditure on drugs (NAO, 2012).

Rational use of drugs is another area that could be strengthened. On the provider side, the recent addition of an e-prescription system that links doctors with pharmacies has facilitated the filling and monitoring of prescriptions; however, the system's full potential is not fully exploited. Although (family) doctors can monitor whether their NCD patients reclaim their prescriptions, this information is available only in each patient file, so that it is difficult to identify patients who have not done so. The system also cannot identify potentially dangerous combinations of drugs and cannot automatically flag patients who should have follow-up tests to monitor unintended side-effects.

There is no accurate pattern of prescriptions, as insufficient ex-post audits are carried out each year and the e-prescription system is not used to its full potential. The number of ex-post audits is also inadequate to influence prescription behaviour significantly. Further development of the e-prescription system, with continual feedback to individual providers on their own prescription patterns and those of other family doctors relative to prescribed guidelines could help to improve the rational use of drugs. Some sort of incentive mechanism could be set up to encourage providers to follow up patients who do not reclaim their prescriptions—a problem for physicians in all countries. To address this issue, it is likely that a combination of patient education, monitoring and perhaps incentives will be required.

Challenge 12: Effective management

This health system feature was not assessed at sufficient depth during the review.

Challenge 13: Adequate information solutions

Although Estonia has been a forerunner in the e-health field, with its e-health system, e-prescriptions and the "patient portal", information collection among different institutions and sources is fragmented. In addition, the governance of e-health services and enforcement of data collection and management within these services could be improved. The capacity to analyse data could be increased to strengthen clinical and policy development and decisions.

The components of the health information system are: population health surveys, registries, the EHIF information system and databases, health care provider information systems, the e-health system and information systems for other sectors that interact with the health sector. The Ministry of Social Affairs governs health sector information, and the NIHD conducts relevant surveys and maintains several registries. The Estonian e-Health Foundation maintains the e-health system, and the EHIF maintains its own information system. Individual service providers are responsible for designing and implementing their own information systems.

Standard population health surveys are based on self-reported information and do not include objective measurements. The self-reported responses cannot be validated or calibrated; although self-reported smoking status could be verified by biochemical tests, this is not done. There are no objectively measured population data on weight and height, nutritional status (including childhood obesity), dietary intake or food composition. Furthermore, the surveys do not provide results at county level, as the samples are small; this obviates targeted policy measures by region.

Virtually no epidemiological studies have been conducted on NCDs in Estonia; the available incidence and prevalence figures are based on information on diagnoses from health care providers. Numbers of diagnosed cases are collected by the EHIF from its claims information system, by the NIHD as the institution responsible for health system statistics and from the Estonian e-Health Foundation through the e-health system. The numbers of diagnosed cases differ, however, between the EHIF and the NIHD, because of their different data collection methods (Thetloff & Palo, 2004), and there is no public information on the number of diagnoses in the Estonian e-Health Foundation databases. The lack of epidemiological data undermines all policy initiatives on NCDs, as the actual need is unknown. For example, in the interviews conducted for this assessment, estimates of the proportion of undiagnosed type 2 diabetes in Estonia ranged from 20% to 50%, indicating huge uncertainty about resource needs.

The only registries for NCDs in Estonia are for specific cancers and for acute myocardial infarction. All registries (e.g. the cancer registry and the NIHD causes of death registry) are based on a system of notifications sent by health care providers. Future plans envision that all notifications will be generated automatically from data sent to the national e-health database, which will reduce the administrative burden on service providers; death certificate data will also be collected electronically. One obstacle to the plan is that all the necessary data are not available in the case summaries sent to the central e-health database, due partly to the fact that these registries do not provide timely feedback and clinically relevant information to practitioners. For example, primary results from the cancer registry are published with a 3-year delay. Moreover, registry data are analysed mainly for research purposes (if at all) and not for policy development or improvement of care quality.

The national e-health service platform provides excellent opportunities for innovative information solutions, but it is not used to its full potential. In Estonia, a uniform overall approach is used to all e-services such as the e-health system, which consists of numerous linked individual services. The main principles are that all data providers and users in Estonia and internationally can be linked through a secure multilateral data exchange platform called X-Road, whereby users identify themselves only once for a particular service, even if their use of the system integrates different data providers, and all individual users are uniquely identified. Stewardship of e-health policy in Estonia lies with the Ministry of Social Affairs, and the e-Health Foundation maintains the databases, sets technical criteria for e-health services and commissions the development of the services.

The e-health system integrates individual service providers into an information network and stores summaries of all patient encounters in a central database, which is accessible to clinicians through desktop software and to patients through a web portal. While the case summaries collected are intended to be standardized, structured text documents, enabling automatic data extraction, their use in data analysis is limited by wide variation in the format and structure of the summaries. Moreover, patient outcome data (e.g. blood pressure) are inserted into the text of the case summaries rather than as separate, standardized fields. The e-health system contains no statistics, analysis or information on health risks, health outcomes or treatments to support decision-making. Different data sources (e.g. on social care services) could technically be linked with the e-health system to enrich the data and support clinical decision-making, but such linkages have not been made. A recent audit by the NAO (2014) highlighted these and other means for improving the performance and usefulness of the national e-health system and recommended that

the Ministry of Social Affairs assume its official role of a strategic manager and steward of the health system and chair of the Estonian e-Health Foundation Supervisory Board.

The most successful e-health services in Estonia are the patient portal, e-prescription and e-consultation. The patient portal allows all individuals to view the data on their medical encounters that is stored in the e-health database, if data are submitted by health care service providers; however, there is no enforcement by Ministry of Social Affairs to ensure completeness of the information. E-prescription provides electronic prescriptions by linking clinicians, the EHIF and pharmacies into one system (see Challenge 11). E-consultation is a newer development, whereby family doctors can send electronic data to specialists for a second opinion, thus ensuring that patients are not limited to physical consultations if additional tests are required. Although few specialties have joined the project, the initiative is promising for reducing avoidable visits and duplicated diagnostic tests.

Health care providers are free to develop their own information systems, but they are required to provide a defined set of information to the central e-health system. All health care providers collect information that is not shared, resulting in the collection of different data and collection of the same data in different formats. This is a barrier to further development of the national e-health system. In addition, the service providers themselves bear the cost of software for data exchange with the central system. The service providers who were interviewed during the assessment did not use analyses of outcome measures to support their clinical work. The clinical desktop software for family doctors does not provide an overview of the health outcomes of their entire patient list or according to any specific patient characteristic. The same applies to health risk factors, diagnoses, tests and treatments, as all the information is organized by patient visits. In order to obtain information on, for example, progression of a disease, all visit records for a particular patient must be examined individually, by hand.

A particular problem with the e-health system is coordination among providers. In view of the limitations of data organization in the clinical desktop software and the central e-health database, clinicians cannot obtain an overview of the evolution of cases either in their facility or in the facilities of other service providers. Furthermore, by law, case summaries must be sent to the e-health database within 1–5 days after a case is closed, but a case of chronic disease may be closed only by death in extreme cases. If a patient has seen several specialists, the situation becomes even more complex. In order for family doctors to coordinate and manage the health of their patients, the information must be well organized, a clear overview should be available, and analytical decision support systems should be in place. Alignment of financial and other incentives for PHC and specialist care would benefit from information systems and from care coordination in general.

Challenge 14: Managing change

A thorough examination and review is needed of how priorities and targets are set, how policies are developed, the responsibilities of institutions, how policies are monitored and evaluated and how accountability is ensured to improve change management in Estonia.

Change management in the Estonian health sector should be strengthened. A common thread throughout the interviews was the need for better policy-making. The comments included: there is little political commitment to NCDs (see Challenge 1); the NHP

steering committee is only a formality, and the possibilities of this intersectoral body are not capitalized on; there is no integrated NCD policy (see Challenge 2); the health system is fragmented (see Challenge 3); the outcomes of policies and care are not measured (see Challenge 13); the sustainability of health care financing and human resources is not assured, despite well-known, ever-increasing problems (see Challenges 8 and 10); few partners and especially patient organizations are involved in policy-making; and it is frequently unclear which institutions are to lead policies (see Challenges 2 and 4). These weaknesses indicate the need for a thorough examination and review of how priorities and targets are set; how policies are made, monitored and evaluated; the roles of different institutions and stakeholders; and methods of engaging institutions, stakeholders and other sectors in order to obtain the maximum benefit for population health.

Evidence is often ignored, rather than used to initiate and manage change. An example is the numerous audits by the NAO, such as on the sustainability of the hospital network (NAO, 2010), the effectiveness of medical rehabilitation (NAO, 2006), State supervision of health care providers (NAO, 2007), strategies for promoting a healthy lifestyle and attitudes (NAO, 2008), acquisition and use of medical equipment in medical institutions (NAO, 2011a), the organization of family doctor services (NAO, 2011b) and State involvement in the e-health system (NAO, 2014). These audits have highlighted numerous areas for improvement in the Estonian health system, with suggestions for action. Nevertheless, there has been little response: many of the findings and suggestions of the current assessment are similar to those highlighted in the audits, as well as in other studies.

Challenge 15: Access to care and financial protection

Overall, Estonia ensures good access to care and provides protection against financial risk for its citizens. Nevertheless, the PHC function as the first point of contact for care and the principal care coordinator and manager could be strengthened. This would further improve access to care and financial protection.

Estonia's achievements in ensuring access to care and providing financial risk protection for its citizens are evident from the fact that approximately 95% of the population is covered by health insurance. Household out-of-pocket expenditure as a percentage of total health expenditure was 18.4% in 2012, which is close the median share in the European Union (WHO Regional Office for Europe, 2014b). There is, however, evidence of unmet need in a small proportion of the population; in 2013, 3.4% of people reported an unmet need for primary care, 8% reported an unmet need for specialist care and 8.6% for dental care (Lai et al., 2013).

As in many other countries, there is differential access to some health services according to income, wealthier people reporting more use of dental care services, day care and telephone consultations, and poorer people reporting more use of primary care and emergency care. In contrast, the rate of hospital admissions did not appear to vary by income, suggesting that income is not a significant determinant of health care use for serious illnesses. Some differences in access to specialized care were reported in rural areas; rectifying this differential has been a priority since Estonia regained independence in 1991 (Lai et al., 2013).

Financial risk protection also varies by income, the poorest groups being at greatest risk for incurring catastrophic health expenditure. The main source of catastrophic health expenditures is payment for medications (see Challenge 11 for details).

4. Innovations and good practice

Estonia has provided many good examples of health system restructuring, especially through substantial reforms, which have fundamentally changed the structure and composition of the health care system: most of the system is new, for example, the introduction of health insurance-based financing of health care and creating a PHC system and placing it at the centre of care. This section briefly summarizes the aspects of the Estonian health system that are the basis for further development of a comprehensive NCD care and treatment system.

Placing PHC at the centre of the health care system is an important step towards systematic care coordination and management, as it can ensure integration of different levels of care. The PHC setting is close to the population and easily accessible; it is thus an almost mandatory component of universal health coverage. It is the most person-centred part of health care and builds enduring relationships between the population and their health care providers. PHC is also the best type of health care for health promotion and disease prevention activities for all population groups at risk for NCDs. The Estonian population is satisfied with its PHC-centred system and the care received. It is constantly updated, for example by gradually increasing performance-related payment components and introducing innovations, such as the quality bonus system and e-consultations.

The physical infrastructure of the country's health facilities has improved markedly since Estonia's independence in 1991. Recently, European Union funds have been used extensively to build state-of-the-art facilities and technological resources for both acute and nursing care. Considerable European Union funds will be invested in PHC centres, although it is not clear whether any changes will be made to models of care provision.

Progress in tobacco and alcohol policies is an important development, as Estonia has one of the highest consumption rates of alcohol per capita in the European Union. Green papers on alcohol and tobacco have taken policies to a new level, and the commitment of the Estonian Government to increase taxes on tobacco and alcohol gradually is commendable; it is to be hoped that this initiative will be sustained.

The quality of nursing education is high. Thus, Estonian nurses can compete with nurses from other countries on the international labour market. The curricula and training are aligned with international best practices, and there is capacity to train both more nurses and nurses in a wider array of specialities. Estonian nurses are confident and consider themselves to be as specialized as doctors. They are willing to assume a greater role and more responsibilities in the Estonian health care system.

The potential of e-health is directly linked to the architecture of the system. The common data exchange platform shared by all Estonian e-services provides many possibilities for linking data to create innovative services. E-health services could be used to integrate data from other sectors, thus ensuring, for example, coordination of care in both the health and social care sectors, care management by different care providers, follow-up of care pathways, support for clinical decisions and patient empowerment and education. Furthermore, links could be created between lifestyle or public health and e-health services to enrich records with data provided by patients and to empower patients by facilitating access to their own data.

Health profiles at municipal level determine local health policies. In this example of policy development, information is collected and analysed, and actions are planned on the basis of the results. Moreover, health profiles improve the capacity of localities to set local policies, with use of both health and non-health indicators for measuring population health status.

5. Policy recommendations

The Estonian Government has demonstrated its commitment to health system reform. Many important changes have been made, including introduction of a PHC-centred health care system and national mandatory health insurance. Evidence is often referred to in formulating health policy and in the overarching national health policy, NHP 2009–2020. The WHO Regional Office for Europe and the Estonian Ministry of Social Affairs agreed to conduct the independent external assessment reported here to support further evidence-informed development of health policies in Estonia. This section presents the policy recommendations made after the assessment, which highlight possibilities for strengthening the NCD care and treatment system in Estonia for the benefit of the population. The recommendations are grouped into six main themes:

1. Strengthen coordination and governance.
2. Introduce chronic disease management systems based on PHC.
3. Accelerate action on obesity and nutritional risk factors for NCDs.
4. Upgrade the e-health system into an integrated clinical and decision support system.
5. Empower patients.
6. Analyse the case for change and refine plans for addressing NCDs.

5.1 Strengthen coordination and governance.

As emphasized in section 3, better coordination and governance are important for scaling up population interventions and individual services for NCDs. Population health outcomes could be improved, even at current levels of financing, if interventions and services were better integrated. The most important recommendation of this assessment (which reflects the views of the stakeholders) is to strengthen coordination and governance. The following concrete recommendations could be considered.

Include NCDs clearly and more prominently in the NHP. Only the risk factors for NCDs are presented, with no links to the NCDs themselves. The commitment of the Estonian Government to addressing NCDs should be stated explicitly in the NHP, in order to highlight the issue as a priority, especially to the general public and other sectors. Explicit coverage of NCDs in the NHP would also present clear links between the diseases, their risk factors and health system responses.

Develop a policy specifically addressing NCDs. The NHP 2009–2020 is a high-level health policy; there is no targeted, practical document providing specific guidelines on NCDs. A policy covering the spectrum of NCD prevention and control should be prepared, which would operationalize the high-level objectives of the NHP 2009–2020 and create a link between the objectives and concrete actions.

Set clear targets for NCDs. A results-oriented approach should be used to target and streamline actions to improve all the interventions and services provided. Targets should be set for the NCD policy in general, and specific indicators should be found for interventions and services. As the ultimate goal of health policies is to improve population health outcomes, the indicator framework should include outcome indicators in addition to the current process indicators.

Enhance planning and accountability in inter-sectoral action. The NHP Steering Committee could ensure inter-sectoral planning and action, and detailed discussions

could improve the coherence of the national health policy. Inclusion of international experts in the discussions, creation of specific expert groups similar to those used during creation of the NHP or formation of an independent international scientific advisory panel could result in a visionary policy on NCDs. An accountability system is needed to ensure that analysis of both good and substandard outcomes is used to improve coordination, services or any other causal factor in the reported outcomes. Currently, there are no consequences for an institution if it does not deliver results, as can be seen from the audits (and their follow-up) conducted by the NAO on health sector strategies and policies.

Ensure continuity of care and coordination of action between the health and social sectors. The NCD policy should include a clear plan for integrating all actions, from primary and secondary prevention, through PHC, specialist care, rehabilitation and nursing care and services in the social sector (e.g. disability benefits and long-term care). Clear protocols should be designed, specifying the tasks, processes and resources needed for a patient to move from one point of care to another without obstacles or delays. A shared budget holding or earmarked funding for cross-sectoral activities could be considered.

Increase the focus on equity in planning and activities. In order to obtain the best possible results and to reach the population groups in greatest need, targeted interventions and services should take into account the specificities of those groups. Such a focus in the design and implementation of interventions should become part of all policies and of policy development in general.

Increase use of evidence-based services and analysis of the quality of care, outcomes and cost–effectiveness. Policies should include a clear, outcome-oriented approach to NCDs, to be implemented at all levels of care and in all health care institutions. Analysis of the quality of care shows what measures must be taken to improve outcomes. Real improvement in outcomes is achievable only with actions, interventions and services that are scientifically proven to be effective. Greater use of such evidence-based interventions and services will make the system more cost–effective. Currently, it is not clear how many of the activities in the NHP are based on evidence, although the development of clinical guidelines and the health technology assessment support mechanism for mainstreaming evidence-based action are already in place.

5.2 Introduce chronic disease management based on PHC.

PHC is at the centre of the Estonian health care system and is designed to coordinate patient care, with a corresponding financing model and a strong gatekeeping function. All the other elements of an extended chronic disease management system are also present, such as specialist and long-term care services, population health interventions and social care services. The elements should, however, be better aligned to form a well-functioning system with extensive action to prevent or postpone NCDs; to detect NCDs as early as possible and treat them in primary care; and, for the small proportion of NCDs that progress into severe disease, to coordinate and manage care to reduce gaps and duplication, thereby increasing the probability that patients can function at full capacity in society and as part of a skilled workforce. The recommendations for achieving such a system are as follows.

Place the patient at the centre of care. The physicians and other health care providers interviewed frequently commented that improving health behaviour and health in general are the exclusive responsibility of the patient. They considered that formal service provision and financial arrangements often took priority over the accountability and responsibility of patients. Advocacy and other actions or incentives should therefore be used to increase the responsibility of health care providers for patient health outcomes, in order to place the patient directly at the centre of care.

Increase the coordinating role of PHC. In order to improve the outcomes of care, the responsibilities and accountability of all parts of the health care system should be defined. As PHC is at the centre of Estonian health care system, it is logical that PHC and family doctors in particular should have overall responsibility. The coordinating role of PHC could be strengthened in various ways, including changing PHC and specialist care financing schemes, placing budget-holding responsibilities directly within PHC settings, strengthening the gatekeeping function, preparing care management guidelines, provide training in care coordination and using information technology to support care coordination.

Introduce outcome measurement at all levels of care. In order for clinicians to plan and assess the outcomes of care, they should have outcome indicators and measures that are easy to assess in everyday work, such as a programme to analyse blood pressure results in PHC clinical software. An outcome measurement system would also become the basis for patient follow-up, allowing doctors to ascertain whether treatment has been effective. It would thus form a platform for informed care management of patients with NCDs.

Link outcome measurement with accountability mechanisms and incentive systems. A reporting mechanism is needed from which institutions and the general public can obtain an overview of the performance of individual institutions. Institutional outcome measures might also be linked to financial and other incentives. The incentives considered in this context are usually some form of financial benefit, after qualifying criteria have been met. It has been shown that providing a benefit beforehand and then taking it back if the criteria are not met is an incentive. Positive incentives and learning from good examples should be used rather than punitive action. Various "twinning" approaches can be used, whereby higher and lower performers collaborate for mutual learning and improvement. All investments and resource allocations (including health care funding mechanisms) must contribute to improving outcomes and not only to the provision of health care services and population health interventions.

Review the roles of physicians and nurses in primary and specialist care. Nurses could be used more extensively in the health system, and the trend towards giving nurses independent practice rights could be extended. Prevention and promotion activities could be removed from physicians entirely and given to nurses, who could also provide other health care services. Good examples are foot clinics for diabetic patients and community-based counselling on diet, nutrition and smoking cessation. If nursing roles are extended, physicians could focus on treatment decisions that only they can make.

Introduce ancillary specialists for care coordination and for prevention, patient education and other activities. Non-medical specialists could be included in care teams in Estonia, as contact points or care managers for patients. They would ensure,

for instance, that patients—especially those with severe or multiple conditions or with disabilities or socioeconomic barriers to accessing care—are informed of and attend all necessary appointments with health care providers and adhere to their treatment regimens. Further medical personnel, such as rehabilitation specialists and dieticians, could be introduced into both clinical and community settings.

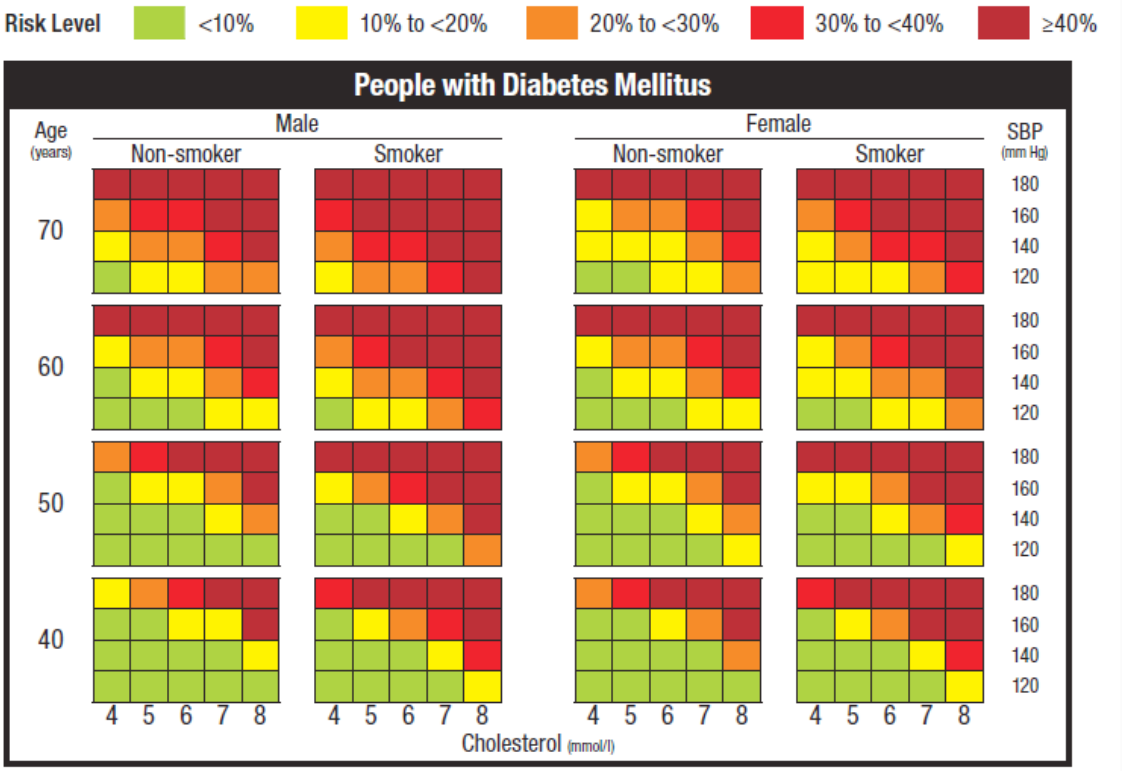
Define patient pathways and standardized discharge management. Currently, individual clinicians involved in the care of a particular patient make appointments with specialists. It is important, however, to ensure that all the important steps in the care process have been taken, for example, that counselling on health risks has been provided, all diabetic patients have seen a nutritionist, all patients with stroke or related diseases have seen a rehabilitation specialist, and all patients with disease at certain severity levels have consulted a social care worker. Defined patient pathways, with procedures and standards, should also include standardized discharge management, with clear rules and procedures for choosing the institution and for the transfer of a patient, so that patients experience a smooth transition to the next stage of care or receive the support they need, including social care and follow-up. Earmarked budgets or budgets shared between the health and social sectors could be considered to support collaboration between the sectors when patients cross from one to the other. Comprehensive training and additional post-training will provide practical support to practitioners for ensuring that patient pathways function properly.

Introduce disease management guidelines. The existing guidelines focus on treatment and the responsibilities of specialists, and there are some materials to help patients understand their disease. Disease management guidelines should be prepared that integrate guidelines on treatment and patient pathways and other materials, so that patients are better prepared to manage their own disease, and the specialists who treat them on their care pathway are better prepared to ensure continuous care and understand their responsibility for the outcome.

Design and introduce further tools for comprehensive cardio-metabolic risk assessment into family medicine, by direct integration into clinical software. Standardized tools should be available to assess patients' cardio-metabolic risk. The interviews showed that such assessments are neither frequent nor systematic. For inclusion of such assessments in family practices, they should be integrated into clinical desktop software, with links to analytical tools for seamless, swift assessment. An example of a suitable tool for comprehensive cardio-metabolic risk assessment is shown in Fig. 5.1.

Increase the availability of disease prevention and health promotion programmes in PHC. Physicians and nurses alike would benefit from further training in counselling, especially on behavioural risks. Additional support and a system for follow-up after training are also advisable, so that practitioners could integrate counselling into their everyday work until it became routine. The availability of such interventions in PHC depends on the financial mechanisms in place (e.g. a specific combination of payment methods) and organizational factors, such as task division between the family doctor and a nurse and the presence of ancillary staff in the practice. Family practices could be opened after working hours to reduce access barriers for working patients and reduce the use of emergency care.

Fig. 5.1. WHO–International Society of Hypertension cross-sectional risk prediction chart for men and women with type 2 diabetes



These charts present the 10-year risk for a fatal or non-fatal cardiovascular event by gender, age, systolic blood pressure, total blood cholesterol, smoking status and presence or absence of type 2 diabetes. The risks were estimated for European Union "R-B" countries, defined as countries with low infant and child mortality but high adult mortality rates (see International Society of Hypertension, 2007, p. 3, for country groupings).

Source: International Society of Hypertension (2007).

5.3 Accelerate action on obesity and nutritional risk factors for NCDs.

Take concerted action to promote a healthy diet and physical activity, based on sound international evidence. The green paper on nutrition is a strong starting-point for strengthening action, and the actions described in the European Food and Nutrition Action Plan 2015–2020 (WHO Regional Office for Europe, 2014c) could provide inspiration. Good examples are available, for example on salt reduction from Finland and the United Kingdom, on trans-fat elimination from Denmark and other countries, on marketing restrictions from Ireland and the United Kingdom, and on food labelling from the Netherlands, the Nordic countries and the United Kingdom. The first step would be to establish regular, representative population monitoring and surveillance, which would include surveys of childhood obesity, diet and salt intake. Examples of best practice are available on physical activity, which will be included in the green paper on nutrition.

Strengthen the capacity of human resources for prevention activities. Family doctors, nurses and other health specialists should receive regular, coordinated continuing professional education, with more participants and longer training. Nutritionists and dieticians in Estonia should also receive training in disease management and care coordination, supported by follow-up training and supervision at the workplace. The volume and extent of coverage of disease management, care coordination, prevention and promotion activities in the main curricula of doctors and nurses should also be increased.

Establish a screening invitation system, targeting certain age and risk groups. Estonia could move away from the current passive approach to screening for health risks, in which patients visit their family doctors on their own initiative, usually only when their health is deteriorating. A system of active invitation to screening, targeting certain age and risk groups, would prevent many CVDs by initiating health promotion and disease prevention interventions before the patient's health has deteriorated severely due to advanced disease.

5.4 Upgrade the e-health system into an integrated clinical and decision support system.

Further develop the country's e-health system, from a document-based approach to standardized information. In order to reap the full benefit of the data in e-health records, they must be in a format that allows easy analysis and management. Even if the data are initially not standardized or of low quality, they should be analysed to establish where the problems are and how they can be resolved. The focus of data collection should be outcomes (e.g. blood pressure, waist circumference, blood glucose level) and health behaviour (e.g. smoking status, level of physical activity, dietary habits), as these are the indicators of whether interventions, procedures and treatments have had an impact on an individual's health. This in turn is the basis for improving care.

Extend and enforce data collection. The Estonian X-Road platform enables seamless integration of different data sources. While case summaries are deposited in central databases, additional data exchange could enrich them; incentives for service and data providers should be revised to extend data exchange. The incentives should not be solely financial; for example, if outcome analysis were mandated for all service providers, the Estonian e-Health Foundation could provide analytical support and at the same time gain access to the data.

Transform the e-health system into a continuous clinical quality management system for real-time care support, including outcomes. The best use of data would be to form a clinical care support system based on statistical analysis of patient pools, by linking patient characteristics (including health behaviour), disease history, care pathways and treatment outcomes. Such data and analyses could suggest possible clinical treatment pathways and projected outcomes for most cases seen by clinicians. Thus, physicians would take more responsibility for care outcomes; currently, they often place this responsibility on patients.

Support development of clinical software for inclusion of outcome measurement and analysis. Some fields of clinical desktop software could be integrated if analytical modules were provided centrally to the developers. Alternatively, modules for different clinical software packages could be coordinated and financed centrally to ensure uniform functionality and integration with nationwide e-health services in selected areas.

Set up an electronic platform for patient-generated data, which could be linked to existing e-health systems. An important element of an efficient chronic disease management system is regular patient follow-up and monitoring. To alleviate the burden of such monitoring on health care providers, patients could be given "e-tools" to measure e.g. weight and blood pressure, to assess e.g. the degree of joint inflammation in cases of rheumatoid arthritis, health status from questionnaires or to record health behaviour (e.g. smoking, diet and physical activity). Information gathered with such e-tools could then be linked with patients' electronic medical records in the e-health system for continuous clinical quality management and clinical decision support.

5.5 Empower patients.

Start health literacy programmes from preschool age. In order to prevent diseases and to prevent people from becoming patients, health literacy should be improved and healthy behaviour instilled from as early an age as possible. Starting health literacy programmes in preschools could thus reduce the burden of NCDs on individuals and the population. Early interventions will also further the development of children in other areas, providing them with opportunities for a good education, economic success and overall well-being throughout life.

Improve and simplify the language used to deliver health information. Medical terms and concepts are often difficult to grasp, and thus such information does not benefit people with lower education levels. Information for specific population groups should be prepared with their characteristics and needs in mind in order to improve uptake by patients.

Support patient organizations and other civil society organizations both financially and with capacity-building. In a patient-centred health system, patients' voices must be heard. Thus, the organizations that channel the voices of patients must be strong and highly professional in their approach. They should therefore be supported, for example with training and other capacity-building interventions and with stable financial resources. Clear criteria for quality and performance should be established to determine whether and how well these organizations represent patients in order to select organizations eligible for funding. Criteria should also be set to avoid conflicts of interest, and a platform should be established for frequent, detailed collaboration between patient organizations, other stakeholders in health care and the Ministry of Social Affairs.

Increase the volume of social marketing campaigns and other communication initiatives to empower patients and inform them of their rights. The scope and volume of population interventions to promote healthy lifestyles and prevent disease should be increased. Such interventions and other public health actions could be made higher priorities than they are currently.

Prepare an information tool for patients in the e-health system, similar to clinical quality support tools. Patients in Estonia own their information. While the patient portal gives them basic access to their data, the information is not presented in lay terms and addresses mainly clinical needs. To empower patients further, tools are needed to put their clinical findings into context and give them a better understanding of their treatment options and possible outcomes. The tools could include analytical approaches and algorithms similar to those used in clinical decision support systems but in a language and presentation suitable for patients.

5.6 Analyse the case for change, and refine plans for addressing NCDs.

Regularly assess population needs. The development of evidence-based policies requires a variety of studies. Estonia should invest in epidemiological research to determine the degree of under-diagnosis of diseases such as diabetes and depression and the over-diagnosis of, for example, hypertension. Studies on health behaviour are needed; for instance, there is currently no population information on the amount of salt

in the diet, and the alcohol consumption of different population groups does not match the overall alcohol consumption recorded. Such information, in combination with models of the state-of-the-art care available for specific diseases, could be used to plan resource needs and care coverage patterns.

Support use and analysis of existing data. Research funding allocated to the NIHD, the University of Tartu and other research institutions could include earmarked funding for specific use of existing data (rather than generating new data) to create evidence and support policy, in addition to care support. Research capacity should be strengthened in parallel, and research collaboration between institutions incentivized. Estonia could consider using the OpenData and BigData initiatives to improve the value of existing data. In OpenData, original raw data are made publicly available (with adequate anonymization) by the original source, whereas in BigData various sources of data are compiled into one data pool (e.g. on health status, social care benefits, mobile phone location and ambulance calls), so that correlations between different variables can be sought to identify predictors of the variable of interest (e.g. health care use). These approaches provide evidence that is useful for disease prevention and planning health care services.

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Annex 1. Data sources and methods

The principal source of data on demographic and health-related indicators for this report was the European Health for All database (WHO Regional Office for Europe, 2014). Most of the data were for 1980–1990 to 2009–2010. The indicators selected for analysis are based on expert recommendations and practical considerations of the available evidence.

Estimates and projections from data reported annually in the 53 Member States of the WHO European Region were used. Country subgroups defined in the European Health for All database were applied to distinguish regional trends:

- EU-15: the 15 Member States in the European Union 1 May 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom;
- EU-12: the 12 Member States that joined the European Union in May 2004 or in January 2007: Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia; and
- the Commonwealth of Independent States until 2006: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, the Republic of Moldova, the Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

The countries in the European Region that are not in these groups are: Albania, Andorra, Bosnia and Herzegovina, Croatia, Iceland, Israel, Monaco, Montenegro, Norway, San Marino, Serbia, Switzerland, the former Yugoslav Republic of Macedonia and Turkey.

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Annex 2. Criteria for scoring tobacco, alcohol and nutrition-related interventions

Table A2.1. Tobacco control: summary of core service coverage

Coverage	Limited	Moderate	Extensive
Range of antismoking interventions (WHO Framework Convention on Tobacco Control)	**Prevalence among adults > 30%**	**Prevalence among adults 18–20%**	**Prevalence among adults < 18%**
Raising tobacco taxes	Tax is < 25% of the retail price.	Tax is 25–75% of the retail price	Tax is > 75% of the retail price
Smoke-free environments	100% smoke-free environment enforced only in schools and hospitals	100% smoke-free environment enforced in hospitals, schools, universities, public transport and workplaces	100% smoke-free environment enforced in all public places, including hospitality sector
Warnings on the dangers of tobacco and smoking	Warning labels required on tobacco products (size not specified)	Warning labels required on all tobacco products covering ≥ 30% (front and back)	Warning labels required to cover > 50% (front and back), with graphics (standardized packaging)
Bans on advertising, promotion and sponsorship	No bans on national television, radio or in print	Ban on direct and indirect advertising and promotion	Ban on all advertisement and promotion, including points of sale, with effective enforcement
Quit-lines and nicotine replacement therapy*	No quit lines; Government-funded cessation services, with nicotine replacement therapy allowed if paid in full by the individual	Quit lines; Government-funded cessation services available (possibly with payment by the individual); nicotine replacement therapy available if paid in full by the individual	Free-of-charge quit line, with cessation services and nicotine replacement therapy available and affordable (covered at least partially)

*Additional criteria not included in the Global Action Plan
Source: WHO Regional Office for Europe (2014)

Table A2.2. Interventions to prevent harmful use of alcohol: summary of core service coverage

Coverage	Limited	Moderate	Extensive
Raising taxes on alcohol	Alcohol taxes follow price index	Alcohol taxes follow price index, with special taxes on products attractive to young people	Alcohol taxes follow price index and are related to alcohol content, including special taxes on products attractive to young people
Restrictions or bans on advertising and promotion	Regulatory framework regulates the content and volume of alcohol marketing	Regulatory framework regulates the content and volume of alcohol marketing, including direct and indirect marketing and sponsorship	Full ban on alcohol marketing of any kind
Restrictions on retail availability of alcohol	Regulatory framework exists on serving alcohol in government and educational institutions	Regulatory framework exits on serving alcohol in government institutions, and serving alcohol is banned in educational institutions	All governmental and educational institutions must be alcohol free
Minimum purchase age regulation and enforcement*	Minimum age for purchasing all alcohol products is 18 years	Minimum age for purchasing all alcohol products is 18 years, and effective enforcement measures are in place	Minimum age for purchasing all alcohol products is 18 years, effective enforcement measures are in place and loss of licence for illegally selling alcohol to people aged < 18 years
Allowed blood alcohol content for driving	Maximum of 0.5 g/L	Maximum of 0.5 g/L and 0 for learning and professional drivers	Maximum of 0.2 g/L and 0 for learning and professional drivers
Multi-sector policy development*	Multi-sector national strategy on alcohol policy	Multi-sector national strategy and a coordinating council on alcohol policy	Multi-sector national strategy, a coordinating council on alcohol policy and an adequately resourced nongovernmental sector, free of potential conflict of interest with public health

*Additional criteria not included in the Global Action Plan
Source: WHO Regional Office for Europe (2014)

Table A2.3. Diet and nutrition: summary of core service coverage

Coverage	Limited	Moderate	Extensive
Interventions to improve diet and physical activity	Prevalence of overweight and obesity in children and adults (pre-obesity and obesity) is ≥ 30%	Prevalence of overweight and obesity in children and adults (pre-obesity and obesity) is 20–30%	Prevalence of overweight and obesity in children and adults (pre-obesity and obesity) is < 20%
Reducing salt intake and salt content of foods	≤ 10% reduction of salt intake has been registered since the mid-2000s	Salt intake has been reduced by ≥ 10% since the mid-2000s	Salt intake has been reduce by > 10% since the mid-2000s
Virtually elimination of trans-fatty acids from the diet	No evidence that trans-fats have been significantly reduced in the diet	Trans-fats have been reduced in some food categories and in certain industries but not overall	Trans-fats are virtually eliminated from the food chain through government legislation and/or self-regulation
Reducing free sugar** intake*	Reduction of the intake of free sugars** is mentioned in policy documents, but no action has been taken	Reduction of the intake of free sugars** by 5% is mentioned in policy documents and partially achieved in certain food categories	Reduction of the intake of free sugars** by 5% is monitored, with a focus on sugar-sweetened beverages
Increasing intake of fruit and vegetables*	The aim to increase consumption in fruit and vegetables is mentioned, but no monitoring data have been collected	The aim to increase consumption of fruit and vegetables is in line with the WHO/FAO recommendations of ≥ 400 g/day, and some initiatives exist to this effect	The aim to increase consumption of fruit and vegetables is in line with the WHO/FAO recommendations of ≥ 400 g/day, with population initiatives in place and incentives to increase availability, affordability and accessibility
Reducing marketing pressure on children to consume food and non-alcoholic beverages*	Marketing of foods and beverages to children is noted as a problem, but no specific action has been translated into government-led initiatives	The WHO recommendations on marketing have been acknowledged. and steps have been taken for self-regulation to reduce marketing pressure on children	The WHO recommendations on marketing and a framework for implementation are followed consistently, including a mechanism for monitoring
Promoting awareness about diet and activity	No workforce development for nutrition and physical activity, and nutrition and physical activity are not priorities in primary care	Some workforce has been developed for nutrition and physical activity; nutrition and physical activity are considered priorities in primary care	Workforce has been developed for nutrition and physical activity, and nutrition and physical activity are a priorities in primary care

* Additional criteria not included in the Global Action Plan
** Free sugars are monosaccharides (such as glucose, fructose) and disaccharides (such as sucrose or table sugar).
Source: WHO Regional Office for Europe (2014).

Reference

WHO Regional Office for Europe (2014). Better noncommunicable disease outcomes: challenges and opportunities for health systems. Assessment guide. Copenhagen (http://www.euro.who.int/__data/assets/pdf_file/0005/247649/HSS-NCDs_Guide_WEB_Version_20-11.pdf, accessed 5 March 2015).

The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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