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# **ESTONIA HEALTH SYSTEM PERFORMANCE ASSESSMENT**

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2009 snapshot



EUROPE

# **ESTONIA HEALTH SYSTEM PERFORMANCE ASSESSMENT**

2009 snapshot

## ABSTRACT

This report presents the main findings of an assessment of the performance of the Estonian Health System, carried out jointly by the WHO Regional Office for Europe and the Ministry of Social Affairs of Estonia in 2008 and 2009. This assessment was part of the biennial collaborative agreement between the Ministry of Social Affairs of Estonia and the Regional Office. The initial objectives of this evaluation were to: present international evidence supporting the use of health system performance measurement for performance assessment and improvement; propose an initial set of performance indicators with related findings; and put forward ideas about how to strengthen accountability in order to stimulate performance improvement. A working group was set up by the Ministry of Social Affairs to develop this first health system performance assessment report. It produced a performance assessment framework based on prior work on health system strengthening, selected a balanced set of performance indicators reflecting the performance measurement framework; collected the data and calculated the performance indicators; and interpreted the results with support from national and international experts. Data collection took place during the first semester of 2009. An executive summary is enclosed in this report, as well as an annex presenting potential performance indicators to be collected in the future.

## Keywords

OUTCOMES AND PROCESS ASSESSMENT (HEALTH CARE)

HEALTH SYSTEMS PLANS – organization and administration

PUBLIC HEALTH – organization and administration

HEALTH STATUS

QUALITY OF HEALTH CARE

PROGRAM EVALUATION

ESTONIA

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# EXECUTIVE SUMMARY

*In the context of the current economic downturn, Member States of the WHO European Region emphasize more strongly assessing the performance of their health systems to enhance accountability and demonstrate progress.*

Improving the performance of national health systems is a priority issue in the health sector across the European Region, especially in the current economic climate in which improving the performance of national health systems is paramount. In this regard, assessing the performance of national health systems through quantitative methods such as health system performance assessment is a recognized approach among the Member States of the WHO European Region. It has been given renewed recognition and impetus by the Tallinn Charter: Health Systems, Health and Wealth, through which Member States of the WHO European Region commit themselves to transparency and to being held accountable for health system performance to achieve measurable results.

## **Health system performance assessment supports Estonia's Ministry of Social Affairs in driving improvement in the health system and in exercising its stewardship role**

The rationale for carrying out health system performance assessment is ensuring that the health system has a strategic direction with clarified quantitative measures and targets indicating the government intent to improve health outcomes for the population; that policy decisions are informed by appropriate intelligence related to health problems and their determinants; that relationships between all health stakeholders are regulated in a context of transparency and accountability; and that relevant information is available to support decision-makers in setting priorities in investment in strengthening the health system. Health system performance assessment is an important tool for health ministries in the WHO European Region to carry out their stewardship function in health systems and to improve health system performance.

In the past decade, Estonia has continually advanced in setting and measuring targets for various public health programmes, for institutions in their development plans and for the health system generally within the broader government agenda. Thus, this report builds on previous efforts that have contributed to broader health system performance assessment. It reviews international experiences, presents the first attempt to tailor performance assessment to the specific characteristics of Estonia's

health system and brings forth ideas about how to enhance accountability in Estonia's health system. In addition, this report aims at providing a possible framework for developing a monitoring and reporting system for Estonia's National Health Plan 2009–2020. The National Health Plan brings together the main strategic goals of Estonia's health system until 2020. Finally, this report should be seen as a first step in the development of a full-fledged health system performance assessment mechanism supporting health system performance management. This assessment is a joint effort by Estonia's Ministry of Social Affairs and the WHO Regional Office for Europe and is a result of continual collaboration in recent years.

*Estonia's health system performance assessment has been developed following a rigorous method focused on gathering quantitative evidence and interpreting it in the context of national health system goals.*

The methods used to carry out this health system performance assessment involved reviewing similar experiences from other countries in assessing health system performance, developing a framework for performance measurement consistent with the priorities of the government for health system strengthening and with its international commitments, mapping the numerous indicators used in current health sector strategies, selecting an initial set of performance indicators for various performance domains, based as much as possible on international evidence, and interpreting findings in the context of national health system objectives. A reference group comprising national and international experts reviewed and amended the report. It provides a first snapshot of health system performance in 2009 and serves as a basis for future discussions on how to further develop health system performance assessment in Estonia.

*The findings from the assessment of the performance of Estonia's health system are organized under eight headings, each of which seeks to answer important questions for Estonians.*

The report addresses eight main policy questions.

1. How healthy are Estonians?
2. How well is the health system performing in keeping people healthy?
3. What is the impact of broader determinants of health in Estonia?
4. How responsive is the health system to the needs and expectations of Estonians?

5. Is the way the health system is funded fair and equitable?
6. Does the health system provide good and equitable access to health care services?
7. In their interaction with health care services, are Estonians receiving safe and high-quality care?
8. Is the health system efficient and effective?

*Although the performance of Estonia's health system overall is mixed, several important achievements have been made during the past two decades.*

The main strengths of Estonia's health system include improving the health status of the population in recent years, improving the coverage of the population, increasing the efficiency of the health system, and to a higher level of health care services. Estonians enjoyed sustained gains in their life expectancy at birth, which increased from 70 to 74 years between 2000 and 2008. This increase in life expectancy is directly linked to reduced mortality rates among all population groups, but especially among young people. A good example is the infant mortality rate, which has declined considerably over the years to 5.01 deaths per 1000 live births in 2007, the same as the European Union (EU) average. Further, declining mortality caused by injuries, cardiovascular diseases and other diseases has greatly contributed to this increase in life expectancy. Finally, the expected number of years of education, which is one of the broader determinants of health, has increased substantially since 1998 and is now above the EU average.

Activities in preventing disease and promoting health have been a key priority in Estonia in recent years, and progress has been made in developing strategies carried out at both the population and individual levels. A notable area of good performance is the high level of immunization coverage among children, where Estonia is at the EU average.

Estonians appear to be generally highly satisfied with health care services in general and with the quality of primary health care and hospital care services in particular. The overall proportion of the population satisfied with health care services is close to the target of 72% set for 2020 by the National Health Plan 2009–2020.

Efficiency has improved substantially in recent years: for instance, the number of hospital beds per 100 000 population and the average length of hospital stay have

reached or are close to the EU averages. The primary health care system also delivers more services, with both efficiency and client satisfaction increasing in parallel.

In addition, the rate of mortality avoidable by health care interventions has decreased substantially over the past decade, indicating that health care interventions have become more effective. At the same time, expenditure on health care has increased at a slower rate, indicating overall improvement in cost-effectiveness. Further, 95% of the population is covered by health insurance, which indicates that most Estonians have access to health care services. Health care utilization rates have been close to the EU averages for inpatient admissions and outpatient contacts since 2002.

*The main weaknesses of the health system include low disability-free life expectancy, gender and regional inequality and risk factors challenging recent progress in population health.*

Despite recent improvements, the life expectancy at birth in Estonia was still about 5 years below the EU average in 2008. Further, Estonian men are expected to live 10 to 11 years less than Estonian women and 13 years less than Icelandic men. Estonia also has relatively large regional differences in life expectancy.

Disability-free life expectancy is also relatively low. Estonian males can only expect to live 51.4 years without disability versus up to 70 years in other European countries. This translates into burden of disease findings in which 60% of the loss of life-years is due to premature deaths and lifetime morbidity before 65 years of age. These results imply a significant loss of productive capacity for the country through ill health. Finally, Estonia has major regional, socioeconomic and gender inequality in the distribution of the burden of disease.

Another serious concern is the fact that Estonia performs poorly on behavioural health risks such as alcohol and tobacco consumption, overweight and obesity relative to other EU countries. These risk factors threaten the progress achieved in avoidable mortality and gains in life expectancy and should be a priority for action in the short and medium term. This is especially important because Estonia's low life expectancy and disability-free life expectancy compared with the EU averages and related inequality in these areas are directly linked to disparity in behavioural health risks.

Health system financing in Estonia has generally been progressive, meaning that households with higher gross income have also paid relatively more to support the health system. However, financing has become less progressive since 1999, primarily

due to increasing out-of-pocket payments. Despite economic growth, the percentage of households incurring catastrophic health expenditures has increased. Since 2001, about 2% of Estonia's households each year have been pushed into poverty because of high out-of-pocket payments. Higher-income groups have higher utilization of dental care, phone consultations, specialist care and perhaps day treatment services. This suggests inequity in access, in particular to dental care, as user charges for dental services are likely to influence those with low incomes, and a higher proportion of those in the lower income quintiles reported problems in accessing dental care. In addition, 5% of the population is still not covered by health insurance. In times of economic crisis and increasing unemployment, insurance coverage is likely to decrease. At the same time, universal health insurance coverage is an objective of all Member States of WHO.

Although the organization of health care services in Estonia has changed substantially during the past decade, the satisfaction with health care services has changed little. However, this can also be viewed positively, since health care reforms tend to generate dissatisfaction, but in Estonia the population satisfaction levels have remained stable.

One weakness of the health system is the perceived length of waiting times. This is accompanied by the perception that access to services is difficult: only slightly more than half the population rate access to health care as being “good” or “rather good”. These results lag behind the target of 68% for 2020 set by the National Health Plan 2009–2020.

Another area of concern is the balance of primary and secondary health care services in some regions. In three counties (Lääne, Saare and Ida-Viru), high hospitalization rates correspond with low rates of utilization of general practitioner services, suggesting that hospitals are probably being used heavily because of inadequate access to primary care. **Further, although the number of nurses and other ancillary staff working in hospitals has been reduced, there has not been a relative increase of nursing and support staff over physicians.**

*There are opportunities for improving the performance of the health system.*

If avoidable causes of mortality had been eliminated by 2008, life expectancy would have increased by 4 years, bringing Estonia closer to the EU average of 79 years and the target for 2020 of 80 years of the National Health Plan 2009–2020. The potential for improvement lies with such diseases as ischaemic heart disease, stroke, lung cancer, liver cirrhosis and injuries. All these can largely be addressed over the long

term by changing lifestyle behaviour – reducing alcohol and tobacco consumption, increasing physical activity and balanced diet and improving injury prevention. All these changes in health behaviour would ultimately translate into a healthier and more productive population.

Another opportunity for improving performance is diversifying funding sources for the health system, which could increase its financial sustainability and reduce out-of-pocket payments, thereby enhancing the financial protection offered by the system to the people with the lowest income. Focusing on providing coverage for additional services, such as dental care, specialist care and day treatment services, and on limiting out-of-pocket payments would be advantageous.

Other possible ways of improving performance include developing a quality and safety agenda for health care services. Providers seem ready for this, but investment in measuring performance and the further development of a quality improvement culture are required. This agenda will also require better integration between primary, secondary and long-term care to provide individual-centred services. From that standpoint, the positive experience related to introducing contracting and performance reporting in Estonia is an opportunity for the Estonian Health Insurance Fund to enhance accountability and the improvement of performance across the system.

There is also scope for improving the efficiency of the system by better balancing primary, secondary and long-term care services in Estonia and between counties. One effect would be better equity in access between counties.

Finally, poor results on major risk factors can also be seen as an opportunity to give priority to public health and health promotion measures. From this perspective, measuring and evaluating the impact of these public health measures will be important to make a case for future investment.

*Several threats will have to be overcome to consolidate benefits from efforts to strengthen the health system.*

The first set of threats to the health system relates to the current economic recession. The rate of unemployment increased sharply in 2009, and unemployment and declining household incomes are strongly associated with poorer health. This also creates problems for health care financing, as tax-based payments into health insurance decrease significantly due to parallel decreases in household incomes and their capacity to pay out of pocket. The economic threat is a vicious circle of poverty and



ill health, in which the costs of health care are neither covered by health insurance nor affordable to those who do not have insurance, especially people with low income. Further, unhealthy responses to poverty and stress resulting from the recession such as poor nutrition habits, excessive alcohol consumption and smoking and excessive risk-taking could continue to worsen, leading to a deterioration of population health through an increase in cardiovascular diseases, injuries and sexually transmitted infections such as HIV. Counteracting the negative effects of the recession on healthy behaviour and risk factors through targeted public health and health promotion measures is therefore important.

Finally, since peripheral regions have the highest unemployment rates and burdens of disease, regional inequality could worsen and threaten social cohesion. However, these threats were present even before the economic recession, which merely accelerates the processes already present and draws more attention to them. In conclusion, targeted efforts to improve and better integrate health care services, public health and health promotion efforts are required to improve health system performance and population health in Estonia.

*This health system performance assessment report is a first step towards a regular measurement and reporting process linked to accountability and focused on improving the performance of the health system.*

This summary touches on the main themes of the full report, which provides further details on the results for each policy question mentioned. The next steps relate to identifying the measures the government, ministries, public agencies, service providers and wider groups of stakeholders can take to drive improvements in performance. The Ministry of Social Affairs is directly responsible for several of these measures, especially those related to the health system (including both public health and health care). Others will require the Ministry of Social Affairs to reach out to other health system stakeholders or other ministries across the government to take coordinated action to improve performance. A final section of the report reviews the different types of action required to ensure improvement in the performance measures presented in the report. Core measures of health system performance require different types of action depending on how performance has improved over time and how it compares with that in other countries, targets or benchmarks. The report also reviews the accountability regimens in place for a few performance indicators, which is a precondition for successfully implementing measures to improve performance. Finally, the report presents recommendations for institutionalizing health system performance assessment in Estonia. To better manage health system performance, decision-makers should

be able to use strategy-based performance indicators systematically and regularly to support decision-making and the setting of priorities for investment.

# SECTION I. CLARIFICATION OF CONCEPTS, METHODS AND PRACTICES IN HEALTH SYSTEM PERFORMANCE ASSESSMENT

## **Health system performance assessment: a tool for performance improvement and accountability**

The World Health Organization (WHO) defines health systems as “all actors, institutions and resources that undertake health actions – where the primary intent of a health action is to improve health” (1). Health systems encompass personal health services (commonly under the direct control of health ministries), non-personal health services (mainly public health and health promotion interventions), and intersectoral actions designed specifically to improve health (such as anti-tobacco campaigns or road safety regulations). Health system boundaries are difficult to define, however the scope of this first assessment of the performance of Estonia’s health system voluntarily limits itself to performance domains for which the health ministry and its agents are accountable for delivering better results. The link to accountability is a pre-condition to improving performance.

Although health systems throughout the world vary widely in their design and organization, they generally share the same core goals of good health, responsiveness to people’s expectations, and social and financial protection (1,2). Health systems have four common functions of stewardship, health services provision, resource generation and health financing. Stewardship involves setting, implementing and monitoring the rules of the game for the health system; assuring a level playing field among all actors in the system (especially purchasers, providers and patients); and identifying strategic directions for the health system. Financing is the process by which revenue is collected, accumulated in fund pools, and allocated to specific health actions. Service provision entails the way inputs are combined to allow the delivery of a series of interventions or health actions. These comprise personal health services – preventive, diagnostic, therapeutic or rehabilitative – and non-personal services such as health education for the public, legislation, and the provision of basic sanitation facilities. Resource generation refers to institutions that produce inputs – especially human resources, physical resources (such as facilities or information management systems and knowledge – for service provision and financing. Education and research centres

and an array of organizations producing technologies such as pharmaceutical products, devices and performance measurement fulfil these roles (3).

Assessing health system performance involves measuring and analysing how well a health system is meeting its ultimate goals (such as better health status for the population (level and distribution), better health system responsiveness, and social and financial protection) (1,2), and how its performance against intermediate objectives (such as access, coverage, quality and safety of health services) (2) contributes to meeting these goals.

A fully developed health system performance assessment approach has the following attributes (4):

- It is regular, systematic and transparent. Reporting mechanisms are defined in advance and cover the whole assessment. It is not bound in time by a reform agenda or national health plan end-point, though it might be revised at regular intervals to better reflect emerging priorities and revise targets as they are attained or not.
- It is comprehensive and balanced in scope. It covers the whole health system and is not limited to specific programmes, objectives or levels of care. The performance of the system as a whole is not equivalent to adding up the performance of each of its constituents.
- It is analytical and uses complementary sources of information to assess performance. Performance indicators are supported in their interpretation by policy analysis, complementary information (qualitative assessment), and reference points (trends over time, local, regional or international comparisons, or comparisons to standards, targets or benchmarks).

Health system performance assessment corresponds to a performance accountability approach grounded in management science, which aims at demonstrating and accounting for performance in light of agreed-upon performance targets and, as such, differs from accountability for compliance with procedures and rules (also known as hierarchical control). It holds stakeholders accountable both for the performance of their national, regional and local health systems and for their own actions to improve performance. A commitment to accountability is a constructive tool for organizational development, enhancing management practices, self-evaluation and strategic planning. More specifically, it has been demonstrated that building coherence between strategy, performance management and accountability by measuring performance

can lead to performance improvement and increased value for health systems (5). In addition, releasing publicly available report cards has enhanced public accountability for health system performance by documenting the relative performance of national health systems, often with related international rankings (6). Such scorecards have raised awareness of and interest in how health systems are performing at all levels. Although many methodological challenges remain related to comparability of data and aggregation of indicators in league tables, the response to these reports indicates the power of such comparisons (7).

Health system performance assessment can also have a more direct role in improving the performance of health systems. As outlined by Smith et al. (8), performance measurement offers policy-makers a major opportunity for improving health systems and accountability for performance. However, the opportunity for this to be realized depends on the political and organizational context within which performance measurement data are collected and disseminated, and how they are presented to and interpreted by patients, providers and practitioners and the public. In addition, experience shows the importance of paying attention to the broader health system to ensure that performance measurement is aligned with the design of mechanisms such as financing and market structures. Finally, performance measurement systems should be monitored frequently and evaluated to identify opportunities for improvement and any unintended side-effects, and health system stakeholders should be involved in building a common understanding of the strengths and weaknesses of health system performance (6).

## **Experience with health system performance assessment in Europe and worldwide**

Most countries of the WHO European Region have incorporated elements of health system performance assessment into their health system stewardship function. However, very few have developed systems that have formalized and integrated all its attributes with the potential to substantially improve performance. Table 1 presents an overview of the implementation of health system performance assessment in selected countries of the WHO European Region. Consistent with the approach presented above, it reviews the characteristics of health system performance assessment and identifies strengths and weaknesses in implementation. For example, a “-” score under “Regular, systematic and transparent” means that the assessment is not released regularly or that the results are not shared broadly and transparently with health system stakeholders and the public at large. Conversely, a “+” score in the

“Link to health system performance management” column means that performance information is clearly linked to strategy, and that processes are in place to ensure that it is used systematically at different stages of the decision-making process, for policy development, resource allocation or accountability decisions. A “-/+” score indicates that the situation is unclear.

**Table 1. Overview of health system performance characteristics in selected countries in the WHO European Region**

Country	Performance assessment			Accountability and performance management	
	Regular, systematic and transparent	Comprehensive and balanced in scope	Depth of analysis	Link to accountability	Link to health system performance management
Armenia	-/+	-	+	-	-
England (United Kingdom)	+	+	+	+	+
Estonia	+	+	+	+	-
Georgia	-	+	+	-	-
Kyrgyzstan	+	+	+	+	+
Netherlands	+	+	+	+	+
Portugal	+	+	-/+	+	-
Sweden	+	-	+	+	+

Source: The European health report 2009 (4).

Based on Table 1, the following section outlines selected country examples, in which specific attributes of health system performance assessment have been implemented, and how these translate into practice.

**The Netherlands: regular, systematic and transparent health system performance assessment**

In the Netherlands, the Ministry of Health, Welfare and Sport commissioned the National Institute of Public Health and Environment (RIVM) with developing and releasing performance assessment reports for the health care in 2007 and 2008. The reports are published annually on the web site of the RIVM (9, 10). The framework for health system performance assessment focuses on the technical quality of care, while maintaining a broader perspective on health and its other determinants. It measures performance

through 110 performance indicators. The selected system goals and indicator domains are in accordance with the policy of the Ministry of Health, Welfare and Sport.

### **England: comprehensive health system performance assessment**

Since 1999, England has developed four systems of performance assessment for the National Health Service: the National Health Service (NHS) Performance Assessment Framework (PAF) (11) is based on six areas of performance: health improvement; fair access; effective delivery of appropriate health care; efficiency; patient care experience; and health outcomes of NHS care. The annual star rating system from 2001 to 2005 rated organizations from zero (failing) to three stars (high performance) based on assessment against a set of key targets and a balanced scorecard of three domains varying by the type of organization. Failing key targets put an organization at risk of being rated zero. Three stars required good performance on key targets and the balanced scorecard. In 2006, the Health Care Commission (which later became the Care Quality Commission) was tasked with assessing organizations on an annual health check with two components: financial management and quality of care. Each organization's performance is assessed on each component in terms of safety, access and clinical effectiveness. In 2009, the Department of Health introduced a new NHS Performance Framework to provide a dynamic assessment of the performance of NHS providers and commissioners against minimum standards. As part of this framework, a series of indicators are selected from across the domains of finance, operational standards and targets, quality and safety and user experience.

### **Kyrgyzstan: health system performance assessment supported by in-depth analysis addressing performance drivers**

The Department of Strategic Planning and Reform Implementation within the Ministry of Health carries out regular health system performance assessments. The Centre for Health System Development supports the Ministry. It is an autonomous public entity responsible for supporting policy development and implementation by generating knowledge, analysing performance in depth and conducting training. Health system performance indicators and evaluations of the impact of reforms have been monitored and published regularly since 2004. The last report in 2008 assessed the effects of implementing the health system reform programme and showed that, at the halfway mark, key performance indicators demonstrate strong and sustained progress towards meeting targets on financial protection, access, efficiency, and transparency, whereas results appear mixed in terms of health and quality of care indicators.

## **Portugal: linking health system performance assessment and accountability structures and processes**

In Portugal, the National Health Plan 2004–2010 (12) sets performance improvement objectives for the health system and monitors progress on targets related to the plan. The set of performance indicators is available on the Internet and monitored regularly (13). The National Health Plan has many characteristics of a framework for health system performance assessment through its scope and regular reporting mechanisms. To ensure the implementation of the plan, structures (Office of the High Commissioner for Health) and processes (coordination mechanisms through an interministerial committee) were established to clarify roles and responsibilities, coordinate implementation and ensure accountability across government and across the health system for achieving health system targets.

## **Ontario, Canada: linking performance assessment and health system performance management**

In Canada, the Province of Ontario has developed a framework that is sensitive to key health system issues. To streamline information and improve data quality, a provincial health system scorecard based on health system strategies has been developed that draws on a core set of measures that convey the performance of the overall health system. Through an iterative issue abstraction and strategy mapping exercise nine strategic goals were selected that best reflect the full extent of the health system's ongoing initiatives to improve performance and are populated by a balanced set of 27 indicators relevant to health system renewal. The nine dimensions reflect both overall health system goals and current government priorities; are strategically linked to performance management; and fall within four key quadrants of performance: evidence availability and use, provision of care, health status and outcomes, and health system sustainability and equity. These quadrants form the core chapters of the scorecard, providing an overall picture of performance in Ontario. Furthermore, core health system indicators were cascaded into accountability agreements with regional health authorities, in order to drive performance improvement (5).



## **Assessing health system performance: a brief review of existing conceptual frameworks**

The literature on health system performance measurement is characterized by a lack of consistency in the use of terms. Arah et al. provided an overview of possible dimensions of health system performance and their presence in available performance frameworks (14), completed in Table 2 with performance dimensions from the frameworks of the Netherlands, New Zealand and Sweden. This overview shows that consistency in terms for major dimensions is lacking. Frameworks for health system performance assessment are largely concerned with interrelationships among health, health care, and non-health care factors such as broader social determinants of health, and not only with performance related to health care.

**Table 2. Overview of performance dimensions present in selected frameworks for health system performance assessment**

Dimension	United Kingdom	United States	Canada	Australia	Netherlands	Sweden	New Zealand	WHO	OECD (Organisation for Economic Co-operation and Development)	ECHI (European Community Health Indicators)	Commonwealth Fund
Acceptability			X								X
Accessibility	X		X	X	X	X	X	X	X	X	X
Appropriateness	X		X	X							X
Care environment and amenities	X							X			
Competence and capability			X	X			X	X			X
Continuity			X	X			X	X			X
Effectiveness, improving health and clinical focus	X	X	X	X	X	X	X	X	X	X	X
Expenditure and cost									X		
Efficiency	X		X	X	X	X	X	X	X	X	X
Equity		X	X	X	X	X	X	X	X		X
Governance	X							X			
Patient-centeredness, patient focus and responsiveness	X	X		X	X	X		X	X	X	
Safety		X	X	X	X			X	X	X	X
Sustainability				X	(X)					X	
Timeliness		X			X			X			

# SECTION 2. RATIONALE AND METHODS FOR HEALTH SYSTEM PERFORMANCE ASSESSMENT IN ESTONIA

Estonia has positive trends towards increasing life expectancy, decreasing infant and adolescent mortality; a limited prevalence of chronic conditions; and health care services with a relatively high level of efficiency and cost-effectiveness. However, Estonia's health system also faces several serious challenges. Life expectancy at birth is still lower than the European Union (EU) average with important sex and regional inequalities in life expectancy. Continuing urbanization and the ageing of the population followed by an increase in the number of people with chronic conditions are also expected to lead to issues related to access to health care. There is also room for improving performance in promoting healthy lifestyles, since only about one third of the population reports having a healthy lifestyle. Further, Estonia needs to improve control of and response to the effects of the high rates of HIV infection and related conditions, improve regulation of providers to ensure better public accountability and sustain health expenditure and human resources at levels that ensure timely access to high-quality care (15). Finally, the drastic changes in the current economic context and the pressure of public deficits induce the risk that governments will disinvest in health, which would increase: out-of-pocket payments;<sup>1</sup> catastrophic health expenditures for the people with the lowest incomes; and inequalities in health outcomes and access to health services. In turn, if the health situation of the population and related demographics deteriorates, it will negatively affect the workforce when the economy starts to recover from this period of hardship.

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1 Out-of-pocket payments are payments for services required at the time the service is delivered. These include, for example, co-payments, payments for medication and payments for diagnostic tests. They do not include private payments for insurance premiums. However, these private payments would be included in total private health expenditures.

## Rationale for health system performance assessment in Estonia

In June 2008, the 53 Member States of the WHO European Region met in Tallinn for the WHO European Ministerial Conference on Health Systems, Health and Wealth and endorsed the Tallinn Charter: Health Systems, Health and Wealth (16). The purpose of the Tallinn Charter is to improve people's health by strengthening health systems while acknowledging the social, cultural and economic diversity across the Region (see Box 1). As part of the Charter, the Member States committed themselves to promoting transparency and being accountable for health system performance to achieve measurable results (see Box 2). A first step the Tallinn Charter (16) suggested was for Member States to develop regular processes for assessing the performance of their health systems.

The rationale for investing in this assessment function is that:

- health system performance assessment can ensure that the health system has a strategic direction focusing on improving health outcomes for the population;
- policy decisions are informed by appropriate intelligence on health problems and their determinants;
- all government policies contribute to better health and healthy public policies are promoted across all aspects of government; and
- the relationships between all health stakeholders are regulated in a context of transparency and accountability, which is an important condition for improving performance.

### Box 1. Values and beliefs outlined in the Tallinn Charter (16)

- Investing in health is investing in human development, social well-being and wealth;
- It is unacceptable that people become poor as a result of ill health;
- Health systems are more than health care and include disease prevention, health promotion and efforts to influence other sectors to address health concerns in their policies;
- Well-functioning health systems are essential to improving health, and strengthened health systems save lives; and
- Health systems need to demonstrate good performance.

## Box 2. The commitments of the Member States of the WHO European Region

The Member States committed themselves to:

- promote shared values of solidarity, equity and participation through health policies, resource allocation and other actions, ensuring due attention is paid to the needs of the poor and other vulnerable groups;
- invest in health systems and foster investment across sectors that influence health, using evidence on the links between socioeconomic development and health;
- promote transparency and be accountable for health system performance to achieve measurable results;
- make health systems more responsive to people's needs, preferences and expectations, while recognizing their rights and responsibilities with regard to their own health;
- engage stakeholders in policy development and implementation;
- foster cross-country learning and cooperation on the design and implementation of health system reforms at national and subnational levels; and
- ensure that health systems are prepared and able to respond to crises and that we collaborate with each other and enforce the International Health Regulations.

This report is a joint effort of the Ministry of Social Affairs of Estonia and the WHO Regional Office for Europe. It presents the evidence supporting health system performance assessment, an initial set of indicators with related findings and reflections on how to strengthen accountability in order to stimulate health system performance improvement. There is already ample evidence about the strengths and weaknesses of Estonia's health system. Several reports have been developed in recent years to analyse and strengthen specific areas of Estonia's health system. This includes work on pay for performance (17), health system, health insurance fund and hospital governance (18), evaluations of programme implementation and performance in selected areas (19–21) and a review of the health system (15). However, none of this work has provided an overall assessment of the performance of the health system. The aims of this report are therefore to provide an overview of the performance of the Estonia's health system, to consolidate the existing evidence in a way that lends itself to use by decision-makers and health system stakeholders and to set the stage for further development and integration of health system performance assessment within the decision-making process of the Ministry of Social Affairs.

This report presents the evidence supporting the use of health system performance assessment in different national contexts and the methods used to carry it out in Estonia, including the framework for measuring performance and the set of performance indicators selected. It discusses findings for each of these performance indicators, dimensions and the links that can be drawn between the different performance dimensions of the framework. Finally, it discusses accountability for performance improve-

ment on key areas of performance, and proposes possible next steps for managing health system performance more systematically.

## **A brief description of the Estonian health system**

Estonia, with a population of 1.34 million in 2008, is a democratic parliamentary republic and has, since 2004, belonged to the North Atlantic Treaty Organization (NATO) and the European Union (EU). Since regaining independence in 1991, the political environment has been stable enough to implement various economic and social reforms that aim to further ensure stability in Estonia.

The birth rate has increased since the late 1990s but is still lower than the death rate. The life expectancy in 2008 for women was 79.2 years and for men 68.6 years, one of the largest gaps between men and women in Europe. Life expectancy for both sexes, which is lower than the respective EU averages, has been steadily increasing since 1999.

The main challenge in reducing the burden of disease is premature mortality caused by external causes as well as lifestyle-related risk factors. The working-age population bears more than half of the current avoidable burden of disease. The main risk factors leading to ill health are related to tobacco use, alcohol consumption, low levels of physical activity and unhealthy nutrition with the last two factors leading to increased obesity rates. Although tobacco use is declining among adults, rising alcohol consumption among adolescents is a worrying trend. Other positive trends over the past decade include high vaccination rates and decreasing incidence rates of communicable diseases such as tuberculosis. The most serious challenge facing Estonia's health system in the area of communicable diseases is the high rates of HIV incidence (which peaked in 2001) and related prevalence.

### **Organization and regulation**

The Ministry of Social Affairs is the steward of the health system in Estonia. The organizational structure in the health system is advanced and, as of 2008, comprises numerous actors, including various agencies under the Ministry of Social Affairs (such as the State Agency of Medicines, the Health Care Board, the National Institute for Health Development, and the Health Protection Inspectorate); public independent bodies such as the Estonian Health Insurance Fund (EHIF); private primary care units and (mainly publicly owned) hospitals under private regulation; and various nongovernmental organizations (NGOs) and professional associations. Other (non-health) sectors

such as transport, economy, agriculture, and environment have started to be more actively involved in health system activities due to the measurement of performance and the implementation of intersectoral public health strategies (such as the HIV/AIDS strategy or strategies on cardiovascular diseases). In this environment, with many stakeholders and diverging responsibilities, a correct balance between the stewardship role, direct control mechanisms, good governance and proper accountability is continually sought within the Ministry of Social Affairs and within the health system.

Fundamental reforms aiming to develop a modern health system took place in the early 1990s. These were followed by a legislative review during 2000–2003 that addressed various areas including health financing, service provision and regulation of relationships between health system actors such as purchasers, providers and patients. Since 2004, intersectoral public health strategies have been prepared, launched and implemented. In recent years, regulations have been adjusted further to harmonize with EU legislation and to respond to emerging needs. In order to set a clear vision for the future and bring the various initiatives under one umbrella, a National Health Plan covering the whole health system for the period 2009–2020 was approved by the Government in July 2008.

## Financing

Estonia's health care is mainly publicly funded through solidarity-based mandatory health insurance contributions in the form of an earmarked social payroll tax, which amounts to almost two thirds of total health care expenditures. The Ministry of Social Affairs is responsible for funding emergency care for uninsured people, as well as for ambulance services and public health programmes. The municipalities have a relatively small, yet diverse role in health financing. Private expenditures comprise about one quarter of all health care expenditures, mostly the direct out-of-pocket payments in the form of co-payments for pharmaceuticals and coverage of dental care. This growing out-of-pocket expenditure may hinder access to health care for low-income population groups and has made health care funding more regressive in recent years.

The Estonian Health Insurance Fund is the core purchaser of health care services for insured people. The health insurance system covers about 95% of the population. Contributions are related to employment, but the share of non-contributing individuals covered (such as children and pensioners) represents almost half the insured people. In the long term, this threatens the financial sustainability of the health system, as the narrow revenue base is mostly related to wages and the population is ageing. This could be complicated by downturns in economic activity. In recent years, steps have been taken to increase population coverage as well as the revenue base, but

the impact of these steps is still marginal. Until 2008, more resources were allocated to both health care and public health but further fragmentation of funding sources needs to be closely monitored and avoided.

Health services purchasing builds on a contractual relationship with providers as well as financial incentives. Contracts and procedures to involve providers in negotiations have been developed continually and, similarly, new payment mechanisms have been introduced. For hospitals, a diagnosis-related group (DRG) system has been implemented since 2004, complementing the fee-for-service payments and those related to bed-days. With regards to primary care services, age-adjusted capitation, fee-for-service payments for selected areas and basic allowances have been complemented by a quality-based bonus system, implemented in 2006, which aims to promote disease prevention and the management of selected chronic conditions. Further discussions on how to stimulate the performance of the providers have been ongoing in recent years.

### **Physical and human resources**

Estonia inherited from the Soviet era a large, ineffective hospital network with poor facilities. Various structural and managerial reforms in the 1990s reduced the number of hospitals (and beds) and restructured the network of health care services providers. The reforms aim to modernize the network and enable the provision of high-quality services while also ensuring sufficient access to health services. This process of modernizing the current facilities is ongoing and is supported by various resources, including those from the EU Structural Funds. Estonia has developed a well-equipped infrastructure for primary care that builds on family physicians and nurses.

One university provides medical education for doctors, and education for other professionals (including nurses) has been centralized to a few schools to ensure a higher quality of training. The curricula for health specialists and workers were reviewed in the 1990s and were harmonized with EU law in anticipation of the 2004 accession. Since the health care sector has a general lack of human resources, long-term planning and increasing training for nurses and doctors have been strongly emphasized. EU membership in 2004 led to a temporary emigration spike of doctors and nurses migrating to neighbouring EU countries. In recent years, however, emigration has decreased and the main challenges are to retain qualified professionals in the health care sector, along with the ageing of the current workforce.

The period since the mid-1990s can also be characterized by great investments in information and communication technologies. This has led to e-health solutions that



aim to achieve better coordination, improved access and transparency. Since 2005, a countrywide e-health approach encompasses four innovative pillars: electronic health records, digital registration, digital imaging and digital prescriptions.

### Provision of services

Reforms that started in the early 1990s in health care introduced the principles of purchasers and providers split; strengthening primary care; free choice of provider; and a high level of provider autonomy. As a result, the system is based on a country-wide primary care level centred on family medicine, with specially trained doctors and nurses. The aim is to provide both curative and preventive services by teams led by family physicians. Further, primary care is supported by ambulance services with health care teams (including a doctor) available all over Estonia.

Specialized care has increasingly been provided in outpatient settings, and care involving high technology has been increasingly centralized to key hospitals. Further, over the years, the availability of and access to pharmaceuticals has increased significantly. The increasing importance of public health services has led to the measurement of the performance of services and standards, raised the awareness of the population and enhanced the public health approach to health care services. Further initiatives have been implemented to improve access to and quality of health care services, including: opening a 24-hour primary care call centre in late 2005; widening the scope of services; introducing financial incentives as quality bonuses in primary care services; voluntary accreditation of professionals by their associations; introducing handbooks on quality in hospitals and clinical guidelines. In relation to both access and quality, the coordination of and approach to tackling chronic conditions are continuing concerns. Several additional topics need further attention, most noticeably patient empowerment, self-care, and performance measurement in home care and long-term care services.

## The National Health Plan 2009–2020

The National Health Plan 2009–2020 outlines priorities based on values such as human solidarity, equal opportunity and justice, access to high-quality health care services and empowering civil society. These values are consistent with the values of the WHO European Region Member States (22). The general objective of the strategy is to increase the number of healthy years of life by reducing mortality and morbidity rates. The strategy defines five thematic areas, focusing on the increase in social cohesion and equal opportunity, ensuring the healthy and safe development of children,

developing a health-supportive environment, promoting healthy lifestyles and securing the sustainability and quality of health care. To monitor progress, performance indicators have been identified and targets defined for four consecutive four-year cycles leading to 2020.

### **Increasing social cohesion and equal opportunities**

Social cohesion means the capacity of a society to ensure the welfare of all its members, minimize disparity and avoid exclusion. Cohesion is directly related to health – better cohesion means better health status. The existence of excluded groups is a major public health risk, while equal opportunities and equal access to services increase social security and cohesion and improve health indicators. The priority courses of action in this area are to reduce social disparities in health and empower groups and communities.

### **Ensuring the healthy and safe development of children**

Childhood and adolescence create the foundation for health-conscious and healthy behaviours. Health is influenced by family relations, living conditions, local natural and artificial environment, nursery school and school environment as well as the general socioeconomic environment, including the organization of education and health care and the levels of employment and poverty in the country. Priorities for this area are: developing the physical and mental health and social development of children and adolescents; preventing injuries and violence among children and adolescents; and preventing chronic diseases and the associated risk factors among children and adolescents. The objective is to reduce child and adolescent mortality and primary morbidity due to mental and behavioural disorders and that young people report increasingly positive assessments of their health.

### **Developing a health-supportive environment**

The priority courses of action in this area are:

- raising the awareness of various target groups on the health risks from the living, working and learning environments and the risk management measures;
- improving the system for evaluating, managing and notifying health risks from the living, working and learning environments;
- improving the level of national preparation for preventing the spread of infection diseases, epidemics and pandemics;

- improving monitoring in the living, working and learning environments; and
- improving occupational health procedures and significantly improving the quality of occupational health services, ensuring that these services are available to all employees.

### Promoting healthy lifestyles

The risk factors associated with diseases and injuries are often interlinked and preventing them should therefore be approached in an integrated manner. The main behavioural health-related factors include limited physical activity, imbalanced nutrition and risky behaviours. Priority courses of action in this area are:

- developing health-supportive social norms and values in Estonia;
- increasing the involvement of the private sector (including the mass media) and NGOs in creating an environment that facilitates healthy choices; and
- creating a health-supportive environment for children and adolescents by increasing the effects of protective factors.

### Ensuring the sustainability and quality of health care

Improving health care implies ensuring the availability of high-quality services that meet the needs of the people and are delivered in a cost-effective manner. Priority courses of action are that:

- health care services must be fair, ensuring the availability of high-quality health care services through the optimal use of resources;
- health care services employ qualified and motivated health care workers who focus on patients;
- health care services are funded according to the health insurance solidarity principle, ensuring equal access to and quality of health care services to everyone with health insurance; and
- the financing system must be sustainable in the long term in order to ensure the availability of services and to protect people from financial risks.

## Methods for assessing health system performance in Estonia

The scope of this health system performance assessment is broader than the monitoring of the National Health Plan 2009–2020 in the sense that it covers not only health system goals but also efforts to strengthen the health system, leading to better health system outcomes. Further, this report is a first step towards regular reporting by the Ministry of Social Affairs on health system performance assessment, which will include the monitoring of performance indicators and targets attached to the National Health Plan.

The aims of the first health system performance assessment report for Estonia are:

- to provide a framework for health system performance assessment consistent with the principles and commitments of the Tallinn Charter;
- to define a set of indicators for health system performance assessment, linked to the reporting commitments of the Ministry of Social Affairs to the targets of the National Health Plan 2009–2020;
- to identify areas in which performance measurement could be improved and propose new performance indicators for future collection and calculation;
- to pinpoint areas in which the performance of the health system needs to be improved; and
- to illustrate relations between health system performance assessment accountability in order to drive action for performance improvement in the future.

## Methods for developing the health system performance assessment framework

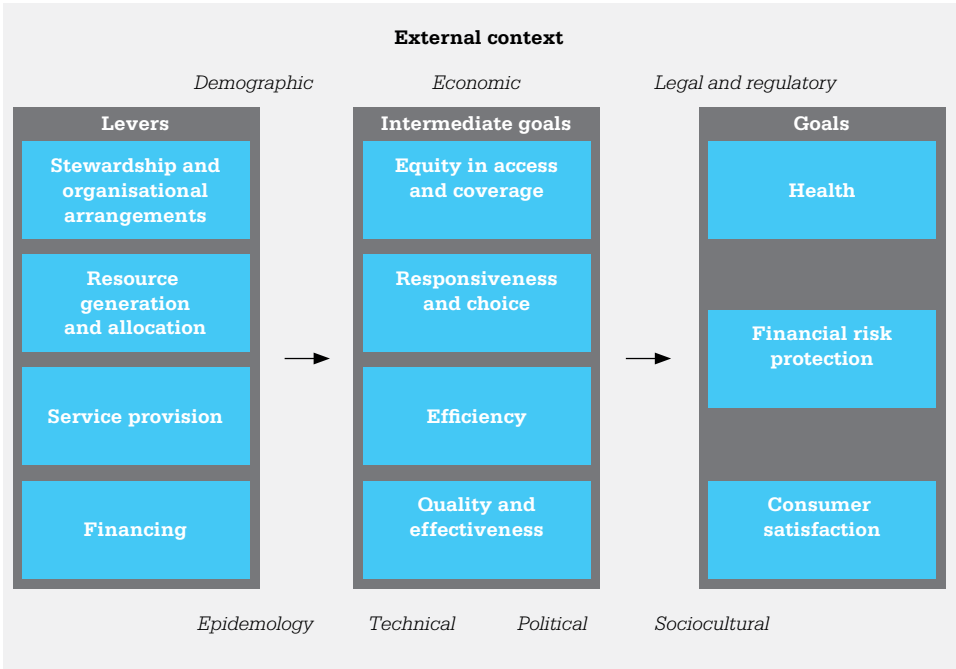
The working group set up between the Ministry of Social Affairs and experts from the WHO Regional Office for Europe mapped the different performance dimensions of the Population Health Strategy (Table 3) with performance dimensions identified in the World health report 2000 and the WHO 2007 health system framework (1,2) and on this basis developed a framework for health system performance assessment.

**Table 3. Mapping of the National Health Plan 2009–2020 with health system performance dimensions**

Strategic directions of the National Health Plan	Correspondence with performance dimension
<ul style="list-style-type: none"> <li>• A general objective of the strategy is to increase the number of healthy years of life by reducing mortality and morbidity rates</li> </ul>	Health status (level and distribution)
<ul style="list-style-type: none"> <li>• Increase social cohesion and equal opportunities: priority courses of action are to reduce social disparity in health and to empower groups and communities</li> <li>• Securing the sustainability of Estonia's health care: the health care sector must employ qualified and motivated health care workers who focus on patients</li> </ul>	Health system responsiveness
<ul style="list-style-type: none"> <li>• Ensuring the sustainability of the health care:               <ul style="list-style-type: none"> <li>» health care funding must be sustainable in the long term</li> <li>» the health care must be fair</li> <li>» health care is funded according to the health insurance solidarity principle</li> <li>» the related strategic objective is that all people have access to high-quality health care services through optimal use of resources</li> </ul> </li> </ul>	Fair financing, financial protection and coverage Health system efficiency and effectiveness Access to health care services Quality and safety of health care services
<ul style="list-style-type: none"> <li>• To ensure healthy and safe development of children, priority courses of action are developing physical and mental health and social development, preventing violence and injuries and preventing chronic diseases and the associated risk factors among children and adolescents</li> <li>• A related strategic objective is to increase physical activity among the population, improve nutrition and reduce risky behaviour</li> </ul>	Health behaviour and health promotion
<ul style="list-style-type: none"> <li>• Social cohesion is directly related to health – the existence of excluded groups is a major public health risk, while equal opportunities and equal access to services increase social security and cohesion and improve health indicators</li> <li>• A priority course of action is raising awareness of different target groups of the health risks in the living, working and learning environments and the risk management measures</li> <li>• A priority course of action is improving occupational health procedures and significantly improving the quality of occupational health services, ensuring the availability of these services to all employees</li> </ul>	Broader determinants of health

Based on the results of the strategy mapping described in table 3 above, the experts group developed a framework for assessing health system performance in Estonia, presented in Fig. 1.

**Fig. 1. Framework for assessing health system performance in Estonia**



Source: adapted from Atun (23).

**Methodological issues related to health system performance measurement**

In addition, the working group selected a balanced set of performance indicators reflecting the performance measurement framework; collected the data and calculated the performance indicators; and interpreted the results with the support of national and international health system performance experts. The collection of data took place during the first semester of 2009, therefore the report may not present the most updated data for all performance indicators at the time of publication.

In developing this health system performance assessment, the working group attempted to apply the main requirements of a sound performance measurement system (8): (i) definitions of performance indicators should be clear, consistent and fit into a clear conceptual framework; and (ii) individual performance indicators should: aim to provide information that is relevant to the needs of specific actors; attempt to measure performance that is directly attributable to an organization or actor; aim to be statistically sound, easy to interpret and unambiguous; and be presented with a full acknowledgement of any data limitations.

There are numerous ways to determine indicators that might be used to measure health system performance. However, regardless of the method used, an indicator should not be considered to be a true measure of the phenomenon for which it has been chosen. The indicator merely varies coherently with the state of the phenomenon of interest. Indicators are measures constructed to be comparable over time and across jurisdictions, and can be markers of health status, service performance or resource availability. They measure important phenomena that often can be interpreted more broadly than the specific measure. For example, infant mortality rates are often used to gauge the overall performance of a country's health care. In interpretation, health status and system performance measures can be interdependent.

Health status and health system performance measures are often treated separately. But while these indicators provide different perspectives, they must be considered together to determine whether population needs are being adequately addressed. Health status indicators help to identify the burden of disease and factors that are associated with health care needs, while system performance measures show the character and capacity of factors associated with providing care. Although there is value in examining these types of indicators separately, a policy perspective seeks to understand the dynamic between population health status and the health system indicators.

### **Health status indicators**

Health status indicators do not directly measure the performance of a health system. These indicators measure aspects of population health, which are influenced by many factors outside the formal health care. These factors, which are often referred to as population health determinants, include: the social, economic and physical environments; personal lifestyle choices and practices; individual capacity and coping skills; human biology; early childhood development; and the quality and accessibility of health services (24). However, health status indicators can be used to reflect the impact of health system programmes and services. For example, infant mortality is often used as an indicator of health system performance for low- and medium-income countries.

### **Health system indicators**

Health system indicators are intended to reflect several aspects of the quality of health services, including appropriateness, effectiveness, accessibility and acceptability. Access and appropriateness indicators, including measures of waiting time and service utilization, reflect the capacity of health care to provide appropriate and timely treatment and care according to needs. Effectiveness indicators such as re-admission rates; and the incidence of preventable diseases and risk conditions

measure the success of health care programmes and services in achieving desired clinical and behavioural outcomes. Acceptability and patient satisfaction measures indicate the extent to which the health care is able to meet the needs and expectations of individuals.

System indicators can be further divided, as they may focus on particular functional aspects related to the delivery of care.

- Performance and quality indicators are health system indicators that are designed to track specific dimensions of the health services system such as how satisfied patients are with the services received.
- Structural indicators provide descriptive information such as the number of beds in a facility, or the number of health professionals employed within an organization.
- Process indicators are commonly used to improve management and quality. For example, waiting times may be considered a process indicator, as would the application of evidence-based clinical practice guidelines.
- Output indicators are among the most often cited measures. These reflect the amounts of activity recorded, such as surgical procedures performed or meals delivered.
- Outcome indicators may be difficult to relate directly to the actions of the health care but still measure health system goals. Mortality rates and measures of population health are outcome indicators often used to reflect the accomplishments of the health system.

All indicators have strengths and weaknesses and should be considered as a whole rather than individually. The extent to which particular health outcomes are attributable to health programmes and services is difficult to assess based on indicator data alone. Where possible, indicators should be selected when the link between particular interventions and effects on health outcomes has been well established. This can be accomplished by positioning indicators within a well-defined framework. Further, the existence of putative causal relationships between indicators strengthens the model used, and the consequent interpretation of those indicators.

Table 4 presents the set of performance indicators selected for the first health system performance assessment.



## **Assessing the coverage of performance indicators and gaps in performance measurement**

The conceptual framework of performance dimensions and subdimensions identified for Estonia was used as the basis for selecting performance indicators – the indicators should measure aspects of health system performance related to the conceptual framework. As discussed earlier, although an indicator does not truly measure the phenomenon for which it has been chosen, the goal is to have performance indicators that vary coherently with the level of performance of the health system. Indicators should be methodologically defined so that results can be compared over time within a given health system, and ideally compared across health systems.

However, health data may not be collected consistently, in a timely fashion, or with complete coverage; or the data may not be collected at all. Considerations related to the quality and availability of data place practical limitations on the use of performance information. Depending on the existing infrastructure for health information, these limitations may mean that some performance dimensions may have sparse coverage through indicators that can be used for assessing performance. This applies to the health data resources available for Estonia, similar to many other health systems. The indicator coverage of the performance dimensions is reviewed below, highlighting gaps in current indicator availability and also whether reliable cross-country comparisons can be made.

**Table 4. Performance indicators selected for the first health system performance assessment in Estonia**

Performance dimension	Performance subdimension (if any)	Policy questions addressed	Performance indicators
Health status (level and distribution)	Life expectancy	How healthy are Estonians?	<ul style="list-style-type: none"> <li>• Change in life expectancy at birth in Estonia, by sex</li> <li>• Male and female life expectancy at birth in selected European countries</li> <li>• Changes in life expectancy 2000 versus 2008 attributable to different disease groups</li> <li>• Disability-free life expectancy</li> </ul>
	Life expectancy without disabilities	How many years do Estonians live without disability?	
	Self-assessed health	How do Estonians assess their health?	<ul style="list-style-type: none"> <li>• Self assessed health</li> </ul>
	Changes in mortality rates	What are the main challenges and opportunities for improvement?	<ul style="list-style-type: none"> <li>• Infant mortality rate</li> <li>• Child mortality rate</li> <li>• Avoidable mortality</li> <li>• Potential gains in life expectancy in days if avoidable mortality were avoided in 2008</li> </ul>
	Burden of disease	How many life-years do Estonians lose due to premature mortality and ill health?	<ul style="list-style-type: none"> <li>• Main disease groups causing the burden of disease</li> <li>• Regional levels of the burden of disease (disability-adjusted life-years per 1000 persons)</li> </ul>
Health behaviour and health promotion		How well is the health system performing in keeping people healthy?	<ul style="list-style-type: none"> <li>• Immunization rates of two-year-olds with national immunization calendar vaccines</li> <li>• Proportion of daily smokers aged 15+ years</li> <li>• Consumption of pure alcohol per person</li> <li>• Overweight</li> <li>• Prevalence of overweight and obesity</li> <li>• Physical activity</li> </ul>

Performance dimension	Performance subdimension (if any)	Policy questions addressed	Performance indicators
Broader determinants of health	Social determinants of health	How is Estonia's health system doing with regards to broader social determinants of health?	<ul style="list-style-type: none"> <li>• Level of education</li> <li>• Unemployment rate</li> </ul>
	Environmental health	Are there environmental health issues that threaten the health of Estonians? Can they be reduced?	<ul style="list-style-type: none"> <li>• Percentage of population having access to clean drinking-water</li> <li>• Average concentration of small particles in the air in cities</li> </ul>
Responsiveness of the health system	Occupational health	Are there occupational health issues threatening the health of Estonians and can they be reduced?	<ul style="list-style-type: none"> <li>• Incidence of occupational diseases</li> <li>• Deaths from work-related accidents</li> </ul>
		How responsive is Estonia's health system in terms of respect for people and a client orientation?	<ul style="list-style-type: none"> <li>• Satisfaction with the health care</li> <li>• Satisfaction with the quality of health care services</li> <li>• Satisfaction with access to health care services</li> <li>• Satisfaction with hospital care and primary care during the last visit</li> <li>• Satisfaction with health care benefit package</li> </ul>
Fair financing, financial protection and coverage	Health system expenditures	Is the level of health expenditure sufficient and sustainable?	<ul style="list-style-type: none"> <li>• Government spending on health compared with overall government spending</li> <li>• Out-of-pocket and other private expenditure on health as a percentage of total health expenditure</li> <li>• Government spending on health as a percentage of gross domestic product (GDP)</li> <li>• Out-of-pocket payments as a percentage of GDP per capita</li> </ul>
	Fairness of health system financing in Estonia	Is the burden of financing for health borne proportionally more by the wealthier people in Estonia?	<ul style="list-style-type: none"> <li>• Sources of health care financing as a percentage of total health care expenditures.</li> </ul>
	Protection against the financial risk of ill health	Is the health system protecting the poorest people against the financial risk of ill health?	<ul style="list-style-type: none"> <li>• Total household out-of-pocket payments and as a percentage of total household expenditure by income quintile</li> <li>• Proportion of households impoverished due to out-of-pocket payments</li> </ul>
	Health system coverage	Do Estonians have universal health care coverage?	<ul style="list-style-type: none"> <li>• Total population health service coverage (no figure)</li> </ul>

Performance dimension	Performance subdimension (if any)	Policy questions addressed	Performance indicators
Efficiency and effectiveness of the health system	Technical efficiency	Is Estonia's health system technically efficient?	<ul style="list-style-type: none"> <li>• Hospital beds per 1 000 000 population</li> <li>• Average length of stay, all hospitals</li> <li>• Bed occupancy rate (%), acute care hospitals only</li> <li>• Physicians per 100 hospital beds</li> </ul>
	Allocative efficiency	Are health system resources allocated in a way that promotes better health system value?	<ul style="list-style-type: none"> <li>• Primary health care and inpatient expenditure compared with total health system expenditure</li> <li>• GPs and specialist: physicians per 100 000 population</li> <li>• Ratio of nurses to physicians</li> <li>• GP utilization versus hospitalization rate</li> </ul>
	Overall health system efficiency	Is the health system effective in using its resources?	<ul style="list-style-type: none"> <li>• No indicator available</li> </ul>
Access to health care services	Utilization of health care services	Are those needing care able to access services when they need them?	<ul style="list-style-type: none"> <li>• Rates of inpatient admissions and outpatient contacts</li> <li>• Average hospital waiting times for inpatient, outpatient and ambulatory care</li> <li>• Distribution of waiting times for hospital inpatient care in large Estonian hospitals as of July 1, 2009</li> <li>• Reported waiting times for specialist services</li> <li>• Reported waiting times for access to General Practitioners</li> </ul>
	Equity in utilization of health care services	Does the system provide health care equitably to all residents of the country?	<ul style="list-style-type: none"> <li>• Percentage of population reporting problems accessing dental care by income quintile</li> <li>• Relationships between standardized mortality rates compared with hospitalization rates</li> <li>• Relationships between standardized mortality rates compared with GP contacts</li> </ul>
Quality and safety of health care services		During their interaction with the health care are patients receiving care of sufficiently high quality?	<ul style="list-style-type: none"> <li>• Hospital readmission rates for acute myocardial infarction and for asthma</li> </ul>

## Health status of Estonians: level and distribution

Many diverse measures are available for assessing overall health status in Estonia, including life expectancy and life expectancy adjusted for disabilities, self-assessed health and mortality and morbidity information. The data sources used allow several of the indicators to be analysed and stratified. Indicators related to mortality can be trended back much more than two decades; historical results for self-assessed health are available, but can only be tracked back to 2002. Many of the health status measures are reported internationally using standard definitions, and good databases are available for reviewing results for other countries or groups of countries. There are significant lags in the availability of results for other health systems: for example, burden of disease results are only available for 2006. Further, some of the specialized analyses, such as projected gains in life expectancy through eliminating avoidable mortality, cannot be duplicated for other health systems. Overall, the information available and the indicators used provide a good ground for assessing performance in this dimension. Stratifications by regions, income and education groups or other strata could be developed further.

## Health behaviour and health promotion

Indicators for assessing some of the most critical health risk factors – such as smoking and alcohol consumption – are available for Estonia and can be tracked over two decades. In addition, information about the prevalence of overweight and obesity is also available, although data are available only from 2002. Data are also available to examine these indicators for specific age groups and for males and females. International comparisons for smoking, alcohol consumption and overweight and obesity are also easily obtained. However, some key aspects of health behaviour cannot be measured or are difficult to compare across health systems, such as dietary habits and levels of physical activity. Further, although average alcohol consumption as an indicator provides trend and comparative information about overall levels of consumption, it does not address the issue of abuse of alcohol (i.e., based on the distribution of consumption), which is the behaviour of interest for this risk factor.

## Broader determinants of health

Assessing broader determinants of health requires indicators on three subdimensions at least – social determinants, environmental factors and occupational health. For education and employment status, there is long-term information for Estonia and comparable information from other countries. For environmental factors, measures of clean water supply and air pollution, the average concentration of particles is available, but Estonia lacks consistent international indicators for clean water supply and ideally needs indicators of other aspects of air quality to obtain a fuller picture of how this

affects short- and long-term health status. For occupation-related mortality in Estonia, information has been available for at least two decades and can be compared with the results of other countries. For occupation-related morbidity, however, reporting appears to be inconsistent over time and may not be comparable to international results or across several years. Moreover, socioeconomic strata for other indicators are often not routinely available.

### **Health system responsiveness**

Survey data on health system responsiveness are available from 2000. The surveys report on the perceptions of health system users about characteristics such as access to care, perceived quality of services and the adequacy of the health care benefit package. Although other health systems may survey similar concepts, differences in methods and survey tools used often make these results difficult to compare directly. Estonia also has gaps in the coverage of responsiveness related to dignity, such as the degree of autonomy and confidentiality in the health system and existing measures of perceived quality are very subjective in nature and probably related to what people have learned to expect.

### **Fair financing, financial protection and population coverage**

Estonia has good information on health system financing, especially about the patterns of public health system expenditures. These results have been tracked over several years, and standards ensure that international reporting of health and other government expenditures is consistent. There is also good information on out-of-pocket payments and how health care spending affects household incomes. This information is provided through indicators derived from standard surveys of household incomes and expenditures and is reported regularly. However, indicators related to population coverage for health services are not available for tracking or international comparisons.

### **Health system effectiveness and efficiency**

Assessing allocative efficiency in Estonia is difficult without national targets and specific policies for allocating health system expenditures. Several indicators can be used to assess the technical efficiency of the health system over the last several years, with international comparators available for the hospital sector. Measures of efficiency for other sectors such as primary health care, long-term care, mental health care and pharmaceuticals, etc. are lacking in Estonia and in most other countries. Thus, for example, primary health care expenditures are increasing, but indicators are lacking to show whether this increased expenditure has been beneficial. Developing indicators of health system effectiveness, or value for money has been a challenge across all health systems (25,26). Indicators of value for money provide information

that could potentially help to focus policy-makers' attention on what the health system is delivering for the resources put into it.

### **Access to health care services**

Indicators of true access to health care services are also difficult to develop, as ideally they require accurately defining the population that would benefit from a service and analysing who could actually access services. This report uses two data sets to indicate access in Estonia: rates of utilization by subgroup, which are available for several years and for which international comparisons are available; and waiting times, which are inconsistently measured across health systems. Rates of utilization by subgroup are a proxy for equity of access (assuming that increased utilization implies better access, but evidence of variation in treatment from other countries, especially the United States of America, has questioned whether more health care is always better (27–30). Other indicators that could be used to assess access more fully would include surveys that would report the experience of individuals with barriers to obtaining health care services.

### **Quality and safety of health care services**

Indicators for assessing the quality and safety of services in Estonia are limited. Two measures, both of which have limited historical information and possible international comparisons, were used: readmission rates following hospital discharges for: acute myocardial infarction and asthma. These indicators provide some information about the adequacy of care received in the hospital setting and the support for managing conditions in the community, but they do not reflect the end outcomes of health care services: improved quality of life and increased survival rates. Several fairly standard clinical outcome measures with international results are available that could be used to provide a better basis for assessment. The quality of care processes can also be examined through indicators reflecting the use of evidence-based clinical practice guidelines. Estonia has no indicators for the safety of health care services. Although current data sources may not provide the information required to build indicators of safety, these measures would include rates of selected adverse events (such as surgical infections and medication errors).

Based on a review of international and national experiences in health system performance assessment, Annex 1 proposes additional performance measures that could fill in some of the performance gaps identified above. These performance indicators could be further developed and collected in Estonia for future reports on health system performance assessment.

## **Conclusions: international trends, key challenges and the way forward**

Health system performance assessment varies widely across the WHO European Region. Data and quantitative indicators are produced and made public to some extent in all countries, but analysis is very often fragmented and not linked to regular and systematic accountability and performance management processes. Rather than building additional parallel systems, developing full frameworks for health system performance assessment means for most countries coordinating isolated performance measurement initiatives, complementing them, making sense of the data already available to assess performance from a health system standpoint, and informing strategic priorities. This applies to Estonia, where policy-makers already largely make use of data and performance indicators, and specific evaluation reports are available and address different policy areas. However, the performance of the health system has not yet been evaluated as a whole. Many arguments presented above, including the economic crisis, call for the timely implementation of regular assessments of health system performance in Estonia. The challenges ahead include standardizing and improving data quality. Further, it will be important to convert performance information in ways that are simple and clear to policy-makers and can be communicated effectively to the public. In addition, health system performance assessment has to be built into integrated performance management systems, through which important performance indicators are used systematically in decision-making processes across government. These processes relate to strategy and policy development, target setting, performance measurement, resource allocation and accountability enhancement and performance improvement.



# SECTION 3. FINDINGS OF THE HEALTH SYSTEM PERFORMANCE ASSESSMENT

This chapter reports on the performance of the various performance dimensions affecting health and health care in Estonia, using the data available. Where data are available, we report: performance in relation to national targets; changes over time in Estonia; comparisons with the other Baltic countries and EU countries; and distributions by county and income quintiles (from the fifth with the lowest income to the fifth with the highest income). This chapter is organized into eight main subsections and summarized in a final subsection:

- health status of Estonians (level and distribution)
- health behaviour and health promotion
- broader determinants of health
- health system responsiveness
- fair financing, financial protection and population coverage
- health system effectiveness and efficiency;
- access to health care services; and
- quality and safety of health care services

## 3.1. Health status of Estonians: level and distribution

Improving population health is the main goal of a health system. WHO defines health as a state of complete physical, social and mental well-being and not merely the absence of disease or infirmity (31). This is a positive concept emphasizing social and personal resources as well as physical capabilities. Thus, the health status of the population is the key health system dimension to be evaluated when assessing performance. This

report assesses the health status of Estonians by examining life expectancy along with the diseases and other factors that influence both the length and quality of life to identify areas for improvement to achieve longer and healthier lives for Estonians.

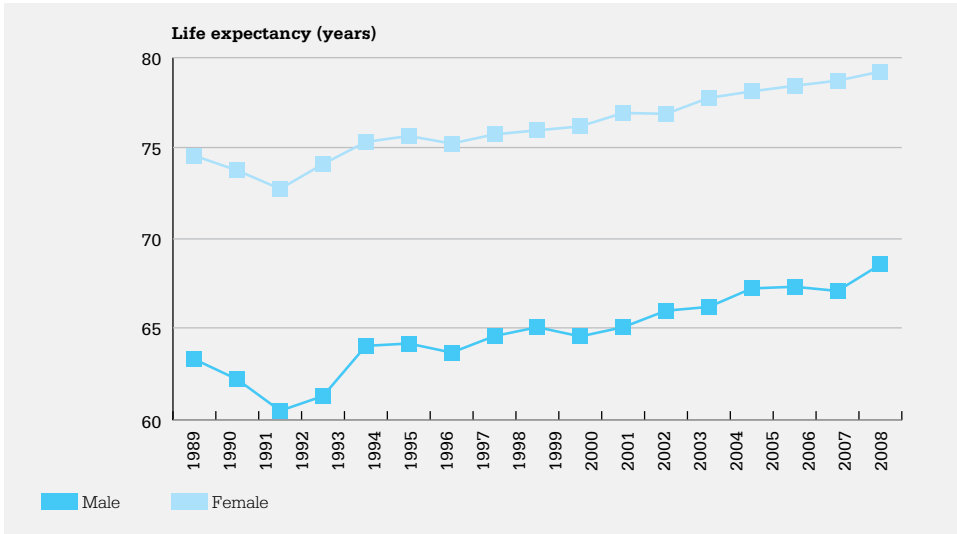
Assessment of the health status of a population should consider measures of both the average health and distribution of health in the population. The health status of a population can be measured in three dimensions: physical, social and psychological well-being. The indicators available, however, measure shortfalls in or absence of well-being: rates of morbidity and mortality for physical illness and quality of life for social and mental problems. Comparing overall health status between health systems is useful for identifying priorities for improving health systems. This section reports the health status of Estonians, giving the average and distribution for five measures: changes in life expectancy; self-assessed health; changes in child and infant mortality rates; avoidable mortality; and burden of disease.

### 3.1.1. Changes in life expectancy

#### 3.1.1.1 Crude life expectancy

Life expectancy is defined as the average number of years an individual can expect to live based on current patterns of mortality. In the mid-1990s, following the collapse of the USSR, many people in Estonia died prematurely, resulting in a dramatic fall in life expectancy at birth (Fig. 2). Life expectancy in Estonia has improved substantially during the past decade and was 74 years in 2008. The increase in average life expectancy during the past decade has reduced the gap between Estonia and the EU average to five years. Sweden is the country with the highest life expectancy in the EU, almost seven years more than in Estonia. However, these statistics for individuals mask stark and troubling differences in life expectancy between men and women in Estonia, unlike in other EU countries.

**Fig. 2** Life expectancy at birth by sex, Estonia, 1989–2008

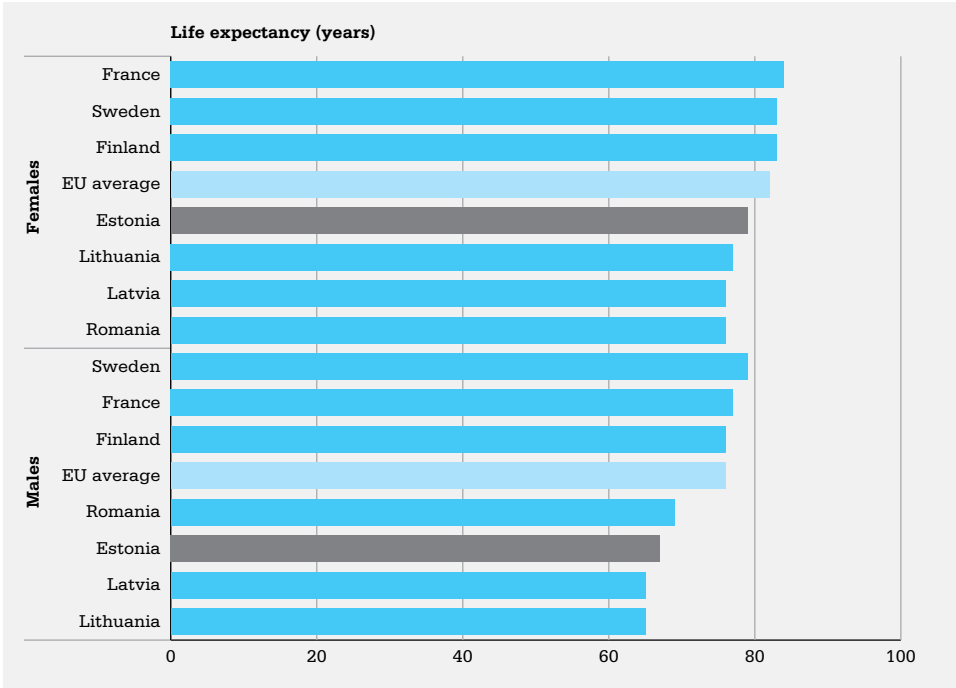


Source: Life expectancy by sex and age [online database] (32).

In Estonia, men can expect to live about 11 years less than women, and this gap has not decreased over time. By comparison, the gender gap in average EU life expectancy is about 6 years. Thus, males in Estonia are expected to live 12 years less than males in Sweden and females in Estonia 5 years less than females in France, the EU countries with the longest life expectancy for each sex (Fig. 3). This suggests that a key policy objective in improving life expectancy in Estonia ought to be directed at improving male life expectancy and reducing the gender gap between men and women.

Life expectancy also differs by educational level, nationality (the Russian-speaking population has a lower life expectancy than the Estonian-speaking population) and geographical areas. The latter two factors are related, as Ida-Viru County has the lowest regional life expectancy and is mainly Russian speaking. Differences in education exacerbate the gender gap in life expectancy. Males with primary education in particular are disadvantaged and live on average 12.8 years less than males with higher education; females with primary education live on average 9 years less than females with higher education (33).

**Fig. 3. Life expectancy at birth in Estonia, the EU and selected European countries,<sup>2</sup> by sex, 2006 or the most recent available year**



Sources: Life expectancy by sex and age [online database] (32) and Life expectancy by sex and age [online database] (34).

Between 2000 and 2008, mean life expectancy increased by about 3 years. This increase however, comprised gains (of about 3.5 years from reduction in mortality for some causes) and losses (of about 0.5 years from increases in mortality from other causes). In 2000, cardiovascular disease and injuries were the major causes of premature death.

Fig. 4 shows that reductions in mortality from these causes accounted for about half the gains in life expectancy. A main cause of lower life expectancy was mental disorders.

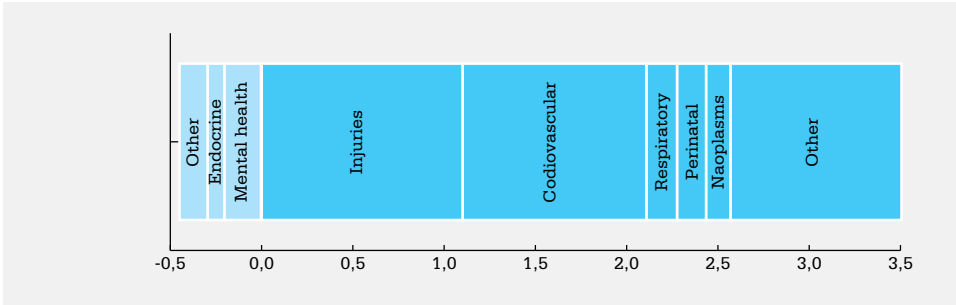
Life expectancy has increased during the past decade, but the difference in results between 2006 and 2007 indicated only marginal improvements. Even though life

<sup>2</sup> In this figure and those that follow showing results from other countries and averages, the countries with the best and worst results in the EU (and whole Europe in some cases) were selected, in addition to Estonia, the EU average and one of Estonia’s neighbouring countries.

expectancy did increase again in 2008, the interim slowdown of progress is a clear warning of possible problems. For men 20–29 years old for example, in 2007 mortality due to liver cirrhosis, alcohol psychosis, suicide and hypertension increased, effectively annulling positive effects from reduced mortality from ischemic heart disease and injuries. This highlights yet again direct links between population health and health behaviours (alcohol consumption in this case) which play a crucial role in attaining the national health targets set by the National Health Plan for 2020.

The targets for life expectancy outlined in the National Health Plan 2009–2020 (35) are 71 years for men and 80 years for women in 2012 and 75 years for men and 84 years for women in 2020. Government policies need to tackle problems of liver cirrhosis, alcohol psychosis and suicide, given the increased stress that can result from the economic crisis.

**Fig. 4. Changes in life expectancy in Estonia between 2000 and 2008 by cause of death**



Source: calculated based on: Deaths by cause of death, sex and age group [online database] (36).

### 3.1.1.2 Disability-free life expectancy

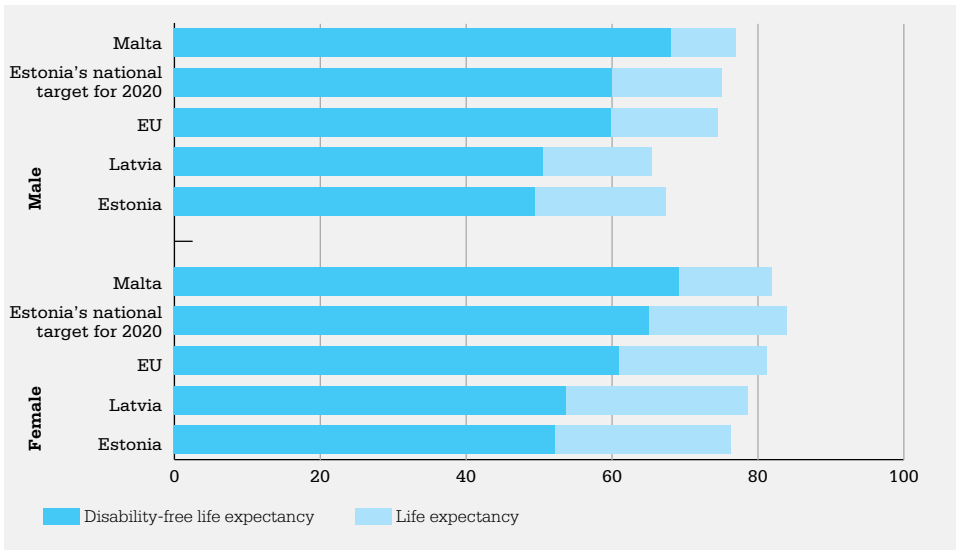
Disability-free life expectancy (or healthy life-years<sup>3</sup>) indicates the average number of years an individual is expected to live in a healthy condition given current patterns of mortality and disability, adjusting life expectancy for the quality of life. It is calculated based on estimates of life expectancy and of the portion of people in the population without functional limitations or activity restrictions. The targets for Estonia's National Health Plan for disability-free life expectancy for 2012 and 2020 are: 54.5 and 60 years for men and 60 and 65 years for women, respectively. In 2007, disability-free life expectancy for individuals in Estonia was 51.6 years, only 70% of total life expectancy.

The best-performing EU countries have a higher level of life expectancy and more than 85% of that total life expectancy, or almost 70 years, is lived without disability. Overall, the gap between disability-free life expectancy in Estonia and the best-performing EU countries is nearly 20 years. Data on this indicator are available since 2004 only, and show no improvement over time, unlike the best-performing EU countries; hence the gap in disability-free life expectancy is widening. Fig. 5 presents the disability-free life expectancy targets for males and females for Estonia for 2020 and, for 2007, the average level for the EU, Estonia and Malta (the best-performing EU country). This again highlights the poor health of males in Estonia: they have not only much shorter life expectancy than females but also a lower percentage of life expectancy free of limiting disability. Achieving the government targets for disability-free life expectancy requires new strategies to secure improvements focused on preventing disease and disability that reduce both the quality and quantity of life.

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3 Healthy life-years, also called disability-free life expectancy, is defined as the number of years that a person is expected to continue to live in a healthy condition. This statistical indicator is collected separately for men and women, both at birth and at 65 years. It is based on the age-specific prevalence (proportions) of the population in healthy and unhealthy condition and age-specific mortality information. A healthy condition is defined as no limitations in functioning and no disability. The indicator is calculated following the widely used Sullivan method. It is based on measures of the age-specific proportion of population with and without disabilities and on mortality data. Its interest lies in its simplicity, the availability of its basic data and its independence of the size and age structure of the population. However, cultural differences in reporting disability can influence the indicator (37).

**Fig. 5. Life expectancy and disability-free life expectancy, Estonia, EU and selected countries, 2006 and Estonia's targets for 2020**



Sources: National Health Plan 2009–2020 (35) and Structural indicators on health [online database] (38).

### 3.1.2. Self-assessed health

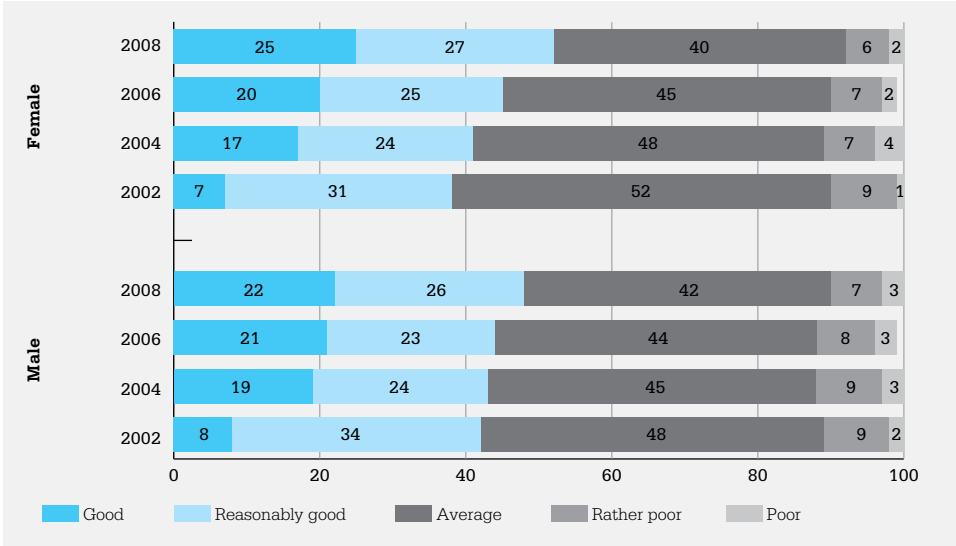
In 2008, about half of Estonians rated their health as being “good” or “reasonably good”, 40% “average” and 10% “poor” or “rather poor” (Fig. 6). This perception of health has improved significantly since 2002, with a higher proportion rating their health as “good” or “reasonably good” and a lower proportion rating their health as “average”. The international literature has often shown that men tend to assess their health better compared to women with the same condition (39). Thus it is noteworthy that currently Estonian women rate their health better than men and that improvements in self-rated health have been much faster for women.

### 3.1.3. Changes in child and infant mortality rates

The infant mortality rate is the ratio of number of deaths of infants younger than one year of age to the number of live births in the same year. The child mortality rate uses the number of deaths under five years old as a numerator and the number of children under five years old as a denominator.

The infant mortality rate is an important measure of the well-being of infants, children and pregnant women, and is associated with a variety of factors, such as maternal health, quality and access to health care, socioeconomic conditions, and public health practices. Malnutrition and lack of safe water and sanitation are the main causes of high child mortality rates at a population level. Most child mortality can be prevented by low-technology, evidence-based, cost-effective measures such as vaccines, antibiotics, micronutrient supplementation and improved family care and breastfeeding practices. Thus, this indicator reflects both public health and health care service performance, with more weight on the former. For both indicators, lower levels and a decrease over time are desirable.

**Fig. 6. Self-assessed health status among adults in Estonia, by sex, 2002–2008**



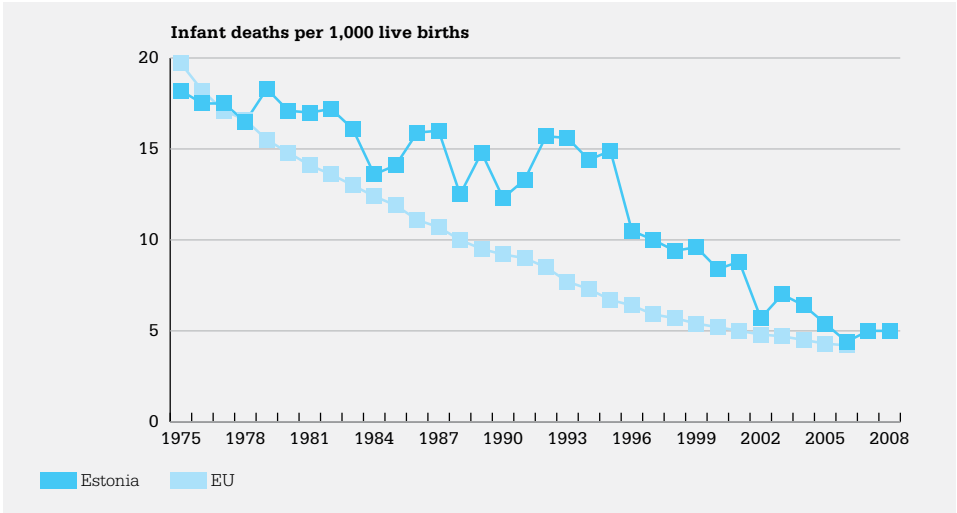
Sources: Kasmel et al. (40) and Tekkel et al. (41–43).

The most recently reported infant mortality rate for Estonia was 5.01 per 1000 live births in 2008, and the child mortality rate was 1.38 per 1000 children younger than five years in 2008. Fig. 7 and 8 show changes in both indicators over time, with increases in the mid-1990s, followed by dramatic reductions thereafter; the infant mortality rate has reached the EU average, and the child mortality rate is approaching the EU average. The National Health Plan targets (35) for infant mortality are 3.6 per 1000 live births in 2012 and 2.6 in 2020. However, the data on the infant mortality rate suggest that the downward trend stopped in 2005, and the results for child mortality are only



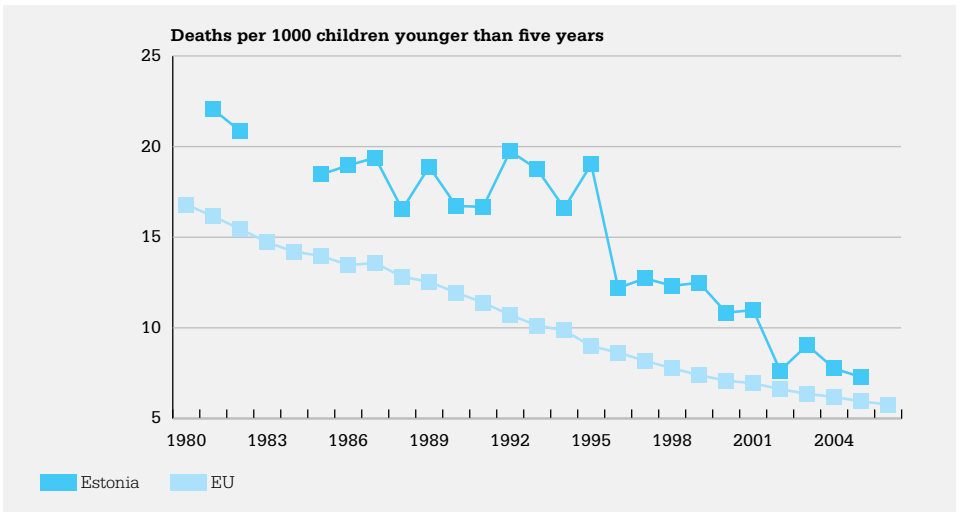
available since 2004. This suggests that new strategies will be required to achieve the targets for 2020, especially as socioeconomic conditions are likely due to the crisis.

**Fig. 7. Infant mortality rate, Estonia and EU, 1975–2007 (as available)**



Source: Infant mortality rates [online database] (44).

**Fig. 8. Child mortality rate, Estonia and EU, 1975–2007 (as available)**



Source: European Health for All database [online database] (45).

### 3.1.4. Avoidable mortality

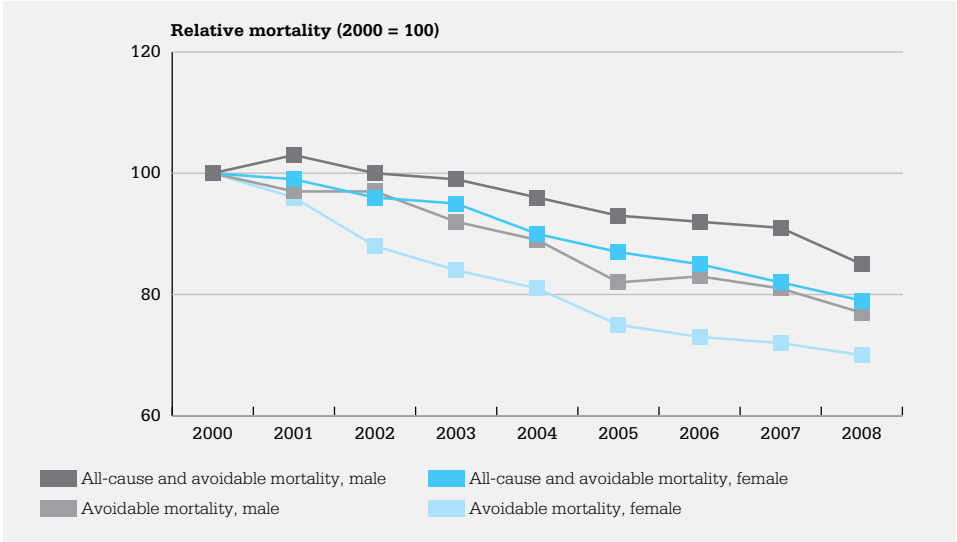
Avoidable mortality is a population-based method of counting untimely and potentially preventable deaths from diseases for which effective public health and health care interventions are available. An excess of deaths due to preventable and/or treatable causes can indicate shortcomings of health care.

In 2008, there were 231 avoidable deaths per 100 000 people in Estonia (standardized for EU standard population). Again, there is a large gap in avoidable mortality between men and women: the rate for men (356 per 100 000) is more than twice that for women (143 per 100 000). Avoidable mortality has been reduced by 20–30% since 2000. Fig. 9 shows (similar to other countries) that the rate of avoidable mortality has declined more sharply than overall mortality for both sexes, and avoidable mortality among women has declined dramatically. In 2000, avoidable deaths constituted 26% of total mortality; in 2008 it was 24%. The main causes of avoidable mortality in Estonia are cardiovascular diseases such as ischemic heart disease, stroke and hypertension, followed by cancer such as colorectal and breast cancer.

There are different methods for measuring how eliminating avoidable deaths would affect population health. One way is to look at the effect on life expectancy. If all avoidable deaths had been prevented in 2008, life expectancy at birth would have been 78.3 years, four years greater than the observed life expectancy. Further, since two-thirds of the avoidable deaths occur among men, the sex gap in life expectancy would also be reduced: male and female life expectancy would increase by 4.8 years and 2.1 years, respectively.

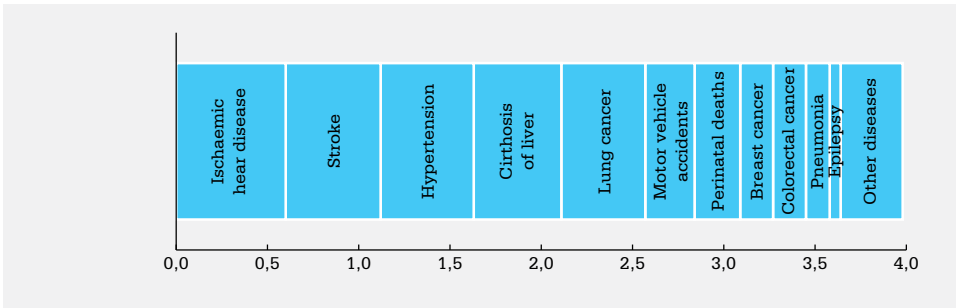
Fig. 10 shows the main diseases comprising the estimated four-year increase in life expectancy. Eliminating avoidable deaths from ischemic heart disease, stroke, hypertension, cirrhosis of the liver and lung cancer would each add more than 0.5 years to life expectancy (slightly more than 2.5 years total). However, as the methodology used does not cover all injuries that are important in Estonia, the life expectancy gain from injury prevention is currently an underestimate.

**Fig. 9. All-cause and avoidable mortality, by sex, 2000–2008**



Source: calculated using: Deaths by cause of death, sex and age group [online database] (36).

**Fig. 10. Estimated potential gains in life expectancy (years) from eliminating avoidable mortality, 2008**



Note: the total gain is 3.98 years (for males and females combined).

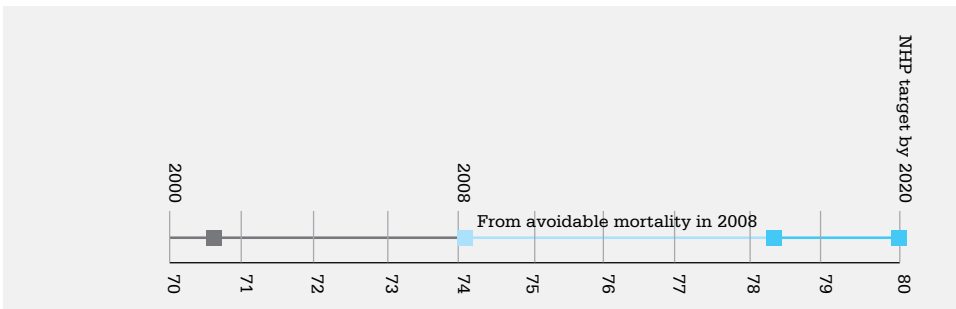
Source: calculated using: Deaths by cause of death, sex and age group [online database] (36).

Fig. 11 below shows how adding the potential gains from eliminating avoidable mortality together with the realized gains in life expectancy since 2008 would bring Estonia close to achieving the life expectancy target of the National Health Plan of 80 years by 2020.

### 3.1.5. Burden of disease

The burden of disease is measured using disability-adjusted life-years (DALYs). This measure combines years of life lost due to premature mortality<sup>4</sup> and years of life lost due to time lived in states of less than full health. One DALY can be thought of as one lost year of life in full health. The sum of DALYs across the population, or the burden of disease, can be thought of as measuring the gap between current health status and an ideal health status in which the entire population lives to an advanced age free of disease and disability.

**Fig. 11. Summary of gains in life expectancy from 2000 to 2008, estimated potential gain and target for life expectancy for 2020.**



Note: NHP – National Health Plan 2009–2020.

Sources: calculated using: National Health Plan 2009–2020 (4) and Deaths by cause of death, sex and age group [online database] (36).

The burden of disease in Estonia is estimated to be 474 521 DALYs lost in 2006: 353 DALYs per 1000 population. This means that each year each individual in Estonia loses about a third of a year of high-quality life on average. More than half of these lost DALYs are due to premature mortality, and this share is even greater among men. However, the overall levels of burden of disease do not differ significantly between sexes. Furthermore, almost 60% of the total DALYs lost stem from people of working age (16–64 years old) (46). This tendency is more pronounced for men due to the much higher rates of mortality from cardiovascular diseases and injury (external causes) in this age group and their shorter life expectancy in general.

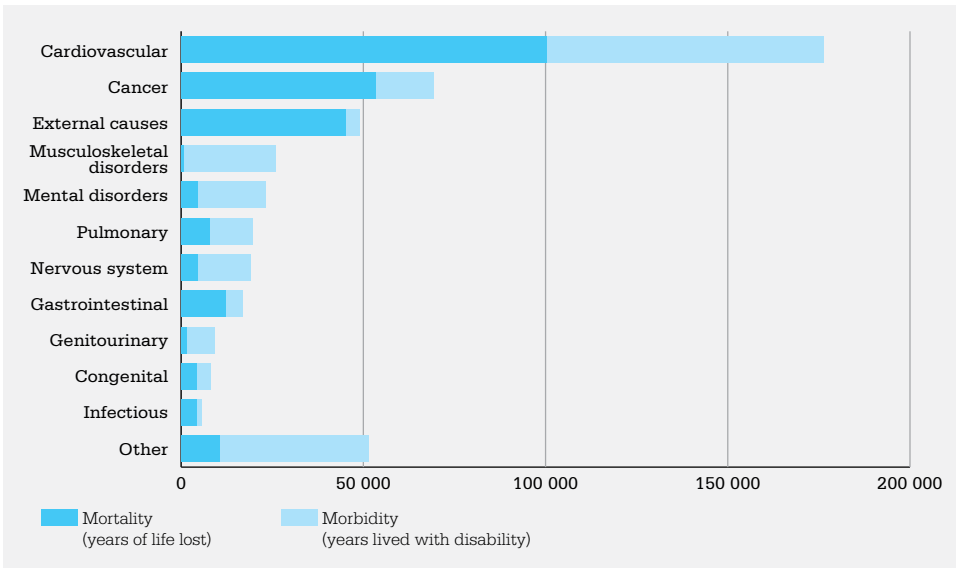
The main causes of the burden of disease overall are cardiovascular diseases, cancer and external causes such as injuries and suicide (Fig. 12). The main types of cancer

<sup>4</sup> Defined as death prior to life expectancy of gender-age group specific to Estonia

contributing to the burden of disease are colorectal, lung and breast cancer. Behavioural health risks and the burden of disease are strongly linked. According to 2004 data, smoking, hazardous levels of alcohol consumption and lack of physical activity each accounted for 6–10% of the total burden of disease (47).

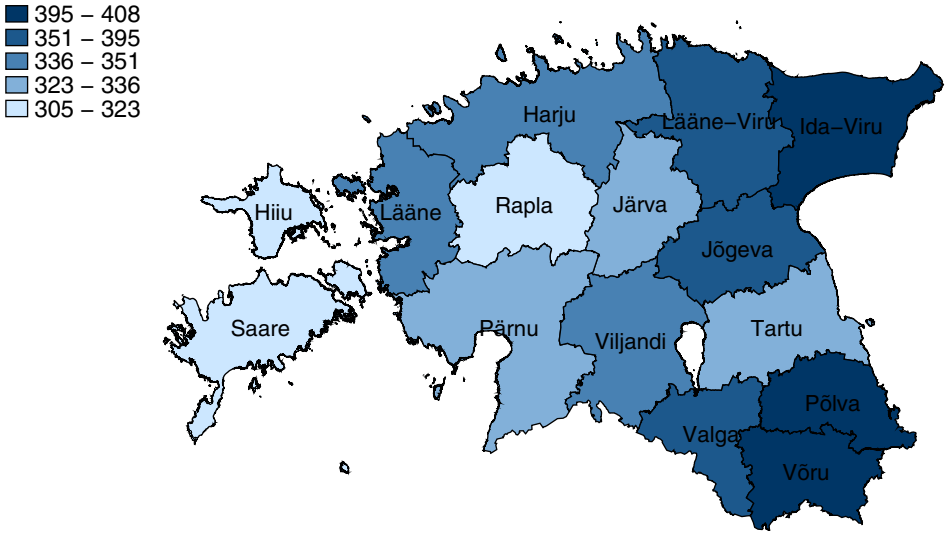
As shown in Fig. 13, the rate of burden of disease varies significantly by region. The average annual loss of high-quality life ranges from about 305 to 408 DALYs per 1 000 population between counties and from 176 to 761 DALYs per 1 000 population between municipalities. The central and western counties had lower levels of burden of disease, whereas the south-east, island and north-east counties had the highest. The Ida-Viru county had the worst level of burden of disease and its difference from the second worst county was considerable. As expected, counties with higher employment rates, greater numbers of working hours, higher hourly wages and a lower proportion of households under the poverty line generally have a lower burden of disease rates per 1 000 population. Reducing inequity in health requires allocating more resources to the areas with greater need while all policies need to explicitly address their possible impact on regional health inequities. Regional health inequities are an important issue that can challenge social cohesion if not addressed through economic, social and health policies.

**Fig. 12. Burden of disease (total DALYs lost), by disease group, broken down by years of life lost due to mortality and years of healthy life lost to disability**



Source: Lai & Kohler (46).

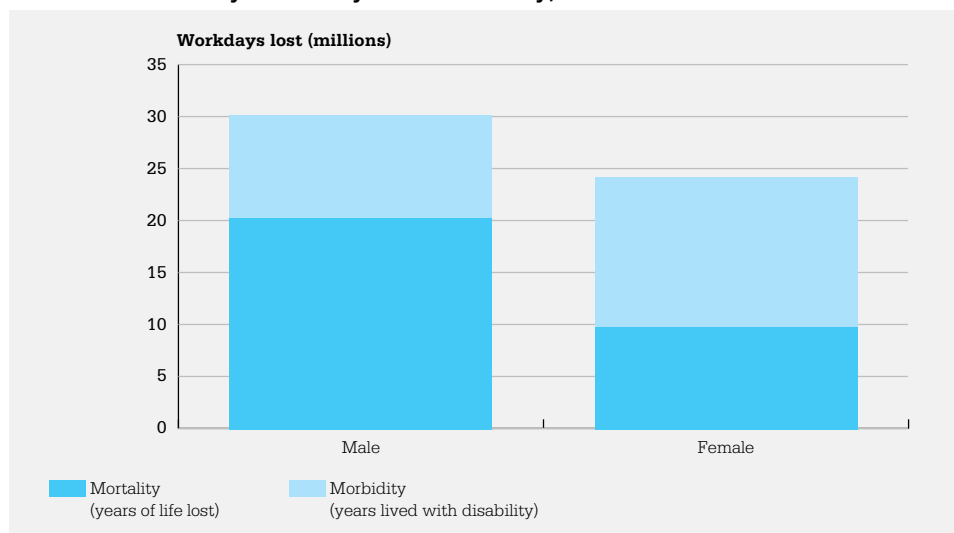
**Fig. 13. Burden of disease (DALYs per 1000 population) quintiles in Estonian counties, 2006**



Source: Lai & Kohler (46).

Fig. 14 shows an estimate of the impact of the burden of disease on the population of working age (16–64 years old). High rates of productive individuals and the work-days associated with them lost to premature mortality and morbidity affect national economic growth and productivity. It would be useful to track these rates over time and express them as a percentage of the total labour force to determine whether improvements in health status help to contribute to economic growth.

**Fig. 14** Estimated effect of the burden of disease on the population of working age (16–64 years old) in terms of lost workdays, by sex and by mortality and morbidity, 2006



Source: calculations based on Lai & Kohler (46).

## 3.2. Health behaviour and health promotion

The previous section has shown how population health has improved since 1995. Nevertheless, further improvement requires reducing the incidence of noncommunicable diseases, avoidable mortality and the burden of disease by promoting healthier behaviours in Estonia. We report on performance, using as proxies for health promotion and healthy behaviour indicators of: immunization with DPT3 (diphtheria, tetanus, pertussis); tobacco and alcohol consumption; overweight and obesity rates; and physical activity.

### 3.2.1. Immunization rates

The ideal immunization rate for two-year-old children is 100%. The rate for Estonia has improved substantially, from 70% in 1990 to 95% in 2008, and is slightly greater than the EU average for all three diseases<sup>5</sup> (Fig. 15 below). However, Latvia and Lithu-

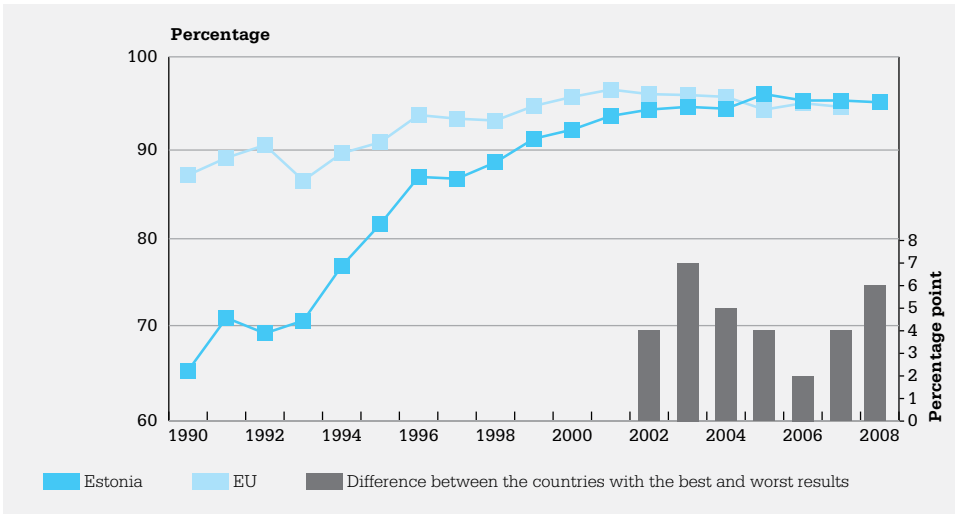
<sup>5</sup> The Health Protection Inspectorate has validated the immunization data, and the quality is sufficient to compare with the results from other European countries

ania still report better results (45), and variation in rates across Estonia’s counties has increased in the recent years. Because of the benefits of herd immunity, the focus ought to be on improving results in the counties still lagging behind and ensuring that current high performance in other counties is sustained.

### 3.2.2. Tobacco and alcohol consumption

Tobacco consumption is measured as the percentage of the population that smokes on a daily basis. Alcohol consumption is measured as the average annual consumption of litres of pure alcohol per person. The percentage of the population aged 15 years and older who are regular daily smokers increased sharply between 1990 and 1994 (from about 28% to 36%). From 1994 to 2004, this fell to the same percentage as in 1990 but increased to 30% in 2006. This is higher than the EU average of 27%. In Estonia, similar to many other European countries outside western Europe, smoking is much more prevalent among men: in 2006, 40% of men aged 15 years and older were regular daily smokers. It is also noteworthy that the proportion of non-smokers has increased faster for females. This is caused by both higher rate of quitting and a lower smoking incidence.

**Fig. 15. Percentage coverage of DPT3 immunization for two-year-old children, Estonia and EU, 1990–2008 and the differences between Estonia’s counties with the best and worst results, 2002–2008**



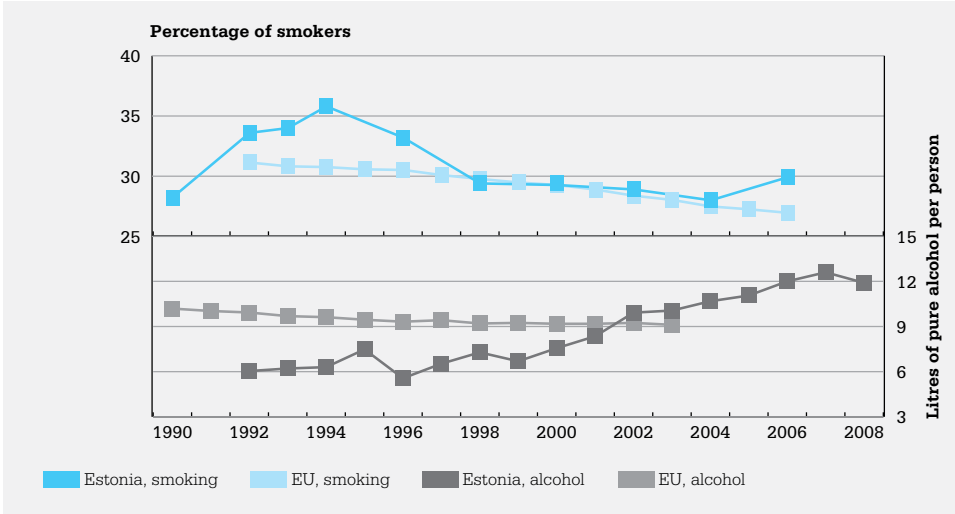
Sources: European Health for All database (45) and Riiklik immuniseerimiskava ja selle täitmine [National immunization plan and its results] [web site] (48).



Data are available on the average consumption of alcohol per person since 1992, showing no increase until 1996 and then increasing steadily from about 6 litres per person to 12 litres of pure alcohol per person and per year in 2008. The EU average declined slowly but steadily after 1990 to about 9 litres per person in 2003 (Fig. 16).

The previous section described the effects of heavy smoking rates (especially among men) and consumption of alcohol in Estonia – avoidable mortality from liver cirrhosis and lung cancer and the sex gap in life expectancy and disability-free life expectancy. Achieving the national health plan targets for life expectancy and disability-free life expectancy requires implementing effective policies to reduce smoking (especially among men) and alcohol consumption.

**Fig. 16. Percentage of Estonia's population aged 15+ years or older who are regular daily smokers and average annual consumption of alcohol (litres of pure alcohol per person), Estonia and EU, 1990–2008 (as available)**



Sources: European Health for All database (45), Alcohol market, consumption and harms in Estonia, year-book 2008 (49), Eesti alkoholiturg 2007 aastal [Estonian alcohol market 2007] (50) and Eesti alkoholiturg 2008 aastal [Estonian alcohol market 2008] (51).

### 3.2.3. Overweight, obesity and physical activity

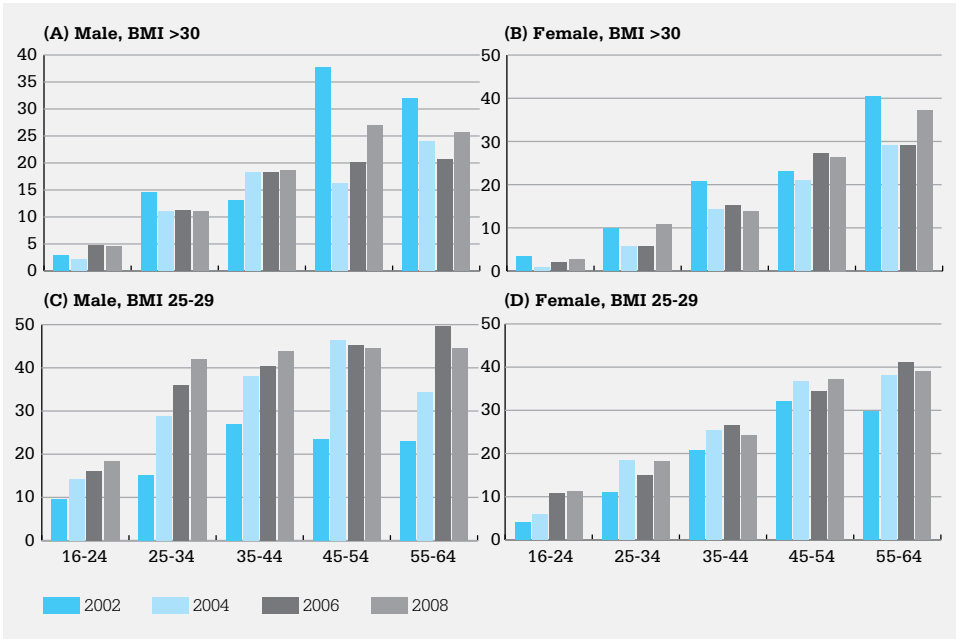
An overweight individual has a body mass index (BMI) greater than or equal to 25 and an obese individual has a BMI greater than or equal to 30. The overall obesity

rate in the adult population in 2006 was 18%. The National Health Plan targets are to reduce this to 13% by 2012 and 12% by 2020.

Fig. 17 shows that the rates of Estonians who are obese and overweight have increased year by year for both males and females and for all age groups since 2004 (the statistics for the first year, 2002, appear to be unreliable for rates of obesity for men older than 45 years and women older than 55 years). In 2008, more than 10% of men and women aged 25–44 years were obese and more than 50% were either obese or overweight; for men and women aged older than 45 years, more than 25% were obese and more than 60% were either obese or overweight; and for women aged older than 55 years, more than 35% were obese and more than 75% were either obese or overweight. Fig. 17 also shows that there has been a clear trend from having a normal weight to being overweight while changes in the obese category have not been as clear. However, if poor dietary habits and the lack of physical activity continue along the same trends, the increase in overweight will be followed by an increase in obesity with its added effect on population health.

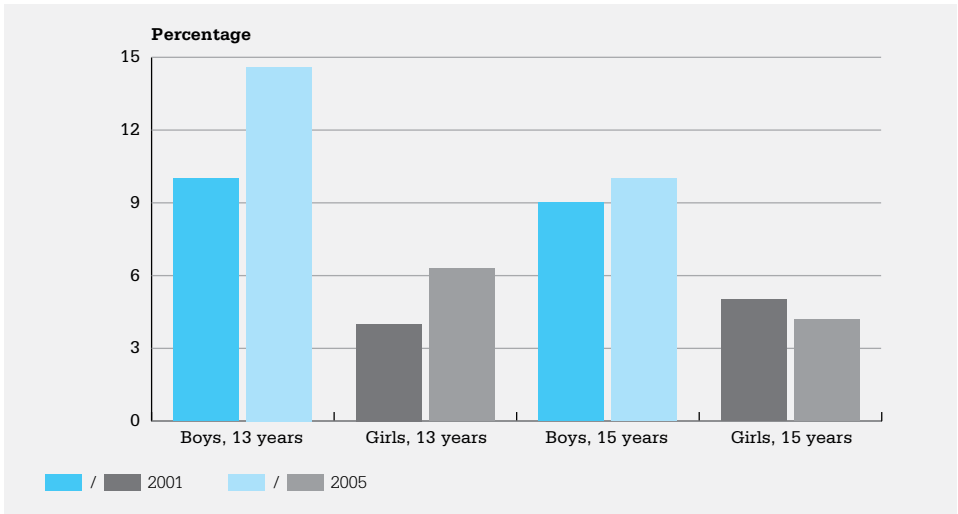
In addition, Fig. 18 gives rates of overweight among Estonians aged 13 and 15 years in 2001 and 2005, showing an alarming increase among 13-year old boys from 10% to nearly 15% (about one percentage point per year) which again underlines the threat of obesity increase in the Estonian population in the near future.

**Fig. 17** Percentage of the population considered overweight and obese, by sex and age group, 2002–2008



Sources: Kasmel et al. (40) and Tekkel et al. (41–43).

**Fig. 18. Percentage of 13- and 15-year-olds considered overweight, by sex, 2001 and 2005**

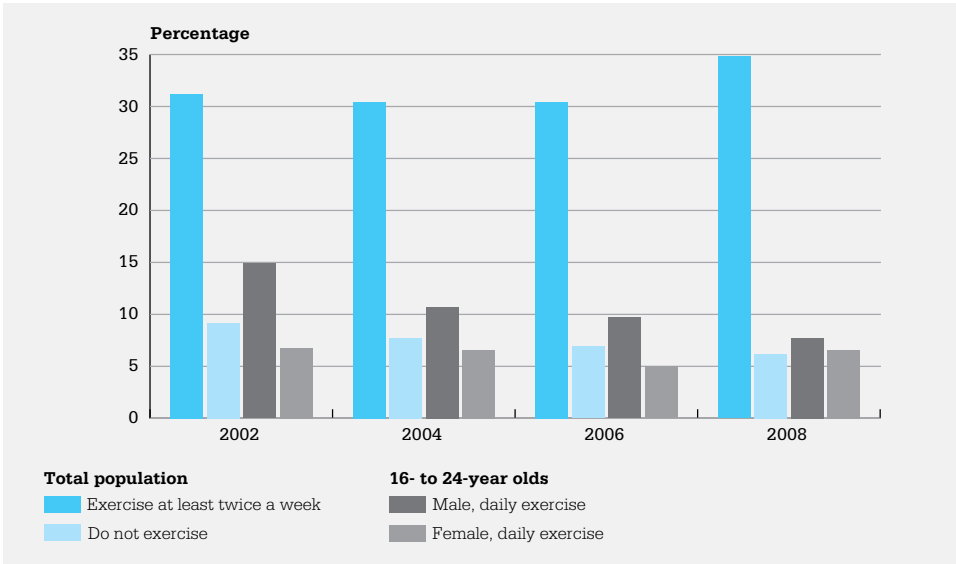


Sources: Maser (52) and Aasvee (53).

These trends suggest that the overall obesity rate in the adult population in 2012 will be above the target of the National Health Plan of 13% and that these high rates will only decline if individuals decide to dramatically change their diet, reduce alcohol consumption and exercise more.

WHO recommends that everyone engage in at least 30 minutes of moderate physical activity every day (54). Fig. 1 shows the percentage of Estonians who report physical exercise. The percentage of the population saying that they exercised for at least 30 minutes at least twice per week increased from about 30% between 2002 and 2006 to 35% in 2008. The percentage indicating they did not exercise at all decreased from about 8% to 6% between 2002 and 2008. Fig. 1 also shows a disturbingly sharp decline in the percentage of 16 to 24 year-old men who exercise daily: from 15% in 2002 to less than 10% in 2008. Unless this changes, rates of obesity in the adult population are likely to continue to increase.

**Fig. 19. Percentage of the population reporting selected frequencies of physical activity at leisure and for 16–24-year-olds by sex, 2002–2008**



Sources: Kasmel et al. (40) and Tekkel et al. (41–43).

### 3.3. Broader determinants of health

The WHO Commission on Social Determinants of Health (24) found that “the poor health of the people, the social gradient in health, and the marked health inequities between countries are caused by the unequal distribution of power, income, goods, and services, globally and nationally, the consequent unfairness in the immediate, visible circumstances of people’s lives – their access to health care, schools, and education, their conditions of work and leisure, their homes, communities, towns, or cities – and their chances to lead a flourishing life”. The determinants of health related to living and working conditions are the following: agriculture and food production, education, work environment, unemployment, water and sanitation, health care services, and housing (24). This section of the report examines performance in Estonia against a number of these determinants: education, employment, clean drinking-water, good air quality, safe transport and good working conditions.

### 3.3.1. Level of education

Higher education is also associated with higher income levels, which is a determinant of better health (24). Estonians' number of years in education has increased substantially since 1998 and is now about 0.5 years greater than the average for the EU countries. Fig. 20 shows the expected numbers of years in education<sup>6</sup> for males and females 6–25 years old. The number of years in education has been high and stable since 2000, with females having about one year more than males. Since 2005, there has, however, been a small decline (similar to the EU average) that has been more pronounced for females.

**Fig. 20. Expected number of years of education for Estonia's total population and the EU and for Estonians 6–25 years old by sex, 1998–2008 (as available).**



Sources: School-life expectancy by sex and age group [online database] (55) and School expectancy [online database] (56).

<sup>6</sup> The expected number of years in education (school expectancy) is calculated by adding the single-year enrolment rates for all ages and is essentially a measure of the current patterns of enrolment. The estimates are based on head count data. For example, if 75% of 20-year-olds were enrolled in school, this would count for three quarters of a year of school expectancy.

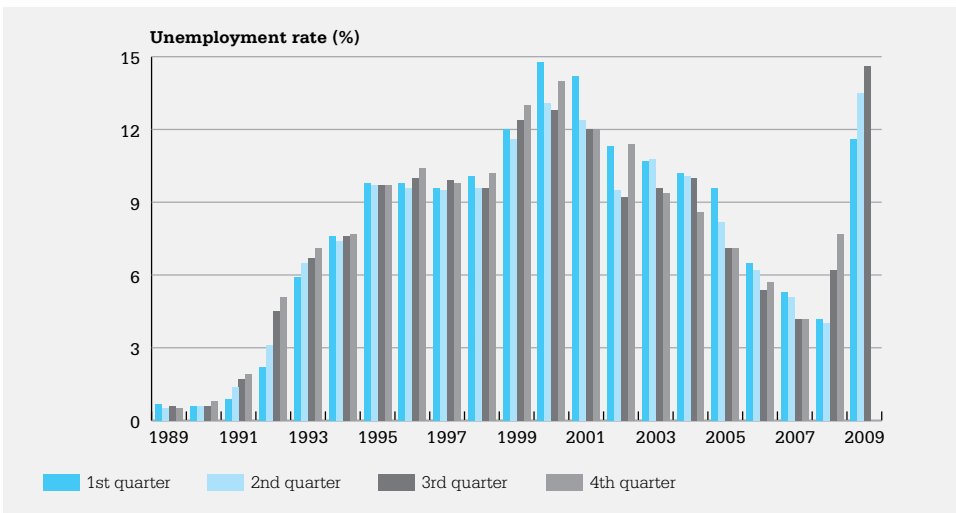
### 3.3.2. Unemployment

A recent study (57) showed that increasing unemployment is associated with higher rates of suicide, homicide and deaths from alcohol abuse among those younger than 65 years. Another report (24) also links poorer health status with precarious work status (informal, temporary and contract work). During the transition after its independence from the USSR, Estonia experienced sudden increases in unemployment, which peaked in 2000 (reaching nearly 15%). After the year 2000, unemployment declined as dramatically as it had risen and fell to 4% in 2007. However, the global economic downturn has caused serious economic difficulties for many countries, including the Baltic countries. The unemployment rate has increased even more sharply than in the transition and exceeded 15% in the third quarter of 2009 (Fig. 21).

### 3.3.3. Clean drinking-water

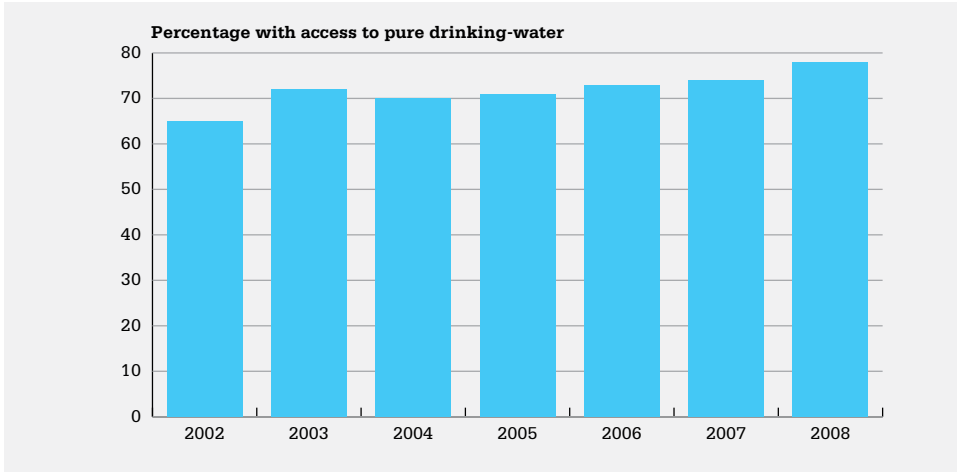
Clean drinking-water is also an important determinant of health. Fig. 22 shows that of those who have piped water, the percentage who have pure drinking-water in Estonia increased from 65% in 2002 to 78% in 2008. However, only about 80% of the population has access to piped water; the quality of drinking-water available to the other 20% of the population is not known.

**Fig. 21. Quarterly unemployment rate, 1989–2009**



Source: Unemployed persons by duration of unemployment (quarters) [online database] (58).

**Fig. 22. Percentage of Estonia's population with piped water that has pure drinking-water, 2002–2008**



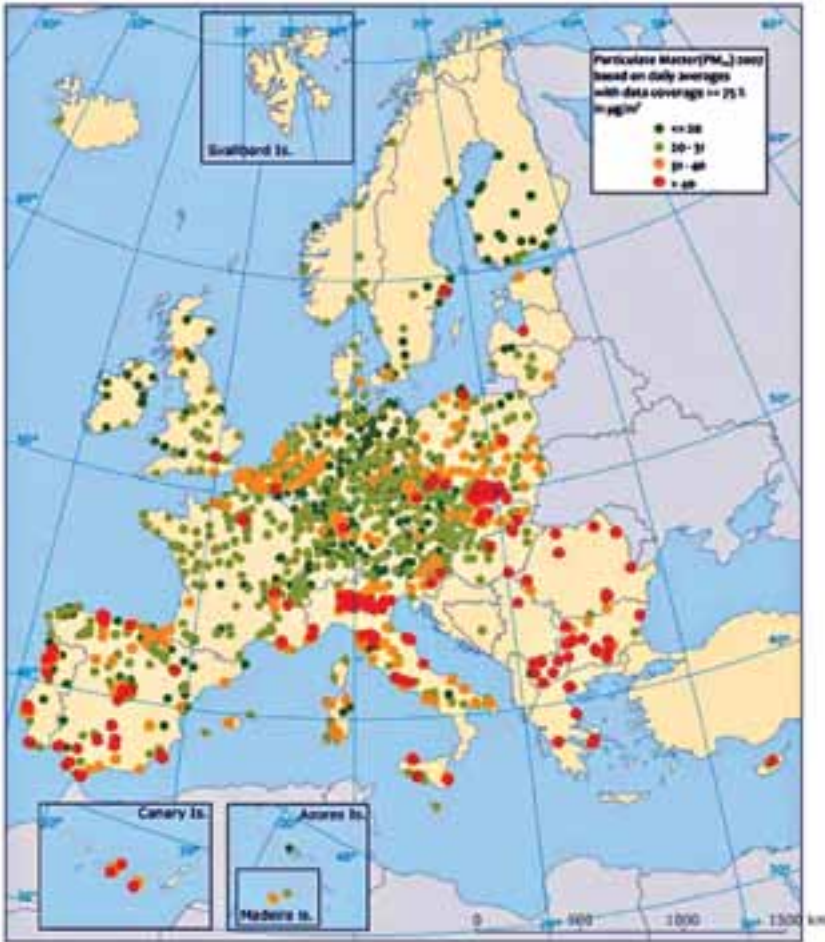
Source: Birk (59).

### 3.3.4. Air quality (concentration of particulate matter)

An indicator of air pollution is the concentration of particulate matter (PM10) in outdoor air. Fig. 23 shows that the air in Tallinn is as polluted as in many sites all over Europe. However in the countryside the air is relatively clean. This indicates the importance of local pollution in cities, whereas in the countryside the transboundary pollution dominates. The recent analysis has shown significant health effects in major cities due to particulate matter (60). However, in the last eight years, the concentrations of PM10 in Tallinn have stayed at the same level or slightly increased. Even if the annual average values did not exceed the limit value, the daily peak values exceeded daily limit values for 63 days a year while the tolerated number of days exceeding daily limits is 35 (61).



**Fig. 23: Annual mean concentration of particulate matter in air quality measuring stations in Europe in 2007**



Source: Mol et al. (62).

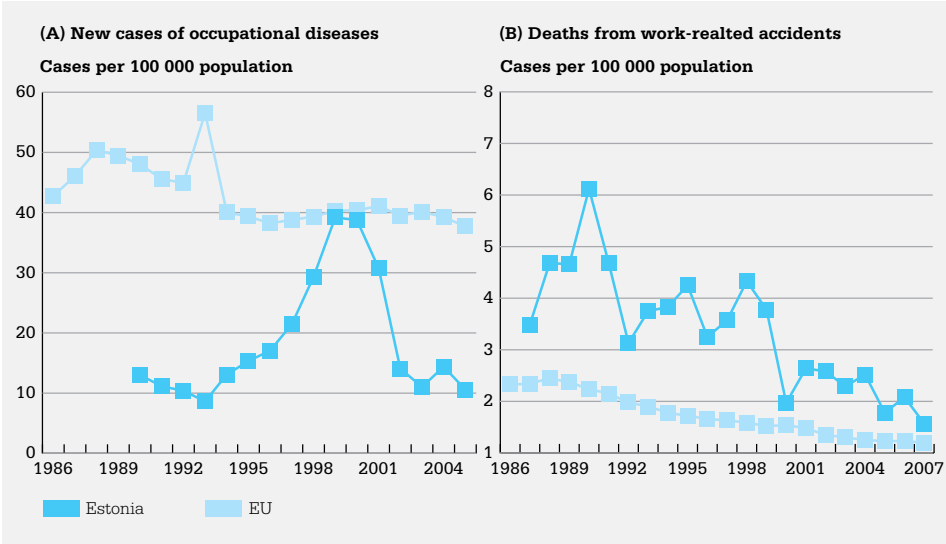
### 3.3.5. Occupational health

Poor working conditions affect health and can result, for example, in increased risks of chronic long-term conditions as well as sudden injuries. Stress at work can also be associated with increased risk of heart disease.

Fig. 24 shows the incidence rates (new cases) of work-related diseases and the deaths resulting from work-related accidents. Deaths from work-related accidents peaked

in 1989 around the time of independence and then fell sharply with great fluctuation during the transition, and have since declined to a level closer to the EU average. The reported rates of occupational diseases increased from about 10 per 100 000 in 1992 to nearly 40 in 1998 and 1999 (close to the EU average) but then fell back to about 10 again since 2001 (with the EU average remaining at about 40). Since the latest results are only one-quarter of the EU average, we believe that there is a considerable level of the incidence of occupational diseases which remains unreported.

**Fig. 24. Incidence of occupational diseases and deaths from work-related accidents per 100 000 population, Estonia and the EU, 1985–2008**



Source: European Health for All database (45).

### 3.4. Responsiveness of the health system

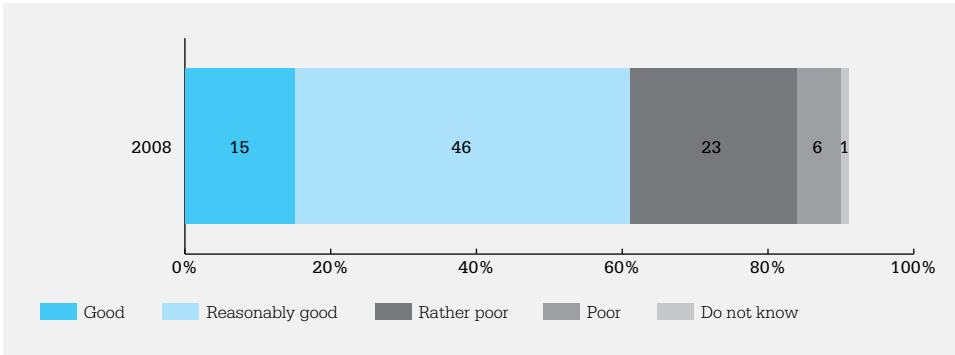
Measures of the responsiveness of the health system aim to capture how well the health system responds to the expectations and demands of the population. WHO identifies two aspects of responsiveness: respect for people (dignity, confidentiality and autonomy to participate in choices about one’s own health); and client orientation (prompt attention, amenities of adequate quality, access to social support and choice of provider) (1). The different dimensions of health system responsiveness defined by the World Health Organization (1) could not all be covered by the data available, therefore this section presents only results on patients’ overall satisfaction with the

health care, with access to health care services and with the quality of health care services delivered (for those who accessed those services). It should be a priority to develop and routinely collect performance indicators covering the different dimensions of health system responsiveness.

Specific measures presented below include satisfaction: with the health care in general; with the benefit package; with access to health care services; with primary health care services; with hospital care during the last visit; and with the quality of health care services in general.

Satisfaction with the health care has improved over time, but there is still room for improvement compared to other countries. In a survey question on satisfaction with the health care in Estonia in 2008, out of 99% of those surveyed who provided ratings of their satisfaction with the health care, nearly 60% rated it as “good” or “reasonably good” (Fig. 25). The target of the National Health Plan 2009–2020 is to increase this to 72% (or more) by 2020.

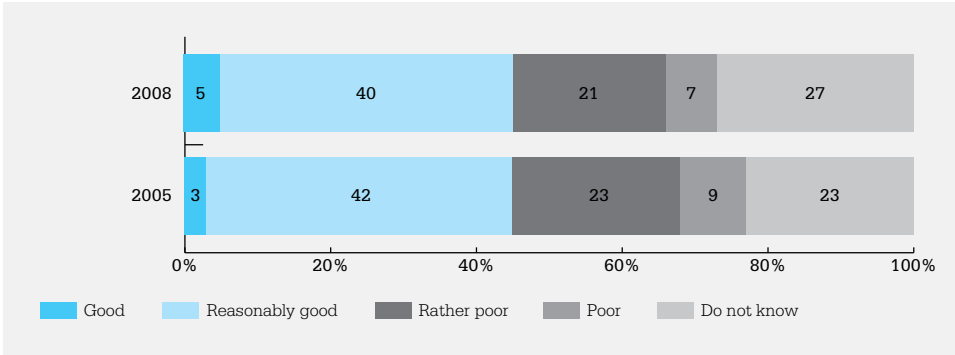
**Fig. 25. Ratings of the health care by a population survey sample, 2008**



Source: *Elanike hinnangud tervisele ja arstiabile, 2005 [Population satisfaction with health and health care, 2005] (63).*

In a survey question on satisfaction with the health benefit package in Estonia in 2005 and 2008, about 75% of the surveyed population rated their level of satisfaction, and out of those less than half indicated that their satisfaction was “good” or “reasonably good” (Fig. 26).

**Fig. 26. Percentage of a population survey sample indicating satisfaction with the health benefit package, 2005 and 2008**

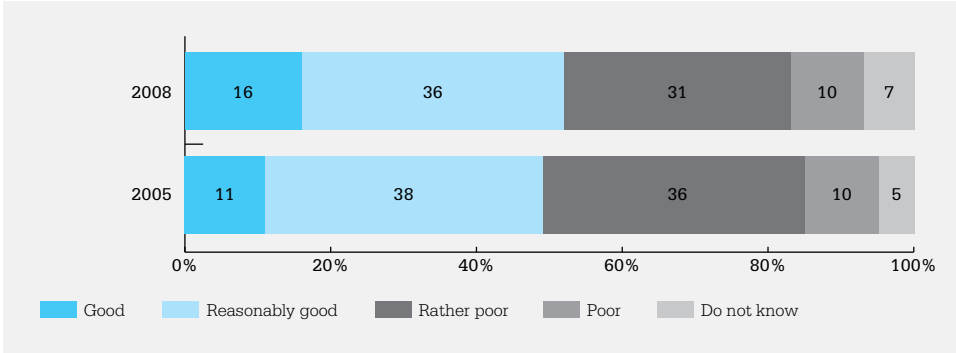


Sources: *Elanike hinnangud tervisele ja arstiabile, 2005 [Population satisfaction with health and health care, 2005] (63)* and *Elanike hinnangud tervisele ja arstiabile, 2008 [Population satisfaction with health and health care, 2008] (64)*.

About 95% of those surveyed in the 2005 and 2008 surveys on Population Satisfaction with Health and Health Care (63,64) provided a rating on satisfaction with access to health care services and out of those, only about half indicated that their satisfaction with access was “good” or “reasonably good” (Fig. 27). The rate of 52% in 2008 indicates perceived problems with access to health services and that changes will be required to achieve the target of the National Health Plan (68% by 2020).

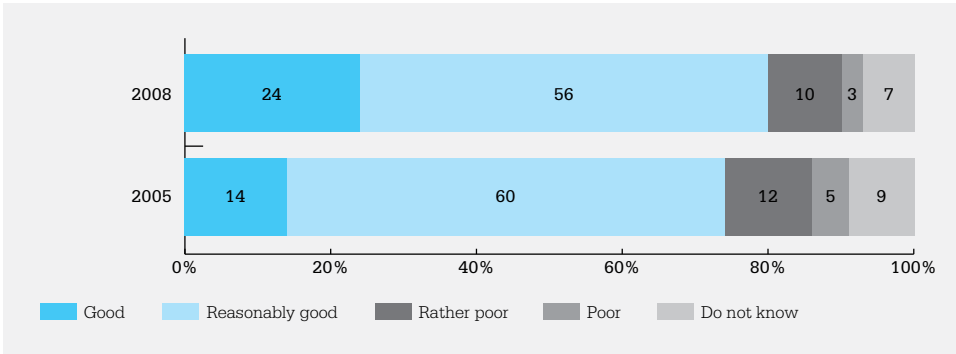
In the survey questions on satisfaction with primary health care and hospital services (for those able to access these services) in 2005 and 2008, about 90% rated their satisfaction with primary health care and 97% with hospital services. In 2008, 80% indicated that satisfaction with primary health care was “good” or “reasonably good”, an increase from 74% in 2005, while 92% of those surveyed gave the same ratings with regards to their satisfaction with hospital services, unchanged from 2005 (Fig. 28 and 29). In the United Kingdom, in contrast, surveys show much higher levels of satisfaction with primary care (about 80%) than with hospital care (about 60%) (65).

**Fig. 27. Ratings of access to health care in Estonia by a population survey sample, 2005 and 2008**



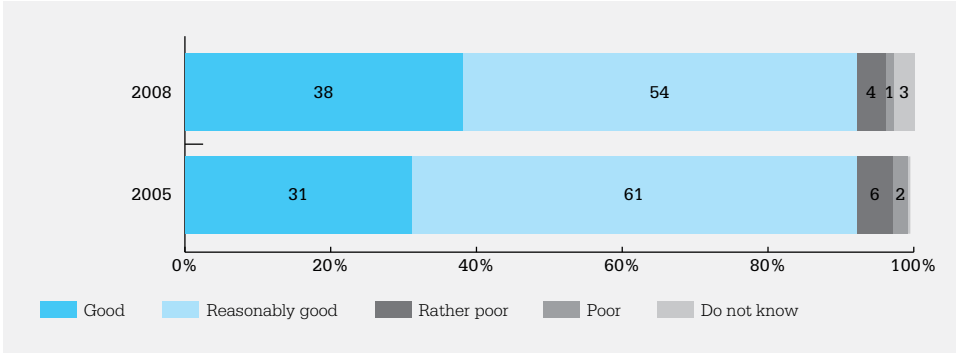
Sources: Elanike hinnangud tervisele ja arstiabile, 2005 [Population satisfaction with health and health care, 2005] (63) and Elanike hinnangud tervisele ja arstiabile, 2008 [Population satisfaction with health and health care, 2008] (64).

**Fig. 28. Ratings of satisfaction with primary health care in Estonia by a population survey sample, 2005 and 2008**



Sources: Elanike hinnangud tervisele ja arstiabile, 2005 [Population satisfaction with health and health care, 2005] (63) and Elanike hinnangud tervisele ja arstiabile, 2008 [Population satisfaction with health and health care, 2008] (64).

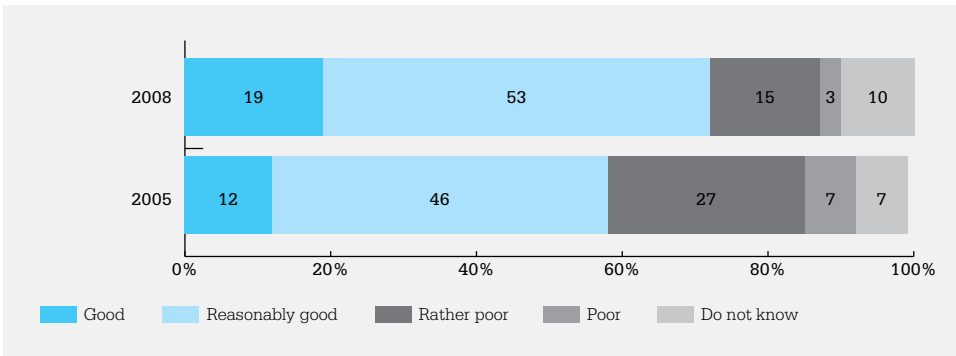
**Fig. 29. Ratings of satisfaction with hospital care during the last visit by a population survey sample, 2005 and 2008**



Sources: *Elanike hinnangud tervisele ja arstiabile, 2005 [Population satisfaction with health and health care, 2005] (63)* and *Elanike hinnangud tervisele ja arstiabile, 2008 [Population satisfaction with health and health care, 2008] (64)*.

In the survey questions on satisfaction with the quality of health care in 2005 and 2008, about 90% of those surveyed provided a rating, and the percentage indicating that their satisfaction was “good” or “rather good” increased from less than 60% in 2005 to more than 70% in 2008. The percentage indicating that their satisfaction was “rather poor” or “poor” decreased from 34% in 2005 to 18% in 2008 (Fig. 30). These improvements in the perceived quality of care in Estonia have led to 2008 results that are comparable to most other EU countries.

**Fig. 30. Ratings of the quality of health care in Estonia by a population survey sample, 2005 and 2008**



Sources: *Elanike hinnangud tervisele ja arstiabile, 2005 [Population satisfaction with health and health care, 2005] (63)* and *Elanike hinnangud tervisele ja arstiabile, 2008 [Population satisfaction with health and health care, 2008] (64)*.

However, the perceived quality of health care services does not measure the actual quality of health care services delivered. There are only a few performance indicators based on evidence on the quality and safety of services delivered by health care organizations and professionals in Estonia, as discussed later in the section related to health care services quality and safety.

### **3.5. Equitable financing, financial protection, resource allocation and coverage**

The WHO Tallinn Charter states that, although there may be no single best approach to health financing, the way a health system is financed should meet the following objectives: sustain the redistribution of resources to meet health needs; reduce financial barriers to the use of needed services; and protect against the financial risk of using care – all in a manner that is fiscally responsible (16). These objectives of health system financing bring together health system goals (protection against financial risks of ill health and fairness in financing) and instrumental objectives such as better coverage, reduced inequality in access to health services and the financial sustainability of health systems (66). This section deals with various aspects but not all aspects which could be considered under a health system financing comprehensive analysis.

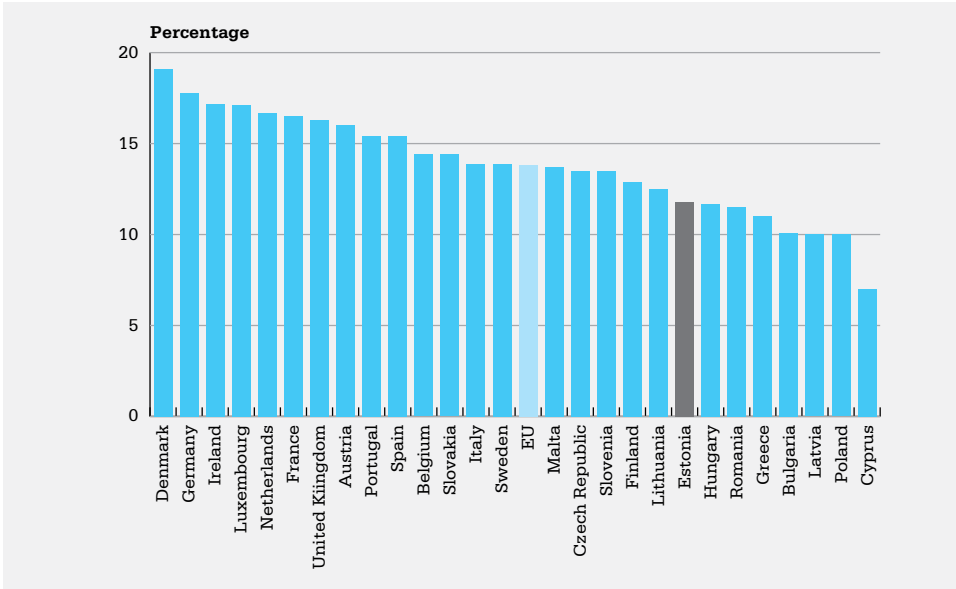
#### **3.5.1. Level of health expenditure**

Factors external to the health system impose constraints on the extent to which a country can realize the objectives, goals and values of the health system. For health system financing, the most important of these is the fiscal context (66). This refers to the ability of the government to mobilize tax and other public revenue and the need for these to be balanced with total public spending. In general, health systems that rely more on public funding tend to better achieve financial protection, equity in finance, and equity in utilization. This means that the fiscal context is critical to understanding the capacity of a government to support the health system with public resources.

A good measure of the fiscal context is the proportion of government spending devoted to health. Fig. 31 shows results for Estonia, other EU countries and the EU average: although Estonia does not have the lowest share – close to 12% of government spending is indeed allocated to health – the EU average of 14% is higher, and several countries have results greater than 15%. It should be noted that at a minimum, the current economic crisis will influence the results for this indicator for the years 2008

and 2009 due to interaction of changes in overall fiscal space, government expenditures and health financing.

**Fig. 31. Government expenditures on health as a percentage of all government expenditure: Estonia, EU countries and the EU, 2007**



Source: European Health for All database (45).

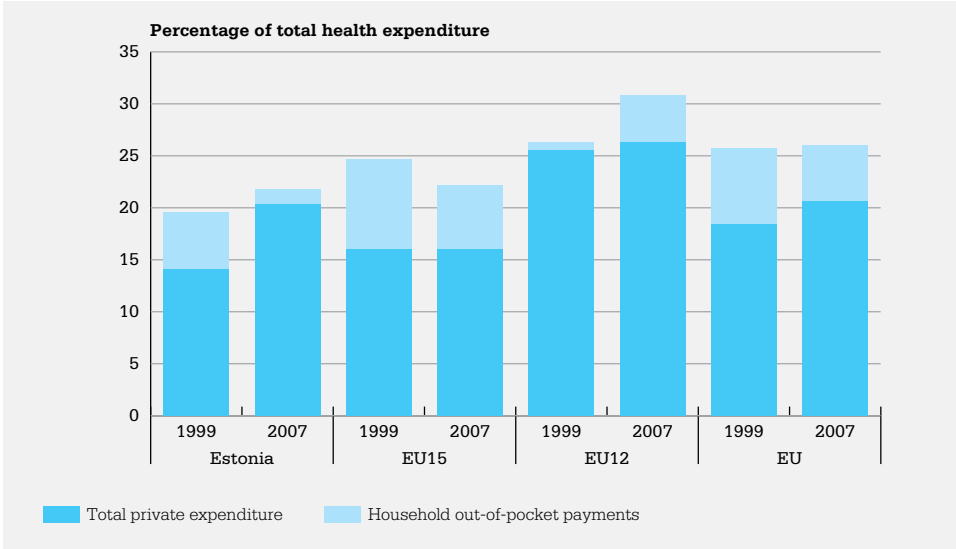
Another measure of government support for health care is the proportion of health care expenditures arising from private sources compared with public (government) sources. Fig. 32 shows private expenditures for health care as a percentage of total health care expenditures in Estonia, along with averages for all EU countries and the EU15 (the 15 countries of the EU before 2004) and EU12 (the 12 countries joining the EU since May 2004) groups for 1999 and 2007. This shows the percentage of out-of-pocket payments<sup>7</sup> increasing from less than 15% of total health expenditure in 1999 to slightly more than 20% in 2007, with little change over this period in the averages for the different sets of EU countries. In 2007, out-of-pocket spending accounted for almost all private health expenditures in Estonia.

<sup>7</sup> Out-of-pocket payments are payments for services required at the time the service is delivered. These include, for example, co-payments, payments for medications, payments for diagnostic tests, etc. They do not include private payments for insurance premiums. However, these private payments would be included in the total private health expenditure amount.



Compared with other European countries, government expenditures on health care as a percentage of Gross Domestic Product (GDP) is relatively low in Estonia (Fig. 33) and the share of health care expenditure funded privately is growing, even if it remains relatively low compared to many other European countries. The share of health spending funded through public sources shows that the government keeps health as a relative priority in terms of its public spending. However, the relatively low share of spending on health compared with GDP is a sign of the limited fiscal capacity of Estonia – it accounts for 3.1% of GDP compared to more than 6.0% for Denmark and France. Overall, the Estonian government seems to have a relatively limited fiscal capacity compared to its national income. It could be inferred that when fiscal capacity increases, the share of GDP devoted to the health system, and to public spending in particular, would be likely to grow accordingly.

**Fig. 32. Household out-of-pocket and total private expenditure on health care as percentages of total health expenditures, Estonia, EU, EU15<sup>8</sup> and EU-12<sup>9</sup>, 1999 and 2007**

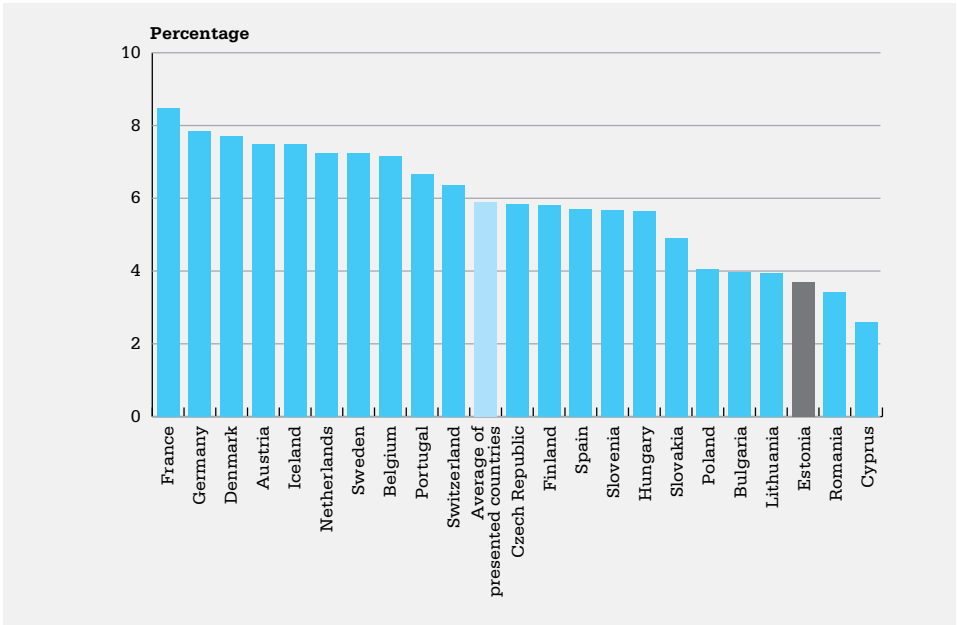


Source: European Health for All database (45).

8 EU-15 countries include: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom

9 EU-12 countries include: Bulgaria, Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia

**Fig. 33. Government expenditures on health care as a percentage of GDP, Estonia and EU countries, 2006**



Source: Health care expenditure by financing agent [online database] (67).

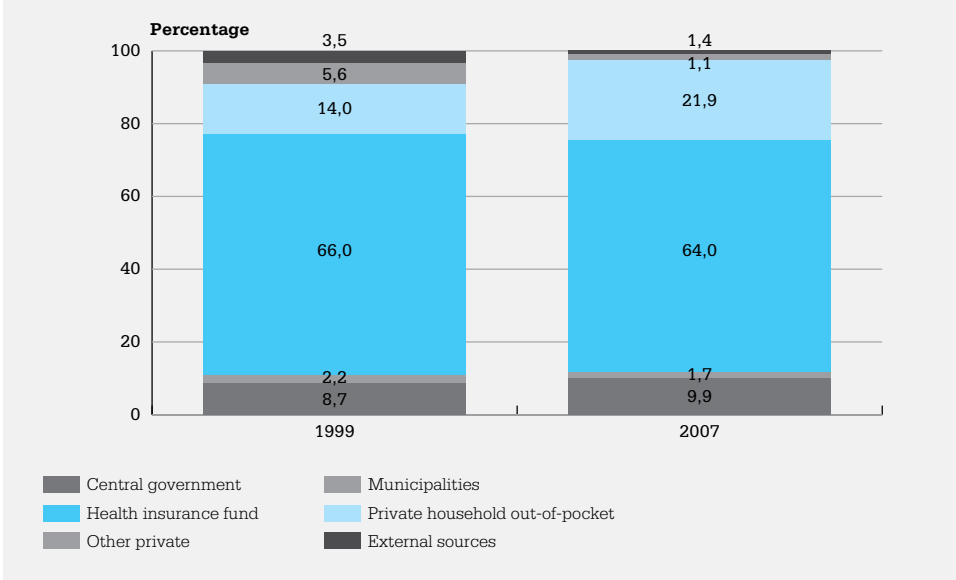
### 3.5.2. Equity in health system financing in Estonia

Another goal of health system financing is to ensure that the burden of financing is equitably distributed. This means that citizens should contribute to funding relative to their capacity to pay, with higher-income individuals contributing relatively more. The objective of equity in health system financing is closely linked to the core value of solidarity, an explicit value for the Member States of WHO (66).

The fairness of the financing of a health system can be assessed in different ways. One way to measure performance in this area is to examine coverage through insurance (in some form) and various sources of funding. International evidence suggests that systems with universal coverage that are mainly financed through compulsory prepaid sources (such as general taxation and payroll contributions for compulsory health insurance) are more equitable than those funded more by voluntary prepaid sources such as voluntary health insurance, or by out-of-pocket payments (68).

Health care in Estonia is financed by mandatory social tax contributions (health insurance fund), other government tax revenues (such as personal income tax and value-added tax) and out-of-pocket payments. The most important sources of funding are the mandatory social tax contributions and out-of-pocket payments. The mandatory social tax contributions and personal income taxation are more progressive and equitable, whereas out-of-pocket payments and value-added taxation are more regressive and inequitable. The net effect of these different funding sources is slightly progressive, meaning that households with higher gross income also pay a relatively higher proportion of health system funding. Fig. 34 shows how the relative share of these sources has changed between 1999 and 2007. Although the total share of government and health insurance fund sources has remained relatively constant, the share of out-of-pocket spending has increased.

**Fig. 34. Source of health care funding as a percentage of total health expenditure, 1999 and 2007**



Sources: National health accounts in Estonia (69).

### 3.5.3. Protection against the financial risk of ill health

Protection against the financial risk of ill health is a fundamental goal for health systems stemming from the core values of the WHO Member States: people should not become poor as a result of having to pay for the health care services they need and

should not be forced to choose between their health and their economic well-being (16). High out-of-pocket spending undermines the achievement of these goals. An analysis of data from nearly 80 countries reveals a strong correlation between the share of out-of-pocket payments in total health spending and the percentage of families facing catastrophic health expenditure exceeding 40% of their capacity to pay (70).

Fig. 35 shows that households' expenditures on health care as a percentage of total households' expenditures (and as a percentage of capacity to pay<sup>10</sup>) increased between 2000 and 2007. A study on income-related inequality in health care financing and utilization in Estonia (71) reports that about 2–4% of households had catastrophic health expenditures. Further, about 14% of households had health expenditures exceeding 20% of their capacity to pay, and the lower income quintiles had a higher proportion of households with high out-of-pocket payments compared to their capacity to pay. The north-eastern region (Ida-Virumaa) shows the largest increase in the proportion of households with high health expenditures compared to capacity to pay. Detailed analysis also shows that households containing people with poor health or disability are at higher risk of having high health expenditures. Single pensioners and pensioner couples are most often among the households with relatively high health expenditures. High out-of-pocket payments mean that having universal health insurance coverage does not seem to reduce the risk of having to make large payments for health care.

The abovementioned study (71) also reports that about 1–1.5% of all households have dropped below the poverty line due to out-of-pocket payments every year since 2001. The greatest effect is on the quintile with lowest incomes. In Ida-Virumaa, out-of-pocket payments appear to have been the greatest cause of impoverishment in 2003, 2004 and 2006. The groups who have suffered most are single pensioners and pensioner couples. In most years, the rate of falling into poverty due to payments for health care was not affected by whether people had health insurance (except for 2006, when about 12% of the households that were impoverished had two or more members without health insurance). The risk of relatively high health care expenditure is increased by low household income and by the presence of older members (65 years and older) or members with disabilities or chronic illnesses in the household.

#### 3.5.4. Resource allocation

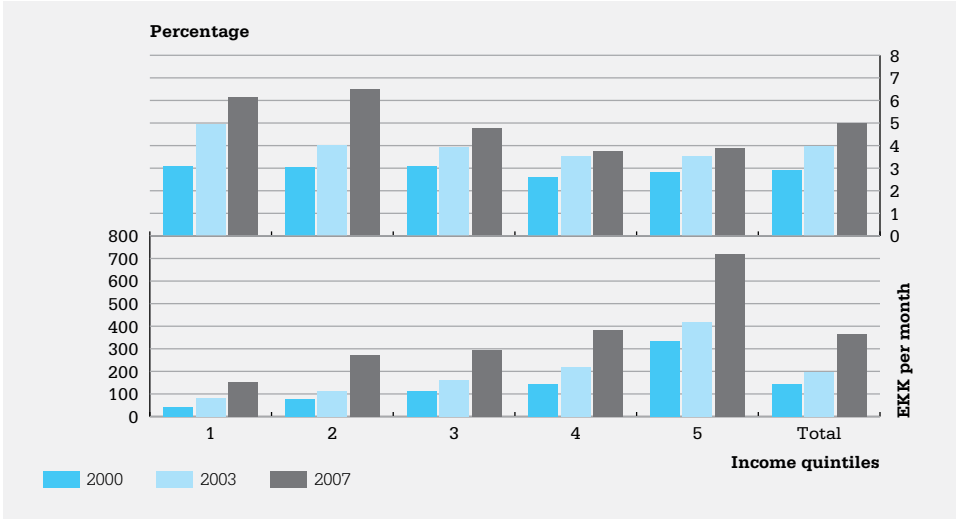
The fastest growing categories of health care expenditures are outpatient care (which includes primary health care and specialist services), long-term nursing care and

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10 Capacity to pay is defined as the permanent above subsistence income of the household

rehabilitation (Fig. 36). This finding is especially important in the context of overall health care reforms in last decades. It signifies that the reforms that turned Estonian health care from hospital centeredness towards more integrated and primary health care centred health care have been carried out both through infrastructure and financing fronts.

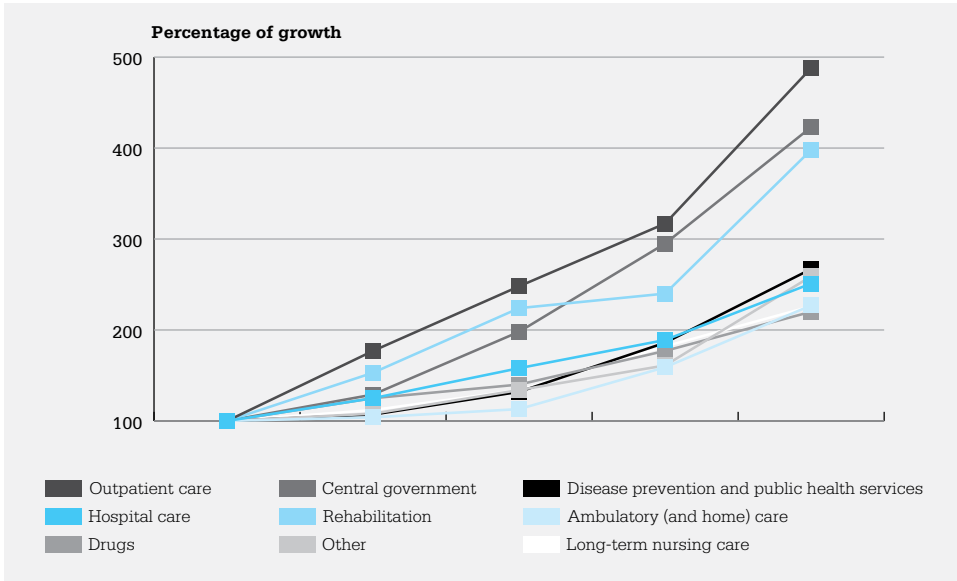
**Fig. 35. Total household out-of-pocket payments (EEK per month) and as a percentage of total household expenditure, by income quintile, 2000, 2003 and 2007**



Sources: Expenditure per household member in a month by expenditure decile of the household [online database] (72).

The changes in resource allocation also reflect the needs brought on by population processes in Estonia. In the situation of population ageing a focus on long-term nursing care and rehabilitation are likely to become a priority as people older than 65 years or with disabilities and chronic illnesses will have growing need for these services. However, if growth in expenditures in these categories continues, it is important to keep equitable financing in focus, keeping in mind that these services can place more economic stress especially on households with older members or members with chronic conditions.

**Fig. 36. Percentage growth in categories of health care expenditure, 2003–2007**



Note: Outpatient care includes both primary health care and outpatient specialist care services

Source: *National health accounts in Estonia* (69).

### 3.5.5. Health service coverage

At the end of 2006, 95% of Estonia's population (almost 1.28 million people) was covered by health insurance offered by the Estonian Health Insurance Fund (15). Entitlement to coverage is based on residence in Estonia, and the law defines benefit entitlement rules for specific groups (15). Estonia has still not reached the WHO objective of universal coverage (24,73) and there are still gaps, with over 50 000 residents having no coverage for most health care services (although access to emergency care is still available). It should be pointed out that in the context of the current economic downturn, the government of Estonia decided in 2009 that the unemployed seeking jobs and who are registered as unemployed would be covered by the health insurance fund.

## 3.6. Effectiveness and efficiency of the health system

Efficiency relates to costs and benefits in general and, for the health system, relates to health system expenditures and end goals. Exceeding goals for the same level of

expenditure or achieving the goals at lower levels of expenditure means that a health system has become more efficient. Both health system expenditures and outcomes must be assessed to determine the overall efficiency of the health system. Although indicators for individual health system goals are available, obtaining a system-wide measure of the degree to which the health system end goals are achieved is challenging. Linking the changes in the achievement of health system goals with the resources spent to further them is even more challenging. However, these are important considerations for policy-makers when investing in health system strengthening.

This section assesses the technical and allocative efficiency of the Estonian health system. Technical efficiency focuses on how available resources (inputs) are used to produce health services (outputs): for example, how well a hospital uses its available resources to provide services such as surgery and other treatments. The technical efficiency of a health system is typically assumed to be improving if its hospitals can, for example, treat the same number of cases with less capacity (fewer beds), a shorter length of stay and higher bed occupancy rates. Allocative efficiency focuses on whether resources are allocated optimally between different health care sectors or whether, for example, reallocating resources from one level of care to another would better meet health system goals. Atun argues that a health system that prioritizes primary care is more responsive to people's expectations, delivers better results and is more cost-effective (74).

### 3.6.1. Technical efficiency

Proxy indicators that can be used to assess the technical efficiency of Estonia's health system are the number of hospital beds per 100 000 inhabitants, the average length of stay in hospitals and the bed occupancy rate.

Estonia undertook a concerted programme in the 1990s to restructure its hospital sector in order to eliminate inefficiencies associated with excess hospital capacity (compared to needs). This effort led to a major reduction in the number of hospital beds per 100 000 population, in accordance with similar trends in other EU countries (Fig. 37). Planning efforts together with new contracting and payment mechanisms implemented by the Estonian Health Insurance Fund contributed to increased overall efficiency and the successful restructuring of health care in the three largest urban centres in Estonia in the late 1990s, suggesting that the reform has been successful in improving the efficiency of the health system (75). Further, a new hospital network is now in place and has contributed to significant decreases in the average length of hospital stay.

The average length of hospital stay (Fig. 38) decreased steadily through the 1990s and is now below the EU average. The bed occupancy rate in Estonia (Fig. 39) has varied considerably during this period. It fell steadily from the mid-1980s until 2001 before increasing as a consequence of the restructuring and consolidation of hospital capacity. However, the rate is still below 70%, far from the target of 83% and from the EU average of 77%. This would indicate potential for further improving efficiency through increased bed occupancy; however, occupancy rates exceeding 85% can be counterproductive (Bagust et al. (76) argued against rates above 85%). Bed occupancy rates also vary considerably between urban and rural hospitals, suggesting that hospitalization patterns should be analysed further to determine appropriate means of increasing efficiency without compromising access to health services in rural areas. Achieving optimal occupancy rates is much more difficult in small hospitals, and their scale creates difficulty in managing fluctuation in demand. Small hospitals in remote rural areas must have the capacity to provide basic services to their community, with high-cost specialized care being delivered in the large hospitals in towns.

One issue for Estonia is that, although hospital capacity in terms of number of beds, nurses and other ancillary staff working in hospitals has been reduced, the number of hospital physicians has not declined correspondingly. The number of physicians per 100 hospital beds has in fact increased over the last years (Fig. 40), possibly indicating technical inefficiency of hospital physician services.

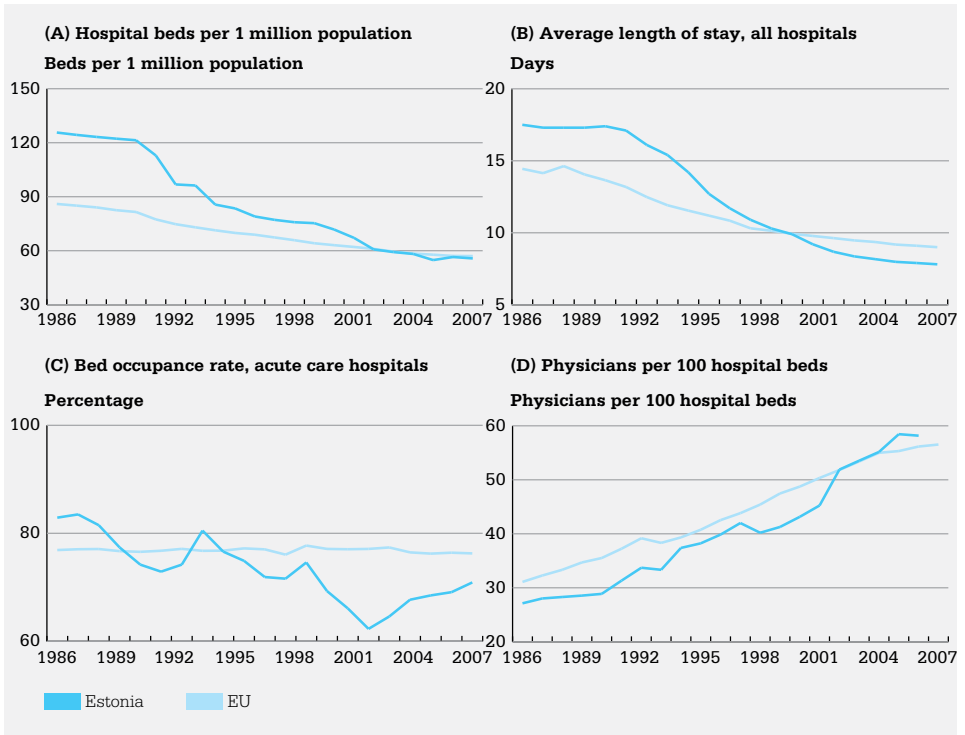
### **3.6.2. Allocative efficiency**

Proxy measures used to assess allocative efficiency are comparisons of: primary health care expenditures versus total health system expenditures; utilization of outpatient services versus inpatient services; utilization of general practitioners (GPs) versus hospitals; and rates of nurses per 100 000 population versus rates of physicians per 100 000 population.

As shown in Fig. 41 below, spending on primary health care as a proportion of total health care spending by the Estonian Health Insurance Fund has stayed constant since 2004 (Fig. 41). It should be noted that prescription pharmaceuticals available through access to primary health care practitioners are not included in these calculations.

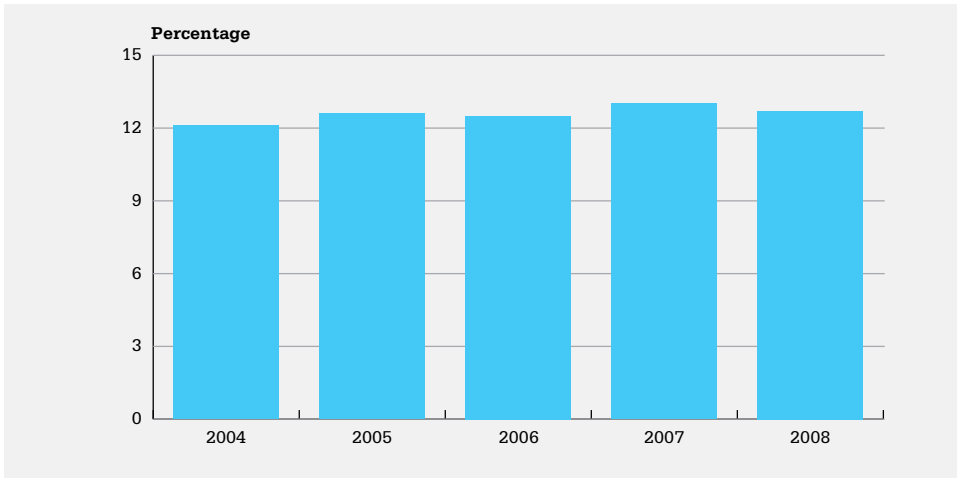


**Fig. 37–40 Measures of technical efficiency of the health system, Estonia and the EU, 1986–2008 (or latest available)**



Source: European Health for All database (45).

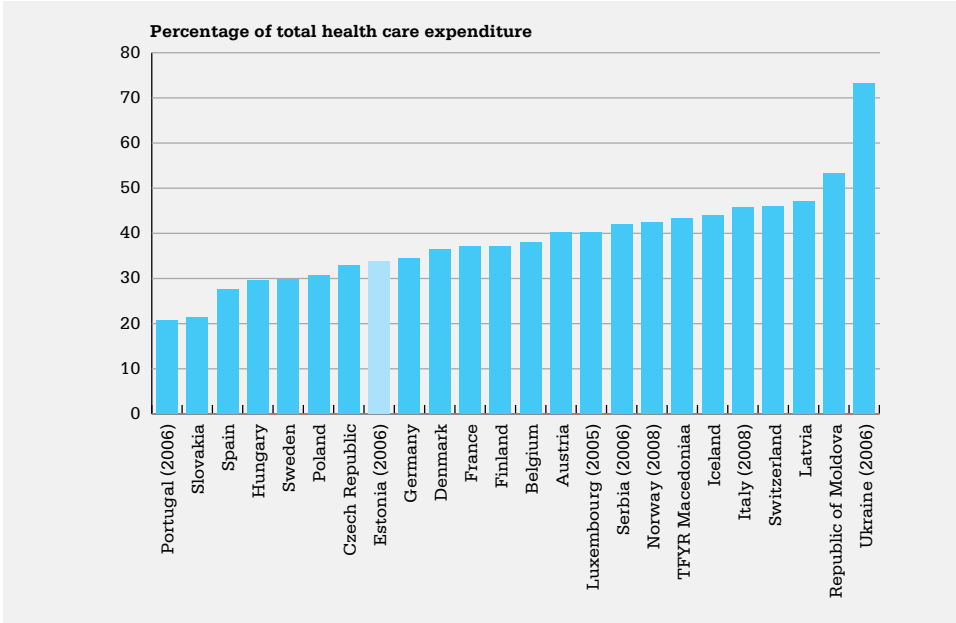
**Fig. 41. Primary health care expenditures as a percentage of total Estonian Health Insurance Fund expenditures**



Source: Annual reports [web site] (77).

Fig. 42. shows that for the most recent year available spending on inpatient care as a proportion of total spending on health care in Estonia was lower than for many European countries, which seems logical since Estonia has limited fiscal capacities and dedicates less funding to the health system compared with many other European Countries.

**Fig. 42. Inpatient expenditure as a percentage of total health care expenditure, selected countries in the WHO European Region, 2007 unless otherwise specified**

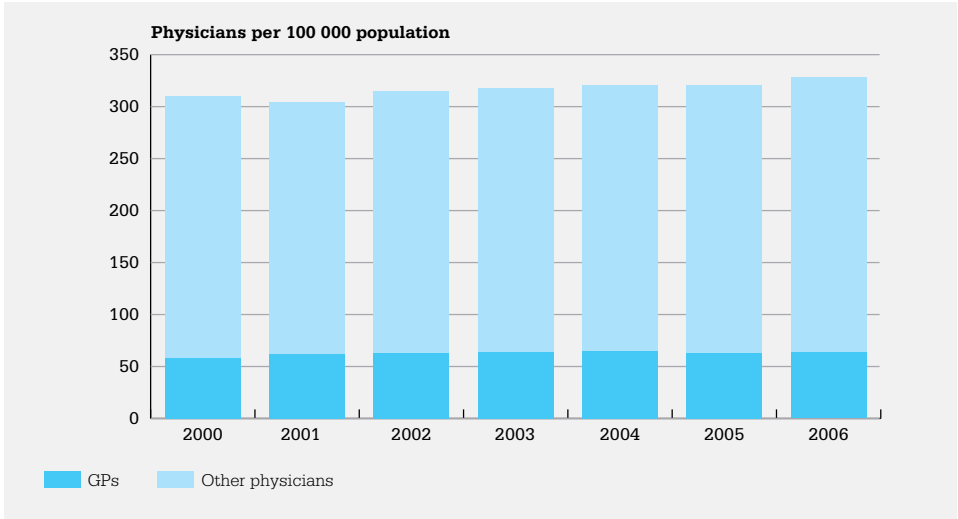


Note: a=The former Yugoslav Republic of Macedonia.  
 Source: European Health for All database (45).

Fig. 43 shows that the percentage of physicians who are general practitioners in Estonia has remained at about 20% since 2000. This is significantly below the EU average of about 30%. However, comparisons are difficult since general practitioners in Estonia are all trained family doctors, which is not necessarily the case in other European countries.

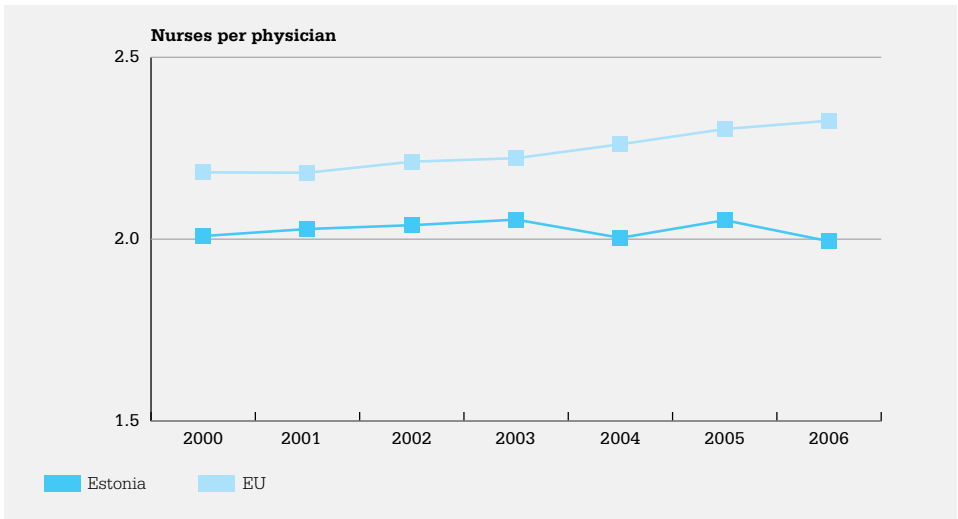
Fig. 44 shows that the ratio of nurses to physicians has remained at two to one since 2000. The gap between Estonia's results and the EU average has also widened over this time and is now well below the EU average of about 2.3 nurses per physician. This suggests that there may be opportunities for shifting to more effective service delivery models, such as appropriately trained family health teams in which more nurses might be able to support greater physician productivity by taking on certain routine tasks currently performed by physicians.

**Fig. 43. Total physicians per 100 000 population: GPs and other physicians, 2000–2006**



Source: European Health for All database (45).

**Fig. 44. Ratio of nurses per physician, Estonia and the EU, 2000–2006**

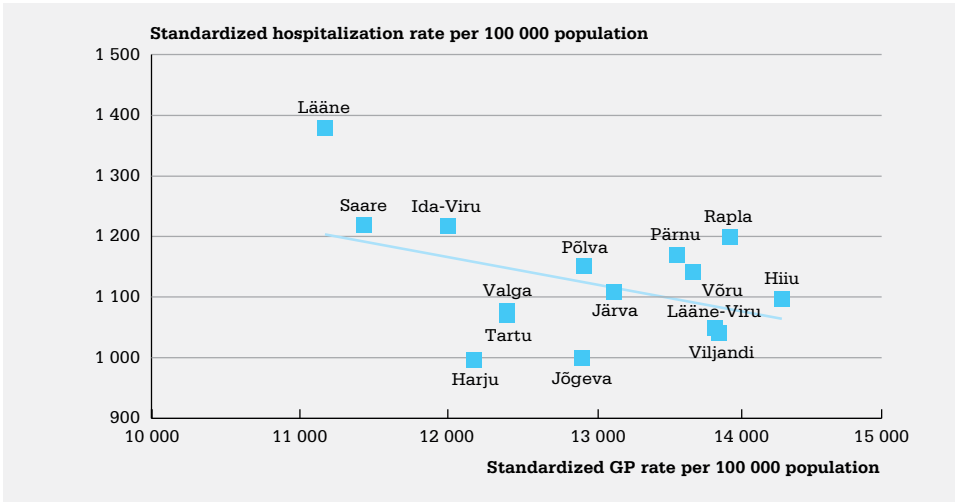


Source: European Health for All database (45).

Finally, Fig. 45 shows the relationship between utilization of hospitals and GPs for the different counties of Estonia. The three counties with the highest hospitalization rates

have the lowest rates of utilization of GPs: Laane, Saare and Ida-Viru. This strongly suggests inefficiency in the allocation of resources between hospitals and primary care in these counties and perhaps that hospitals are used heavily in these counties because of inadequate access to primary care. This could be further investigated by analysing hospitalization rates for conditions sensitive to ambulatory care<sup>11</sup> (79).

**Fig. 45. Distribution and correlation between the standardized hospitalization rate and GP contact rate in Estonia's counties, 2006**



Sources: Standardised death rate per 100 000 population by cause of death and county [online database] (80) and unpublished data, Estonian Health Insurance Fund.

Hence although it seems that there have been substantial efficiency gains through hospital and primary health care restructuring over the last decade, there seem to be opportunities for further improvements in technical and allocative efficiency in both sectors in Estonia.

11 Many chronic illnesses, including diabetes, asthma and high blood pressure, can be effectively managed in the community with appropriate screening, monitoring and follow-up. Combined with education and support for people to manage their own conditions, such practices can potentially reduce the number of hospital stays by people with one or more chronic conditions. These chronic conditions that can potentially be managed in the community are also referred to as ambulatory care-sensitive conditions. Although not all hospitalizations for ambulatory care-sensitive conditions are avoidable, appropriate ambulatory care may prevent or reduce the need for hospitalization (78).

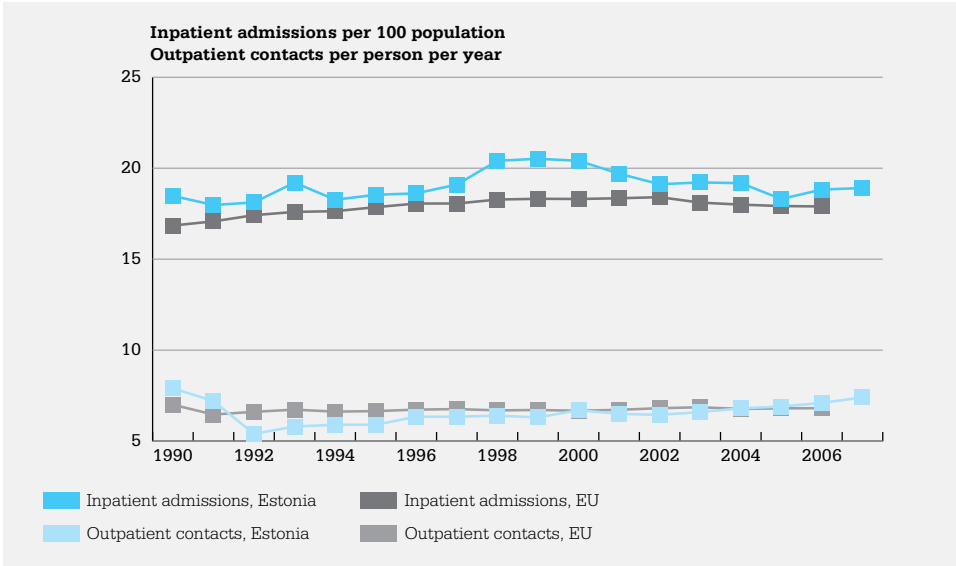
## **3.7. Access to health care services**

Various aspects need to be considered in assessing how health systems perform in providing access to health care services. For example, an increased utilization of services can reflect fewer barriers to access, but utilization on its own indicates only what services were delivered and little about whether everyone who could benefit from the services had access to them. Similarly, even though individuals might have been able to access health care services, utilization does not indicate difficulty in accessing them, such as out-of-pocket payments, physically travelling to a service, location or the length of time spent waiting to access them. More thorough assessment of access thus means examining utilization together with measures of waiting times for services and variation in utilization among population subgroups. In addition, users' satisfaction with access to health care is another important component of this performance dimension.

### **3.7.1. Utilization of health care services**

Fig. 46 shows utilization rates of inpatient admissions per 100 population and outpatient contacts per person per year. The rate for inpatients fluctuated in the early 1990s and declined slightly from over 20 per 100 population in 2000 to less than 19 in 2007. In contrast, the rate for outpatients has increased steadily since 1992. Both rates have been close to the EU averages since 2002.

**Fig. 46. Inpatient and outpatient care utilization, Estonia and the EU, 1990–2007**



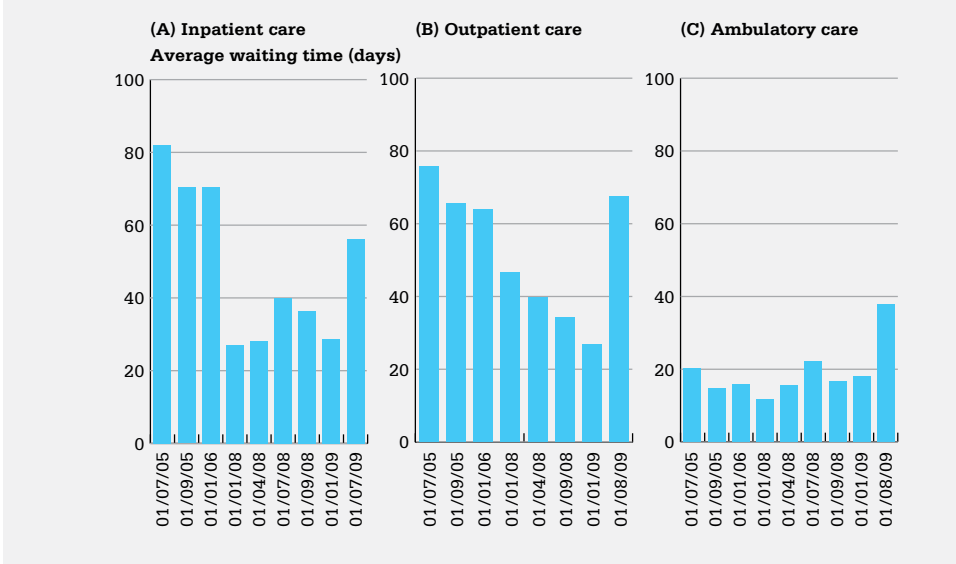
Source: European Health for All database (45).

### 3.7.2. Waiting times for health care services

The Estonian Health Insurance Fund supplies two sources of data on hospital waiting times: waiting list data and information from patient satisfaction surveys. Fig. 47 is based on hospital data and shows the average waiting time in days for inpatient, outpatient and ambulatory care on a random day in 2005, 2008 and 2009, as determined from data reported by the Estonian Health Insurance Fund. For inpatient and outpatient care, average waiting times declined dramatically between 2005 and 2008, but the most recent results, for 2009, show increases. For ambulatory care, waiting times changed little between 2005 and 2008 but increased in 2009.

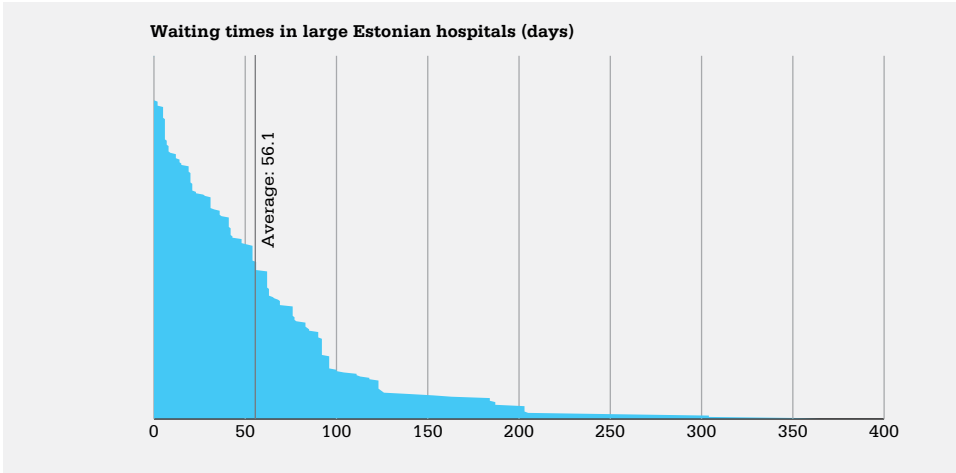
Although average waiting times are reported, the distribution of waiting times is often highly skewed, as illustrated in Fig. 48 showing the distribution of inpatient waiting times in large hospitals on 1 July 2009. Although the average was just under 60 days, many patients had a wait which was longer than 100 days (in most cases for highly specialized and rare specialities or procedures).

**Fig. 47. Average waiting times in days for (A) inpatient, (B) outpatient and (C) ambulatory care, 2005–2009 as available**



Sources: Ravijärjekorrad [Waiting times] (81) and unpublished data, Estonian Health Insurance Fund.

**Fig. 48. Distribution of waiting times for inpatient care in large Estonian hospitals on 1 July 2009 (all available combinations between hospital, specialty and patients' home county on vertical axis)**

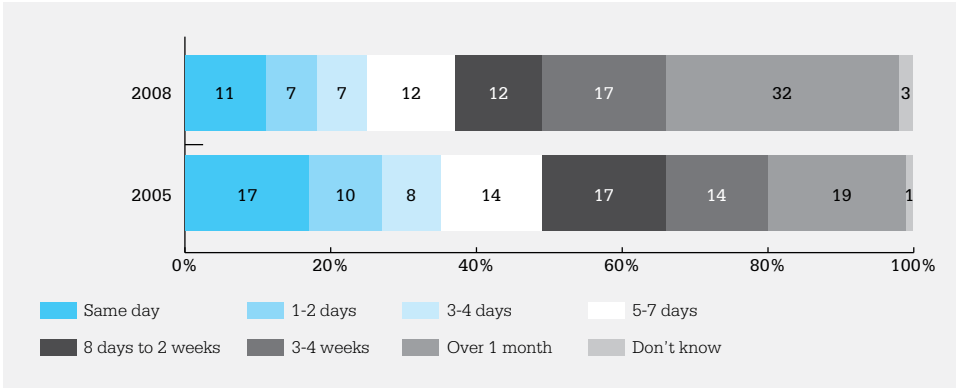


Sources: Ravijärjekorrad [Waiting times] (81) and unpublished data, Estonian Health Insurance Fund.



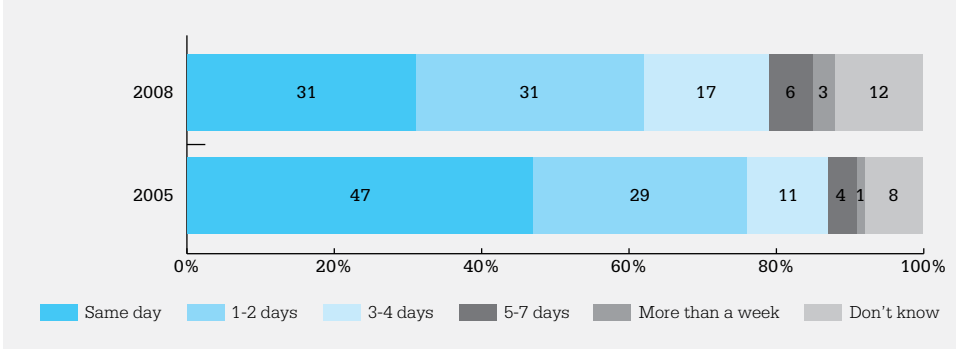
In 2005 and 2008, about 98% of those surveyed on length of time waiting to access health care services provided information on wait for specialized services and about 90% for GPs. Fig. 49 and 50 show that nearly one third of the respondents reported waiting more than one month for a specialist visit in 2008 compared with one fifth in 2005; for GPs visits, the percentage reporting waiting times of less than three days dropped from 76% in 2005 to 62% in 2008. However, even in 2008, nearly 80% of patients waited fewer than five days to see a GP.

**Fig. 49. Percentage of respondents reporting waiting times for specialist services (number of days between registration and visit), 2005 and 2008**



Sources: Elanike hinnangud tervisele ja arstiabile, 2005 [Population satisfaction with health and health care, 2005] (63) and Elanike hinnangud tervisele ja arstiabile, 2008 [Population satisfaction with health and health care, 2008] (64).

**Fig. 50. Percentage of respondents reporting waiting times for GPs (number of days between registration and visit), 2005 and 2008**



Sources: Elanike hinnangud tervisele ja arstiabile, 2005 [Population satisfaction with health and health care, 2005] (63) and Elanike hinnangud tervisele ja arstiabile, 2008 [Population satisfaction with health and health care, 2008] (64).

### 3.7.3. Equity in utilization of health care services

As outlined by Kutzin (66), if financial barriers to utilization of services are too prohibitive for some individuals, they may not use health care services at all. Conversely, low out-of-pocket expenses do not necessarily mean that these user charges did not create inequities in access to health care services. Variations in the utilization of services must therefore also be considered.

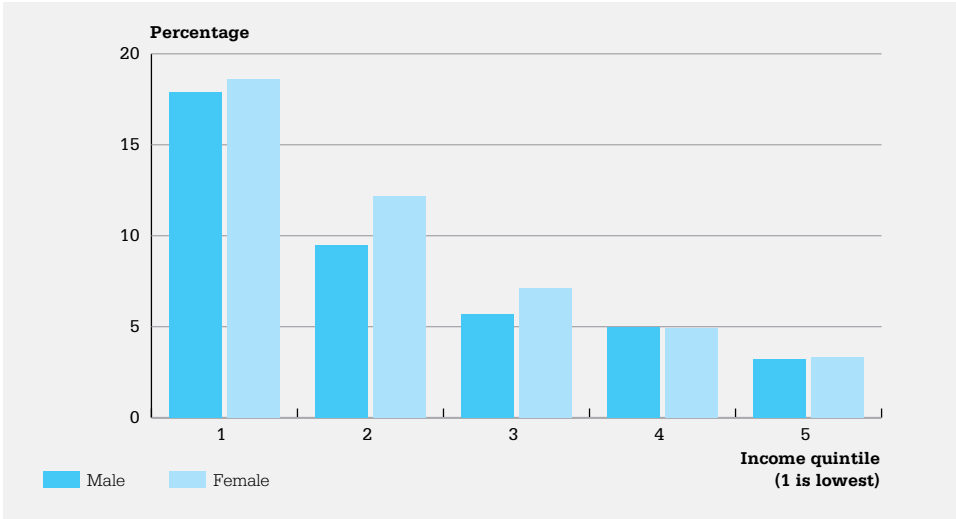
Equity in the utilization of services means that health services and resources are available to individuals based on their need for services and not according to such factors as their ability to pay, their area of residence or their ethnic group. The survey results reported in the previous section suggest that inequity in utilization would be expected.

An analysis of survey data for those with at least one contact with the health system during a month for dental care, phone consultations, specialist care and day treatment services has shown that:

- » people with higher incomes more often use dental care, phone consultations, and perhaps day treatment services;
- » there appear to be no differences in the utilization of specialist care and day treatment; and
- » utilization of specialist care seems to be higher in the middle-income group (70).

These results indicate potential inequities even if more information and analysis are required to come to a firmer conclusion about the extent of such inequities. For example, one complication is that those in the lower income quintiles probably need more health care, and hence even if utilization rates were equal, this could still not meet their needs. But even these crude data suggest inequities in access to dental care, which is to be expected, as user charges for dental visits at the point of delivery are likely to deter use by people with lower incomes. A higher proportion of those in the lower income quintiles reported problems in accessing dental care (Fig. 51).

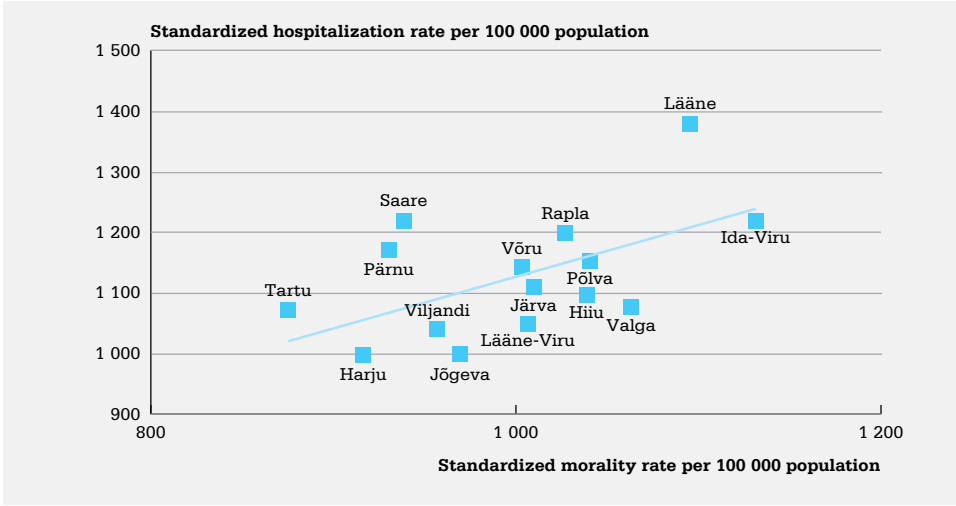
**Fig. 51. Percentage of the population reporting problems accessing dental care services, by income quintile and sex, 2008**



Source: unpublished data, Statistics Estonia.

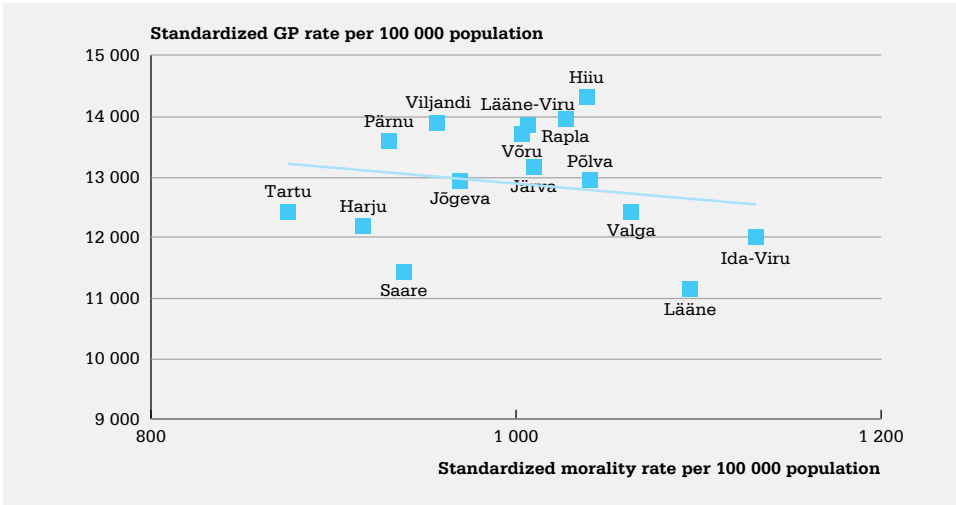
Fig. 52 and 53 show relationships between standardized mortality rates (SMRs) and rates of utilization of GPs and hospitals across Estonian counties. As the SMR is a good indicator of relative need for health care (82), if utilization were related to need, these should coincide: that is, counties with a high SMR should also have high rates of utilization of GP services and hospitals and vice versa; however, this relationship is not observed. Indeed for GP services, Hart’s inverse care law seems to operate: “the availability of good medical care tends to vary inversely with the need for it in the population served” (83). These two figures suggest that the health care resources, and hence utilization of services, are not distributed in the counties of Estonia according to relative needs of the population, therefore driving inequities in access to health care services. Fig. 52 and 53 put into relation low and high standardized mortality rates and rates of utilization of health care services. These figures highlight regional health inequities: Lääne has by far the highest hospitalization rate with a lower SMR than Ida-Viru when Ida-Viru has the highest SMR but a similar hospitalization rate to that of Saare, which has a low SMR (Fig. 52); Ida-Viru and Lääne have the highest SMRs but have low rates of utilization of GP services (Fig. 53). Further analysis should be carried out and inform the planning of health care services in order to better match the needs of the population.

**Fig. 52. Distribution and correlation between the standardized mortality rate and hospitalization rate in Estonia's counties, 2006**



Source: Standardised death rate per 100 000 population by cause of death and county [online database] (80) and unpublished data, Estonian Health Insurance Fund.

**Fig. 53. Distribution and correlation between standardized mortality rate and GP contact rate in Estonia's counties, 2006**



Source: Standardised death rate per 100 000 population by cause of death and county [online database] (80) and unpublished data, Estonian Health Insurance Fund.

## 3.8. Quality and safety of health care services

The quality of health services can be broadly defined as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” (84). Quality of care means receiving the right care from the right professional in the right setting at the right time. Important components of quality include delivering consistently evidence-based best practices, coordinating care across patient conditions, services and settings over time, preventing harmful errors in care (safety) and improving clinical effectiveness. This section examines clinical outcomes and other measures of the quality and safety of health care services with available data and proposes additional measures for future use.

### 3.8.1. Clinical outcomes

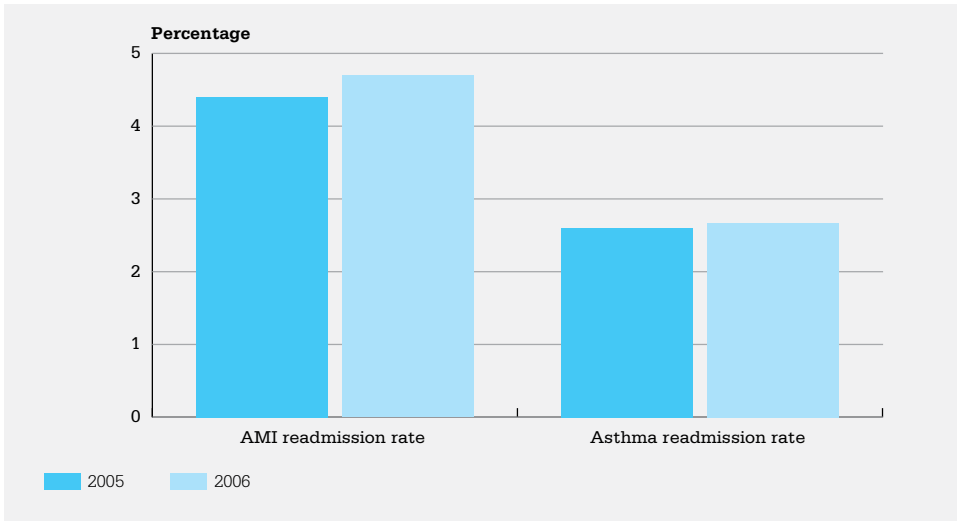
Indicators of hospital readmission rates are available for acute myocardial infarction and asthma. They point to the effectiveness of health care processes, of either care provided in the hospital or of the quality of the coordination between hospital-based services and follow-up services provided in the community.

As shown in Fig. 54, the readmission rate<sup>12</sup> for acute myocardial infarction increased slightly from 2005 to 2006, while the rate for asthma stayed constant. However, trend data would be necessary to assess performance. There are limited international comparisons available; however, results for readmissions following acute myocardial infarction and asthma have been reported for Canada for the three-year period 2005–2007. The readmission rate for acute myocardial infarction was 5.1%, with regional rates as low as 4.0%; the readmission rate for asthma was 4.5%, with regional rates as low as 3.8% (78). Although these rates are somewhat higher than those shown in Fig. 54, discrepancies in methods (such as which cases are included or excluded or counting readmissions to other hospitals) might account for differences. In the absence of longer-term trends and targets for Estonia and additional international comparisons, assessing the scope for improving current performance is therefore difficult.

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12 This indicator counts the patients re-hospitalized within 30 days of initial discharge for the same diagnosis and excludes cases with a referral from the initial discharge.

**Fig. 54** Readmission rates for acute myocardial infarction (AMI) and asthma, 2005 and 2006



Source: unpublished data, Estonian Health Insurance Fund.

### 3.8.2. Other indicators of the quality and safety of health care services

The measures reported above are the only ones currently available to assess the quality and safety of health care services. Although the National Health Plan 2009–2020 indicates that access to high-quality health services is a priority, very few data are available to support indicators related to the quality of health care services. In addition to the readmission indicators presented above, several potential indicators are commonly reported internationally and would be useful if data were available (Table 5).

**Table 5. Potential indicators of the quality and safety of health care**

Indicators	Content
Indicators of clinical outcomes and of effectiveness	<ul style="list-style-type: none"><li>• Outcomes based on patients' perspectives such as:<ul style="list-style-type: none"><li>» Patient-reported outcome measures</li><li>» SF-36 Health Survey</li></ul></li><li>• Ambulatory care-sensitive hospitalization rates</li><li>• 30-day mortality following acute myocardial infarction and stroke</li><li>• 5-year survival rates for selected types of cancer</li></ul>
Indicators of patient safety	<ul style="list-style-type: none"><li>• Surgical site infection rates</li><li>• Other infections acquired in hospital</li><li>• Incidence of drug-resistant bacterial infections (such as methicillin-resistant <i>Staphylococcus aureus</i>)</li><li>• Medication error rates</li><li>• Other adverse events such as falls, and the development of skin ulcers</li></ul>
Indicators of the quality of care processes	<ul style="list-style-type: none"><li>• Development and adoption of evidence-based clinical practice guidelines</li><li>• Extent of adherence to evidence-based guidelines (such as using recommended medication following acute myocardial infarction, regular eye and foot examinations for people with diabetes type II and screening procedures for target populations)</li></ul>

Given how important the quality of care is in ensuring safety (ensuring that care does not inadvertently harm individuals) and in improving the outcomes of health care services, some of the indicators identified above should be included in the next health system performance assessment or even as an additional report focusing on quality.

# SECTION 4. ACCOUNTABILITY FOR IMPROVING HEALTH SYSTEM PERFORMANCE

As mentioned earlier, one of the objectives of health system performance assessment is to promote transparency and accountability for health system performance to achieve measurable results (16). This chapter proposes practical steps to translate information in ways that are useful for policy-makers to make better decisions and to strengthen the accountability of the health system for improving performance on key indicators directly linked to health system strategies in Estonia. The aim of this chapter is to offer further guidance to the Ministry of Social Affairs in considering what needs to be done to improve the performance of the health system in Estonia. It consists of three sections that:

- » review the literature on pathways for improving performance measurement and identify which pathway the evidence suggests is most effective;
- » link performance assessment to accountability and illustrate how an analytical grid of the delivery chain can show where there is weak or strong accountability for improving performance on key indicators in Estonia; and
- » present a possible way of synthesizing results of performance assessment to give a clear overview of the performance of the health system in Estonia and identify where accountability needs to be improved or investigated.

## 4.1. Evidence on pathways to improve health system performance

The literature on performance measurement identifies four pathways to improvement (8,85–90):

- » the change pathway, in which providers use comparative information to improve performance;
- » the selection pathway, in which health system users use comparative information as consumers to change from poor to good performers;



- » pay for performance, in which providers who achieve measured standards or targets receive financial rewards; and
- » reputational damage, in which providers who perform poorly suffer damage to their public reputation from regular public reports that rank providers' performance.

Berwick et al. (85) recognized that each of the first two pathways is problematic. The obstacles to the selection pathway include: the information available not being timely, specific, or easily understood; and patients not being aware of differences in performance or the availability of information. One obstacle to the change pathway is that this requires that much more detailed information be available to providers. For selection, it is enough for patients to know that, for example, hospital A is better than hospital B at controlling surgical infections. Change requires that hospital B know why its infection control is worse than A and what programme of action is required, and that hospital B successfully implement that programme. Systematic reviews of the literature on performance measurement have found little evidence that either of these two pathways is effective (88,91).

The third pathway, pay for performance, has emerged recently as the newest innovation in the use of performance measurement in the United States and the United Kingdom. An example for hospital care is the Premier Hospital Quality Incentive Demonstration by the United States Centres for Medicare and Medicaid, which is currently being piloted in the North West Strategic Health Authority of the National Health Service in the United Kingdom. This focuses on process measures for the treatment of acute myocardial infarction, heart failure, pneumonia, coronary artery bypass grafting and hip and knee replacements. As Maynard (90) observes, although this approach demonstrated improvement in the United States of America, this needs to be verified in a controlled setting. Lindenauer et al. (92) examined hospitals already reporting the quality of care (in the Hospital Quality Alliance) and compared those with and without pay for performance in the Premier Hospital Quality Incentive Demonstration and found modest improvements in hospitals with pay for performance. In the United Kingdom substantial additional payments have been made to GPs for achieving performance targets for processes of care, through the quality outcomes framework. However, Smith et al. (8) observed that: "so far, it has not been possible to attribute any major improvements in general-practitioner performance, or other system improvements, to this bold (and very expensive) experiment". In each case, bold experiments have been implemented wholesale in the absence of a proper experimental design, creating difficulty in interpreting the effects of pay for performance. One problem, for

example, with a poorly designed pay-for-performance scheme is that it can produce little improvement in quality for the money spent; in fact it can largely reward those with better performance at baseline (93).

Smith et al. (8) and Maynard (90) carefully examined the first three pathways. Neither examines the fourth pathway of reputational damage, known in the United Kingdom as naming and shaming, which has been central to government policies to improve performance in the United Kingdom through the publishing of league tables (94). This has been famously applied to schools (with league tables of examination results) (95); and National Health Service hospitals (with star ratings dominated by performance in achieving targets for waiting times (96–102). The conceptual foundations for naming and shaming were developed through research led by Judith Hibbard in the United States of America over a decade into the characteristics required for a system of performance measurement to have an impact (86, 103–112). Hibbard et al. (106) showed, in a controlled laboratory study, that comparative performance data were more likely to be used if they were presented in a ranking system that made it easy to discern the high and low performers.

Hibbard et al. (86) hypothesized that four characteristics are required for a system of performance measurement to have an impact and effect change: performance measurement systems should:

- » have a ranking system;
- » be published and widely disseminated;
- » be easily understood by the public so that they can see which providers are performing well and which poorly; and
- » be followed up by future reports that show whether performance has improved or not.

Hibbard et al. (86, 108) tested these four requisite characteristics for the effectiveness of performance measurement in a controlled experiment, based on a report on performance measurement in southern central Wisconsin that ranked the quality of care of 24 hospitals<sup>13</sup>. The effects of reporting were assessed across three sets of hos-

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13 This report used two summary indices of adverse events (deaths and complications): within broad categories of surgery and non-surgery and across three areas of care (cardiac, maternity, and hip and

pitals: public report, in which performance measurement was published and widely disseminated; private report, in which performance measurement was reported to managers but not published; and no report, in which no performance measurement information was reported. This research found that the hospitals in the public report set made significantly greater efforts to improve quality than those in the other two sets (86,108). Further, the managers of hospitals shown to have been performing poorly in the public report set drove improvement, since they wanted to remedy the damage caused to their hospitals' public reputation; they did not anticipate the report being likely to reduce their market share though (86), and later analysis showed their anticipation to have been correct (108). The power of reputational damage is also illustrated by evidence from one of the most closely examined systems of performance measurement (88), the Cardiac Surgery Reporting System of the New York State Department of Health, the first and longest-running state-wide programme in the United States to produce public data on risk-adjusted death rates following coronary artery bypass grafting surgery (113,114). Chassin (113) emphasized that the key driver of change was the reputation pathway through adverse publicity from the identification of outlier hospitals performing poorly and that "market forces played no role". These studies produced evidence supporting the effectiveness of the reputational pathway compared with the change and selection pathways (115).

The crucial point is that public reporting is a necessary but not sufficient condition for performance measurement to have an impact. Lindenauer et al. (92) compared outcomes for pay for performance (in the Premier Hospital Quality Incentive Demonstration) with public reporting (in the Hospital Quality Alliance) in a system that did not rank hospitals but was designed to put pressure on hospitals via the selection pathway (by informing patients about the relative performance of local hospitals), which studies have consistently found to be an ineffective way of using performance measurement. The evidence from the United States on the reputation pathway is fragmented and on a small scale – a one-off experiment across 24 hospitals in Wisconsin and a sustained performance measurement system in New York State on one type of cardiac surgery only. The evidence from the United Kingdom on the reputation pathway, however, is massive. Various studies have consistently confirmed the excellence of performance in England in reducing hospital waiting times from the scheme of star ratings compared with other countries (Australia, Canada, England, New Zealand, Scotland and Wales (102,116–118).

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knee). The report showed material variation (unlike insignificant differences in ranking in league tables) and highlighted hospitals with poor scores in maternity care (eight) and cardiac care (three).

## 4.2. Linking performance measurement and accountability

From a health system stewardship perspective, this evidence shows that public reporting of indicators of health system performance is not sufficient to affect performance and that other conditions must be met. The experience of the delivery team working under the Prime Minister in the United Kingdom between 2002 and 2007 or the Veterans Health Administration experience between 1995 and 1999 in the United States of America or a more recent experience in Ontario, Canada, linked to these two experiences, showed great success in linking performance measurement and accountability for improving performance (5,94,119). The link between performance measurement and accountability means that performance indicators supporting performance improvement requires meeting several conditions:

- » The data required for the performance indicator exist, and are collected routinely and audited for accuracy and gaming;
- » Responsibility and accountability for delivery are clearly defined and understood by those involved in the delivery chain, with sanctions for failure and rewards for success; and
- » The performance indicator is understood by and reported regularly to those who are responsible and accountable for delivery and also published and widely disseminated in ways that cause reputational damage for failure.

Thus, the conditions required for improving health system performance can be translated into key questions for each performance dimension or indicator, which can show the strength of the accountability regime associated to this performance indicator (also called delivery chain).

- » Are data collected routinely?
- » Are targets set for improving performance?
- » Is it clear who is responsible and accountable for delivery?
- » Is a strategy in place with a clear delivery chain on how to improve performance?
- » Is performance reported regularly to the people who are responsible and accountable for delivery?

- » Is performance information published and widely disseminated in ways that cause reputational damage for failure?
- » Is it clear what consequences follow from failure to deliver performance?

As an illustration, three performance themes were assessed in terms of their degree of accountability:

1. improving the health status of Estonians and reducing the gap between males and females;
2. improving the responsiveness of Estonia's health care; and
3. addressing risk factors to improve population health (see table 4 below).

The way we derived the assessments of Table 4 was that members of the team who produced this report proposed initial assessments which were reviewed by a group of Estonian policy-makers. The assessments given here are the agreed outcomes of this process. For each theme accountability is strong in terms of the performance indicator data are collected routinely (although biannually for two of the themes), targets with timelines were developed, responsible agencies or ministries can be identified. There are however, weaknesses for themes 1 and 3: regular performance reporting could be improved; and failure to perform has no consequences. This means that there is no clear delivery chain for these two themes and hence their performance is unlikely to improve.

### **4.3. An overview of the performance of the health system in Estonia**

If information on health system performance assessment is to have an impact, it must be presented in ways that are simple and clear to policy-makers and the public. This can be done by presenting performance information in a synthesized way, either by performance dimension or for the whole health system. An example of this can be found in the executive summary of this report, where results of this performance assessment are presented in an analytical form pointing out at the strengths, weaknesses, opportunities and threats related to the health system in Estonia. Another useful way to present performance information is to present health system performance indicators from two different perspectives: variation in performance over time and variation against selected benchmarks (or comparators). Fig. 55 illustrates how the

set of performance indicators selected for this report could be presented to decision-makers. The chart shows at a glance whether performance is improving and whether it is favourable compared with predefined benchmarks (standards, international or regional comparators). This representation can help to determine priorities for policy intended to improve performance. Although this approach does not indicate the magnitude of the favourable or unfavourable comparison, it still graphically illustrates priorities for action and can be a promising practice for governments to concretely benchmark the health system. Fig. 55 uses the colours of traffic lights: green indicates performance that is likely to be good; yellow, satisfactory; and red, poor. In practice, an expert group composed of national and international experts met to discuss the results of the health system performance assessment and grouped them as much as possible into the grid.

The previous section suggested that there are good systems for ensuring delivery of performance on the responsiveness of Estonia's health care and none these indicators are in the red zone. It also suggested weaknesses in: ensuring delivery of performance on improving the health status of Estonians, reducing the gap between males and females and addressing risk factors to improve population health. These indicators are in the red zone. This exploratory analysis hence suggests that delivery chains for these performance indicators need to be developed and those for the other indicators in the red zone ought to be examined.

**Table 6. Assessment of conditions for three themes related to improving the performance of Estonia's health system**

Conditions for improving performance	Improving the health status of Estonians and reducing the gap between males and females	Improving the responsiveness of Estonia's health care	Addressing risk factors to improve population health
Data routinely collected	Yes	Yes, through annual surveys	Yes, through a regular population survey on health behaviour conducted every two years
Targets available with clear timeline	<ul style="list-style-type: none"> <li>Life expectancy 75 years for males and 84 years for females by 2020</li> <li>Health-adjusted life expectancy 60 years for males and 65 years for females by 2020</li> <li>Infant mortality 2.6 per 1000 live births by 2020</li> <li>Percentage of children assessing their health as good or reasonably good 35% by 2020</li> </ul>	<ul style="list-style-type: none"> <li>Percentage of insured people satisfied with the health system: 63% for 2008</li> <li>Timely access of insured people to consultation by a specialist physician: 99% for 2008</li> <li>Percentage of insured people satisfied with the quality of medical care: 72% for 2008</li> <li>Percentage of insured people satisfied with the health benefit package: 52% for 2000</li> </ul>	<ul style="list-style-type: none"> <li>Tobacco consumption: daily smokers &lt;30% among men and &lt;10% among women by 2020</li> <li>Obesity: among adults, &lt;25% overweight and &lt;12% obese by 2020; among schoolchildren, &lt;6% overweight or obese? by 2020</li> </ul>
Clarity in responsibility and accountability	The Ministry of Social Affairs is responsible for achieving targets	Estonian Health Insurance Fund	Ministry of Social Affairs and National Institute of Health Development
Delivery chain defined in strategy/ or policy endorsed by the government	National Health Plan 2009–2020, but the delivery chain is not clearly defined	Annual report of the Estonian Health Insurance Fund in 2008 with rather clear delivery chain	National strategy for prevention of cardiovascular diseases 2005–2020
Regular reporting of performance to those responsible in the delivery chain	Yes, but only every two years	Yes, every year	Yes, discussed every year with the Ministry of Social Affairs and Council of Strategy, but not published

Conditions for improving performance	Improving the health status of Estonians and reducing the gap between males and females	Improving the responsiveness of Estonia's health care	Addressing risk factors to improve population health
Regular publication of performance in ways that cause reputational damage for failure	To be done	To be done	To be done
Consequences for failure to perform	No	Yes, incentives are in place to stimulate the achievement of targets	No



**Fig. 55. An overview of health system performance in Estonia**

Change in performance overtime	Level of performance		
	Good	Satisfactory	Poor
Improving	<ul style="list-style-type: none"> <li>• Infant &amp; child mortality rate: fast decrease to the EU level</li> <li>• Satisfaction with PHC system; high and improving</li> <li>• Satisfaction with quality of health care services; perception of quality high at 72% in 2008 and improving</li> <li>• Avoidable mortality vs. overall mortality: substantial decrease of avoidable mortality over the years</li> <li>• Immunization rates for 2-year-olds; 97% high at EU level</li> </ul>	<ul style="list-style-type: none"> <li>• Weekly physical activity for overall population 36% improving</li> <li>• Self assessed health; one person out of two rated his/her health as good or very good</li> <li>• Hospital beds per 100 000 population comparable to EU</li> <li>• Average length of stay in hospitals comparable to EU</li> <li>• Number of physicians/100 hospital beds comparable to EU</li> <li>• Total government health expenditures as % of government budget increased at 12% but still below EU average (14%)</li> <li>• Increase in use of pharmaceuticals (000s) for different disease groups</li> </ul>	<ul style="list-style-type: none"> <li>• Life expectancy; Estonia ranks 25 out of 27 in the EU, improving faster than EU average</li> <li>• High mortality and avoidable mortality in males before 65</li> <li>• High variation in bed occupancy rate in acute care hospitals</li> <li>• Annual HIV Incidence is improving but still a concern</li> </ul>
No Change	<ul style="list-style-type: none"> <li>• Satisfaction with hospital care; level high at 92% and stable</li> <li>• Number of years in education for total population; at around 18 years, higher than EU average, stable since 2004</li> <li>• Access to clean drinking water; high in most of the country except in some rural areas</li> </ul>	<ul style="list-style-type: none"> <li>• 60% satisfied with health care system but no time trend</li> <li>• 52% satisfied with access to health care services with slight improvement</li> <li>• 45% satisfied with benefit package, no overall improvement</li> <li>• Share of PHC budget in EHIF services budget slight increase</li> <li>• Ratio of contributing to equalized persons in EHIF pool stable at around 50%</li> <li>• Hospital readmission rates for AMI and asthma; level seems favorable but performance not improving 2006/2005</li> </ul>	<ul style="list-style-type: none"> <li>• Overall health system financing becoming less progressive</li> <li>• Rapid unemployment increase at 13% in 2009 due to crisis</li> <li>• Energy intake (sources); level of sugar high and rising</li> <li>• % uninsured around 5% increase due to unemployment</li> <li>• Gender gap in LE stable at high level, far from EU average</li> <li>• DFLE for males stable and low level / EU at 51 years</li> <li>• Daily exercise for 16 to 24 old stable for females at low level</li> <li>• Nurses/doctors ratio stable with low number of nurses</li> <li>• Low uptake of generic medicines</li> <li>• Daily smoking decreased substantially over time but progress stalled and worse than EU</li> </ul>

Change in performance overtime

Worsening

- Ease of access to PHC self-reported waiting times for PHC slightly worse but still within targets

- Proportion of households impoverished due to OOP increasing but relatively low / new EU countries
- Percentage of overweight for adolescents worsening

- Change in proportion of PviHE vs. THE increased with higher burden to low income group from OOPS
- Hosp. waiting times; trend unclear latest data show increase
- Consumption pure alcohol increased until recently, high / EU
- Overweight & obesity increased for all age groups, high / EU
- Access to dental care poor and worsening because of financial barriers

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# ANNEX I. POSSIBILITIES FOR ADDITIONAL PERFORMANCE INDICATORS

1. Health status of Estonians		
Performance subdimensions	Potential performance indicators	Notes
Changes in mortality rates	<ul style="list-style-type: none"> <li>Maternal mortality</li> </ul>	
Other	<ul style="list-style-type: none"> <li>Dental health among children (index of decayed, missing or filled permanent tooth)</li> </ul>	Analyse by income quintile if possible to isolate the effects of socioeconomic status
2. Health behaviour and health promotion		
Performance subdimensions	Potential performance indicators	Notes
Healthier behaviours	<ul style="list-style-type: none"> <li>Low -birth-weight babies and/or percentage of women who smoke during pregnancy</li> </ul>	Analyse by income quintile if possible to isolate the effects of socioeconomic status
	<ul style="list-style-type: none"> <li>Nutrition habits (percentage of the population consuming five or more servings of fruit and vegetables daily)</li> </ul>	Analyse by income quintile if possible to isolate the effects of socioeconomic status
	<ul style="list-style-type: none"> <li>Rates of abuse of alcohol (percentage of the population reporting heavy drinking episodes)</li> </ul>	
	<ul style="list-style-type: none"> <li>Percentage of infants who are breastfed exclusively for three months</li> </ul>	
	<ul style="list-style-type: none"> <li>Cancer screening rates</li> </ul>	Could also be used as a measure of access
	<ul style="list-style-type: none"> <li>Influenza vaccination rates for older people</li> </ul>	Could also be used as a measure of access
Health promotion	<ul style="list-style-type: none"> <li>Level of population awareness of behavioural factors contributing to lower health status</li> </ul>	



### 3. Broader determinants of health

Performance subdimensions	Potential performance indicators	Notes
Environmental health	<ul style="list-style-type: none"> <li>Rate of waterborne and/or foodborne infections</li> </ul>	
Occupational health	<ul style="list-style-type: none"> <li>Non-standard or insecure employment as percentage of total employment</li> </ul>	

### 4. Health system responsiveness

Performance subdimensions	Potential performance indicators	Notes
Dignity and respect for people	<ul style="list-style-type: none"> <li>Percentage of individuals who feel that their health care provider treats personal information confidentially</li> </ul>	
	<ul style="list-style-type: none"> <li>Percentage of individuals who feel that they are sufficiently consulted and have adequate say in treatment decisions</li> </ul>	
Patient responses to quality	<ul style="list-style-type: none"> <li>Percentage of patients who indicate they received specific aspects of quality of care, such as information about medication interactions, written care plan, etc.</li> </ul>	See Commonwealth Fund references for examples of patient-oriented survey questions assessing the quality of care.

### 5. Fair financing, financial protection and health system coverage

Performance subdimensions	Potential performance indicators	Notes
Fairness of health system financing in Estonia	<ul style="list-style-type: none"> <li>Change in average household spending on health care services by: hospital care, outpatient care, medicines, etc.</li> </ul>	To determine whether changes in the patterns of health care expenditure may fall unfairly on households
Health system coverage	<ul style="list-style-type: none"> <li>Number of individuals not covered through public health insurance</li> </ul>	Focus on the people without coverage along with an analysis of who is in this group

## 6. Effectiveness and efficiency of the health system

Performance subdimensions	Potential performance indicators	Notes
Technical efficiency of the health system	<ul style="list-style-type: none"> <li>Percentage of health care expenditure used on administrative costs</li> </ul>	
Allocative efficiency of the health system	<ul style="list-style-type: none"> <li>Change in public expenditure on health care by component: inpatient, primary care, long-term care, health promotion and public health</li> </ul>	
	<ul style="list-style-type: none"> <li>Ratio of GPs or family physicians to specialist physicians</li> </ul>	
	<ul style="list-style-type: none"> <li>Percentage of initial contacts for care occurring in primary care</li> </ul>	

## 7. Access to the health system

Performance subdimensions	Potential performance indicators	Notes
Access to health care services	<ul style="list-style-type: none"> <li>Median and 90th percentile of the time used to travel to the usual place of care</li> </ul>	
	<ul style="list-style-type: none"> <li>Average consumption of medication (all or selected key ones such as chinolones, anxiolytics, and cephalospirins)</li> </ul>	
	<ul style="list-style-type: none"> <li>Geographical distribution of health human resources (such as physicians per 1 000 population by county)</li> </ul>	
Equity in utilization of health care services	<ul style="list-style-type: none"> <li>Rate of potentially avoidable emergency room visits by income quintile, and county</li> </ul>	

## 8. Quality and safety of health care services

Performance subdimensions	Potential performance indicators	Notes
Safety	<ul style="list-style-type: none"> <li>• Rate of infections acquired in hospital</li> </ul>	
	<ul style="list-style-type: none"> <li>• Rate of fractures from falls in- hospital or other long-term care institution</li> </ul>	
	<ul style="list-style-type: none"> <li>• Rate of development of stage 2 skin ulcers</li> </ul>	
	<ul style="list-style-type: none"> <li>• Rate of medication errors</li> </ul>	
	<ul style="list-style-type: none"> <li>• Incidents of drug-resistant bacterial infections</li> </ul>	
Quality (process)	<ul style="list-style-type: none"> <li>• Processes for developing and approving evidence-based clinical practice guidelines</li> </ul>	
	<ul style="list-style-type: none"> <li>• Percentage of cases treated according to evidence-based clinical practice guidelines (for selected guidelines, for example, percentage of diabetics receiving an annual eye examination)</li> </ul>	
Quality (clinical outcomes)	<ul style="list-style-type: none"> <li>• Five-year survival rates for breast, cervical and colorectal cancer</li> </ul>	
	<ul style="list-style-type: none"> <li>• In-hospital 30-day survival following acute myocardial infarction and ischaemic stroke.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Patient-reported outcome measures for clinical outcomes</li> </ul>	
	<ul style="list-style-type: none"> <li>• Ambulatory care-sensitive hospitalization rates</li> </ul>	

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