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HEALTH EXPENDITURE SCENARIOS IN THE NEW MEMBER STATES

COUNTRY REPORT ON ESTONIA

LIIS ROOVÄLI

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A brief description of the AHEAD project and a list of its partner institutes can be found at the end of this report.

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Abbreviations

AHEAD	Ageing, health status and determinants of health expenditure
EC	European Commission
ECFIN	Economic and Financial Affairs Directorate General
EEK	Estonian crown
EHIF	Estonian Health Insurance Fund
ENEPRI	European Network of Economic Policy Research Institutes
EPC	Economic Policy Committee
EU	European Union
GDP	gross domestic product
ILO	International Labour Organisation
LE	life expectancy
MoF	Ministry of Finance
MoSA	Ministry of Social Affairs
OECD	Organisation for Economic Co-operation and Development
SE	Statistics Estonia
SHA	System of Health Accounts
TFR	total fertility rate
UN	United Nations
WHO	World Health Organisation

Health Expenditure Scenarios in the New Member States

Country Report on Estonia

ENEPRI Research Report No. 45/December 2007

Liis Rooväli*

Introduction

This is the final report for Estonia for the fulfilment of the ENEPRI "Ageing, health status and determinants of health expenditure" (AHEAD) project Work Package IX, "Development of Scenarios for Health Expenditure in the Accession Economies" financed by the European Commission under the 6th Research Framework Programme. The overriding goal of the AHEAD project is to produce projections of health expenditure that will inform the health policy debate and stimulate discussion about the fiscal situation in the European Union.

The financial sustainability of health care system is an increasingly important issue of public policy overall in the world. By ageing populations these debates become more active. Long term projections to analyse the sustainability of health financing and to develop adequate policy measures are essential.

Estonian health care expenditures as share of GDP are among the lowest within the European Union. Discussions about health expenditures and adequacy of health care resources have been active almost twenty years in Estonia. Estonian health insurance system was one of the first in Eastern Europe established to guarantee the targeted annual health budget free of annual political debates and decisions. During the last decade the discussions about health expenditures changed the direction touching more and more sustainability issues. Like in other developed countries, Estonian population is ageing due to decreased fertility, negative natural growth and increase in life expectancy (Rooväli, 2006).

The aim of the study is to analyse impact of ageing to health care expenditures developing different health expenditures and revenues scenarios for Estonia. Projections were performed using the ILO social budget model. The report gives a brief overview of the description of the model; data and underlying assumptions used for prognoses, and projected baseline results together with performed sensitivity analyses.

1. Health care expenditure models applied in the country

Since 2002 several studies to analyse and model health expenditures in Estonia were performed. A brief overview of them follows.

A study "Analysis of money flows to specialist care 2002–2030" (2002) was performed to analyse money flows to specialist care at national level to find best possible solutions to cover capital investments of health care providers before hospital sector reform in Estonia. The study was financed by the World Bank.

The Social budget model was used by Võrk et al (2005) to model family benefits and benefits to disabled people. The same model was further used by Võrk et al (2005) to analyse sustainability

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of Estonian health care financing system. Like in AHEAD project the base year for projections was 2003, target year 2050. Dynamics of different financing sources was studied. Analysing sustainability of health insurance system modelling both revenue and expenditure side was used. According to projections health insurance expenditures would remain at the level of 4.4% of GDP. Enlargement of basis for health insurance contribution was proposed. Study was financed by the Estonian Parliament. Later, the some actual political decisions to enlarge the health insurance contribution base followed.

Like other EU countries Estonian health expenditures were modelled by DG ECFIN project, aimed to estimate the effect of ageing on public expenditures in the EU25 member states in the long-run (European Commission 2006). Although similar variables like in AHEAD project were used as assumptions, only the developments of expenditure side were prognosed. As real Estonian health expenditures according age groups were not available, average EU10 age profiles were used for Estonia.

Estonian Health Insurance Fund annually prepares four year budget prognosis for revenues and expenditures to plan its budget basing on annual Ministry of Finance economic prognosis.

2. Synthetic description of the ILO health budget model

Projections of health care financing are made using the actuarial model of International Labour Organization (ILO) (Cichon et al, 1999). The social budget model has been restricted to health care budget and further adjusted to the country health care system. The model covers both health expenditures and revenues.

The ILO model is a system of Excel files. The health budget module is linked with other files receiving input data from four different files: the population module (results of demographic projections), the labour force module, the economic-governmental module and the health care utilisation module (j-curve). The demographic module also serves as an input for the labour force module.

Demographic data, labour force and economical data need to be used as assumptions for projections. Number of population by single ages or 5-years age groups, total fertility rate and life expectancy in base year is used as imput for demographic projections. Labour force participation rate, number of employment and proportion of those contributing to health insurance is used as labour force input. Economic factors (labour productivity, GDP growth, real wages growth, inflation) are used to project health care expenditures.

3. Data sources for the ILO health budget model

For the health budget model mainly official statistics or data provided by governmental or public institutions was used. Assumptions were made using national past trends and/or international experiences. Base year for prognosis was 2003, target year 2050.

3.1 Sources for demographic data

Main data source for demographic data (population by single age and sex, total fertility rate, life expectancy) was Statistics Estonia (SE). Demographic statistics is registered and published on continuous basis. There is no data collection for migration established in Estonia, for prognosis assumption of 0-migration was used. For population prognosis assumptions from the prognosis of Statistics Estonia (2002) “Possible population and age distribution in Estonia, 2004–2050” and United Nations population prognosis to the year 2050 (2004, 2006) was used.

3.2 Sources for labour market and economic data

Main data source for labour market (participation in labour force, unemployment rate) and economic (GDP, GDP growth, labour productivity, real wages) data was Statistics Estonia. Labour market data bases on Labour Force Survey.

As Estonian economy is currently growing very fast for the years 2003–2006 real labour market and macroeconomic statistical data was used. As assumptions for projections to the year 2011 projected data as described in official "Economic prognosis – 2007 Summer" by Ministry of Finance of Estonia was used.

3.3 Sources of data on health care system

Health care utilisation and health care expenditure data were obtained from the official health statistics produced by Ministry of Social Affairs of Estonia (2005, 2007). Ministry of Social Affairs of Estonia collects aggregated health statistics data from all public and private health care providers. Data for health services utilisation patterns (hospital and outpatient care) by 5-year age-groups were estimated basing on Ministry's of Social Affairs statistics and Estonian Health Insurance database. Those utilisation patterns were used for calculations per capita expenditures for each age-group. Estonian Health Accounts data is produced also by Ministry of Social Affairs of Estonia using common OECD/WHO/Eurostat System of Health Accounts (SHA) methodology. Distribution of health care expenditures by financing source, provider and health care function bases on SHA (2004, 2007). Distribution of hospital and ambulatory expenditures to staff and non-staff costs is basing on Economic activity reports of health care providers reported to the Ministry of Social Affairs (2004, 2007).

4. Variables and assumption on variables development

The base year for the projections was 2003, target year was 2050. According to the structure of the model the base year data and assumptions for development of main demographic, labour market and economic projections would be discussed.

4.1 Demographic projections

Total Fertility Rate (TFR)

According to the official national statistics TFR for the base year 2003 was 1.37. Target TFR for the year 2050 was assumed 1.85 which corresponds to the medium variant of UN 2004 population prognosis. From the original ILO model the Northern Europe fertility pattern was chosen as Estonian women tend to have children in later years and the average age of women giving birth is continuously increasing. Linear decrease scenario of TFR was assumed. The projected TFR remains below the population replacement level (2.1), which leads to the decrease of the population.

Life expectancy at birth (LE)

LE at birth for the base year (2003) used as input to the ILO model was for males 66.0 and for females 76.9 years. From the ILO model scenarios of the middle LE improvement scenario was chosen.

Table 1. Demographic projections for the years 2003–2050, Estonia

	2003 (base year)	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
TFR	1.37	1.39	1.44	1.50	1.55	1.60	1.65	1.70	1.76	1.81	1.85
LE-males	66.0	66.6	68.0	69.2	70.4	71.5	72.5	73.5	74.3	75.1	75.7
LE-females	76.9	77.3	78.2	79.0	79.8	80.5	81.0	81.5	82.0	82.5	83.0
Old age dependency ratio*	23.7%	24.2%	24.4%	26.2%	28.7%	31.7%	34.2%	35.9%	38.7%	41.8%	47.0%
Dependency ratio**	47.7%	46.5%	45.7%	48.9%	52.0%	54.3%	55.7%	57.1%	60.7%	65.3%	71.9%

* Proportion of elderly (65+) to working age population (15–64)

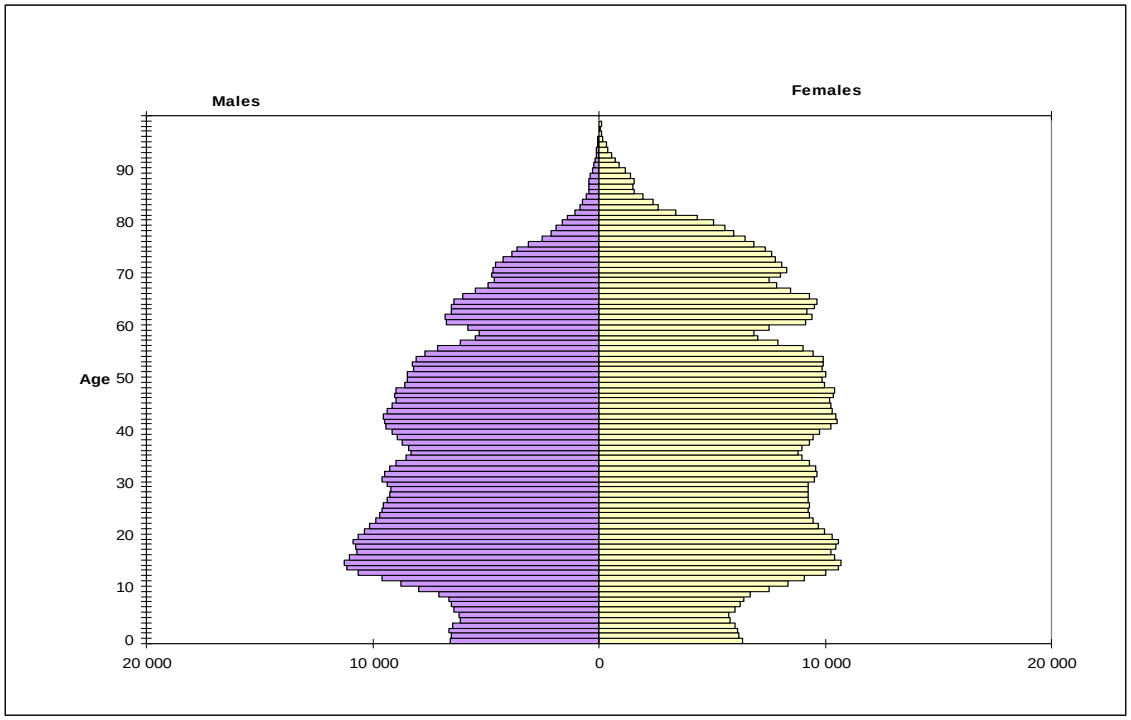
** Proportion of children (<15) and elderly to working age population

Source: Own calculation based on SE data and ILO model.

Table 1 presents development of demographic variables for the base year and for the prognosis period basing to the assumptions described above. Life expectancy is going to increase almost 10 years for males and 6 years for females during the period 2003–2050 and more than 10 years gap in life expectancy between males and females would diminish to 7.3 years. These values correspond well with the national and UN population prognoses for males for the year 2050 and are somewhat higher for females (SE prognosis for females to the year 2050 is 82.0 years and medium variant of UN 2006 prognosis is 82.4 years).

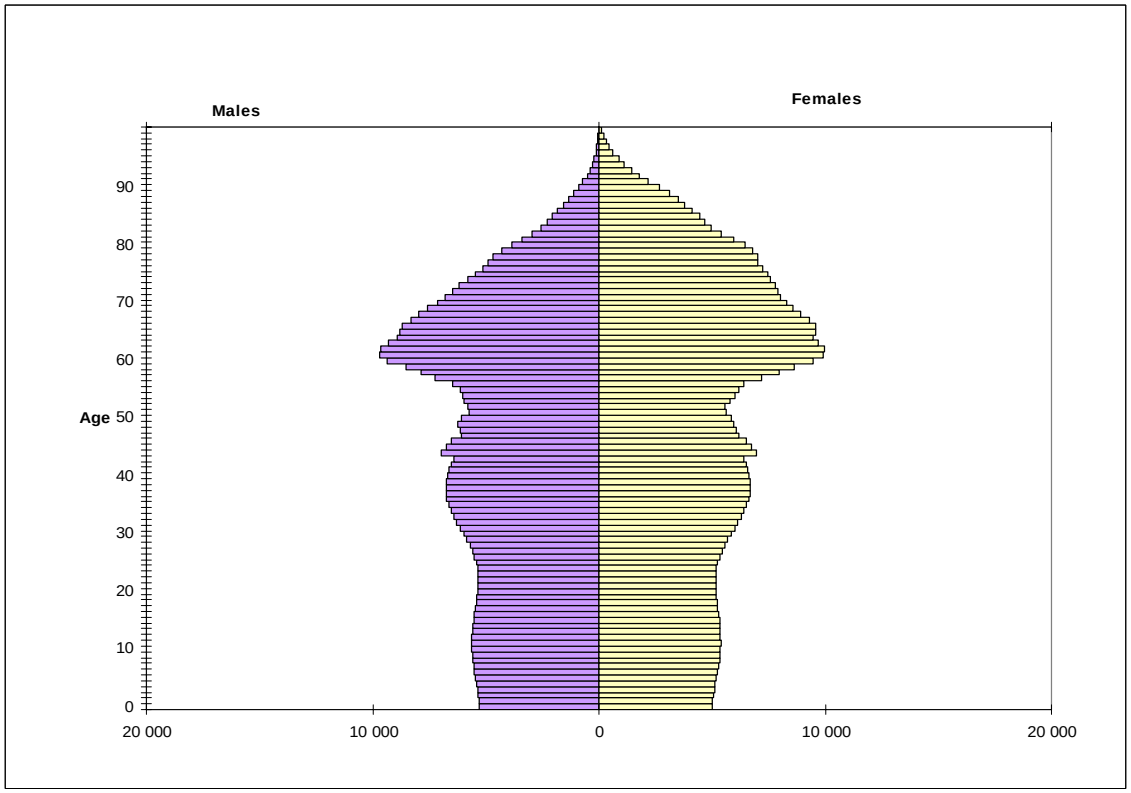
Although the life expectancy is growing, the size of the population would still decline due to the fertility under replacement level. The population is ageing. Proportion of children (0–14) would decline from 16.3% to14.5% but share of elderly population (65+) would rise from 16.0% to 27.3% during the projected period. At the same time the proportion of people in age 15–64 would decline from 67.7% to 58.2% (Figures 1–3). The population in working age would decline from 932 thousand to 664 thousand and elderly population would increase from 201 thousand to 285 thousand. The old age dependency ratio doubles: from 23.7 to 47.0%, which means that in base year we have 4.6 working age persons for every elderly person but in 2050 it would decline to 2.3.

Figure 1. Estonian population pyramid, 2003



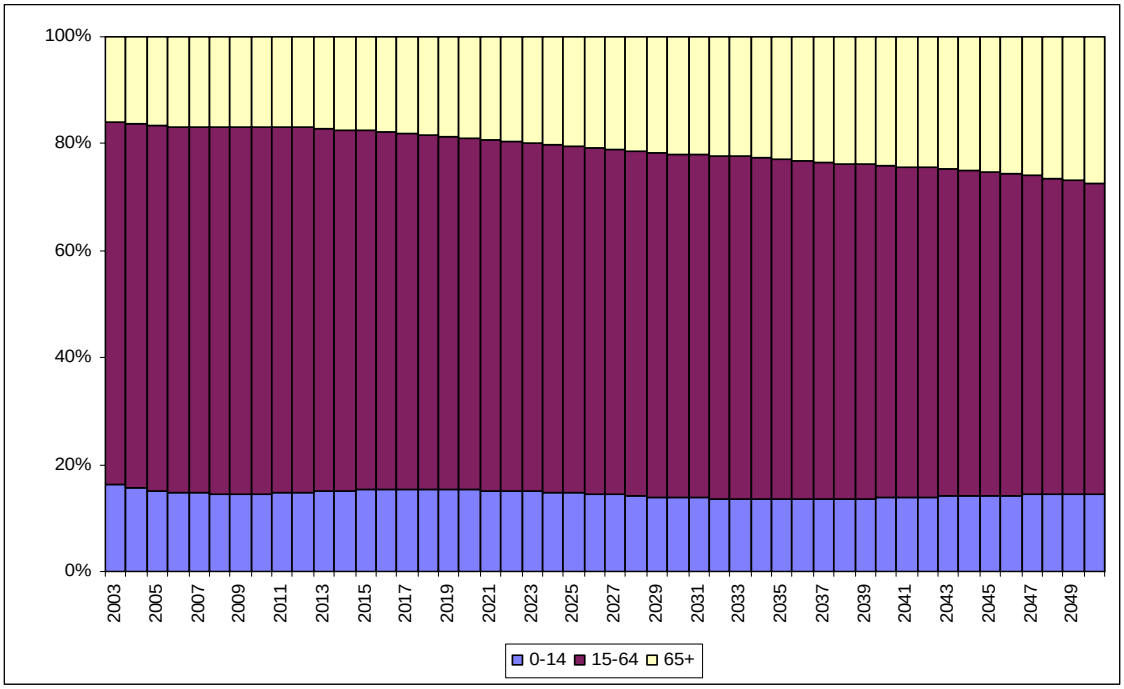
Source: Own calculation based on SE data and ILO model.

Figure 2. Estonian population pyramid, 2050



Source: Own calculation based on ILO model.

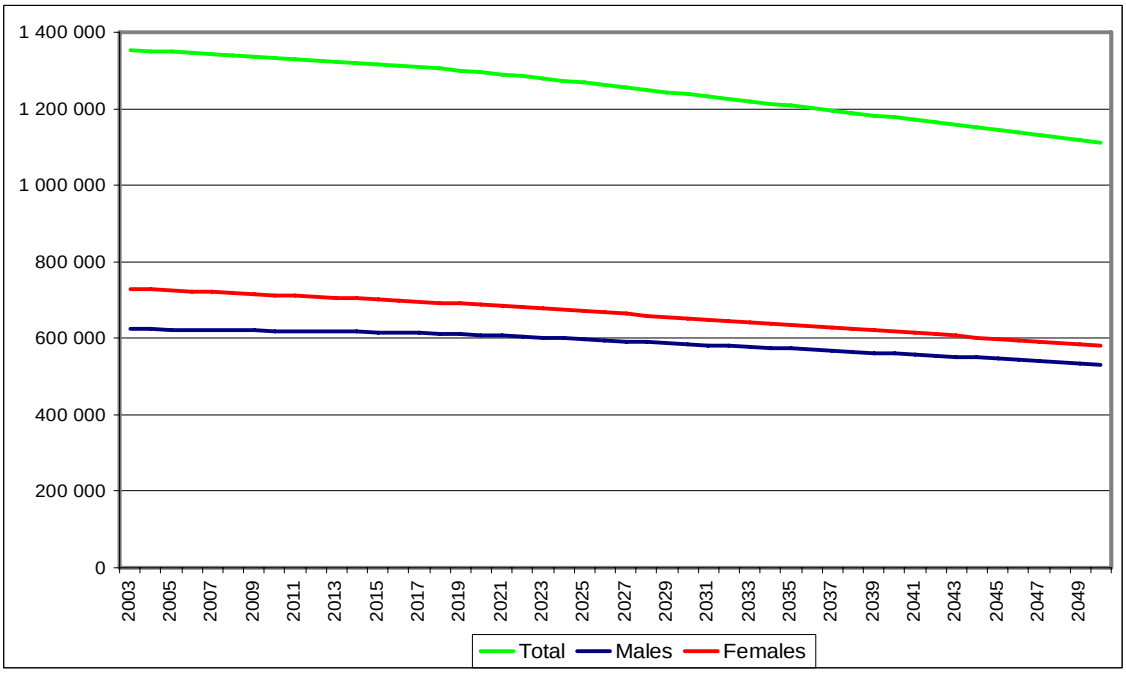
Figure 3. Projected age structure of the Estonian population, 2003–2050



Source: Own calculation based on SE data and ILO model.

Total population will permanently decrease during the projected period (Figure 4). The decline is slower until the year 2015 and then it accelerates. By the end of the period (2050) the number of population would be 1.11 millions, which is 18% less than in the base year (2003). The decline of female population (21%) is bigger as compared to males (15%). The projected size of population is similar to the UN 2006, EPC and European Commission prognoses.

Figure 4. Projected population size, 2003–2050



Source: Own calculation based on SE data and ILO model.

4.2 Labour market and economic projections

As Estonian economy is currently growing very fast for the years 2003–2006 real labour market and macroeconomic statistical data was used. As assumptions for projections to the year 2011 projected data as described in official "Economic prognosis – 2007 Summer" by the Ministry of Finance of Estonia (MoF) was used. For the following years moderately slower growth scenario was used caused by convergence effect of European Union economy, although Estonian growth rate remains higher than European Union average and new member states average.

Development of labour force variables used for projections is presented in Table 2 and developments of economic projections in Table 3.

Labour force participation rate and employment rate

Labour Force Survey data in 5 year sex and age groups of year 2003 was used as an input. Labour force participation rate (as % of economically active population in age 15–74) in base year was 63.0% (69.0% for males and 57.8% for females). Estonian labour force participation rate is higher than EU average. According assumed slight increase of active population in each age group (but somewhat higher increase in younger age groups approaching EU ones and higher increase in female older age groups due to established increase of retirement age to 63 for the year 2016) the labour force participation rate would increase to 66.8% for the year 2050 but the real labour force would increase up to year 2013 and starts then decline due to decreasing and ageing population resulting in year 2050 with 19% decrease of labour force as compared to the base year. The results are in line with EPC and European Union projections where for Estonia in mid-term an increase in labour supply with further decrease was projected.

Employment rate (aged 15–74) in base year was 56.7% (61.9% for males and 52.1 for females); employment rate in age groups 15–64 like in Lisbon Strategy was 62.7% (66.8% in males, 59.0 in females and 50.8% in elderly (55–64)). The overall employment rate is increasing to the year 2018 achieving 65.9% and decreases then to 63.2% in year 2050 due to decreasing labour force. Employment rate in age groups 15–64 would reach the 70% Lisbon employment rate target in 2012. Estonia has already achieved the Lisbon objectives regarding women (by 2005) and older workers. The main reason behind the positive developments in the labour market has been and would be the rapid economic growth. Assumptions are in line with the governmental "Action plan for growth and jobs 2005–2007 for implementation of the Lisbon Strategy" and somewhat higher than those used by EPC and European Commission.

Unemployment rate

Unemployment rate was in base year 10.0%. Unemployment trend has been favourable in 2004–2006, unemployment rate decreased to 5.9% in 2006 achieving the lowest level in last years and the tendency to decrease continues. Employment rate of senior citizens has significantly increased – a large amount of retired persons and discouraged workers, who had lost hope finding a job, became active on the labour market. It was assumed that the decrease of unemployment rate would continue until to 5.3% and then remains constant for the whole prognosis period. This prognosis is more optimistic than those used by EPC and European Commission for Estonia (7.0% was assumed to be constant level after 2015) and prognosis for EU25 average (6.1% for 2050).

Table 2. Labour market projections for the years 2003–2050, Estonia

	2003 (base year)	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Labour force part rate	63.0%	63.7%	66.7%	69.0%	68.9%	68.9%	68.7%	68.8%	68.7%	67.8%	66.8%
Empl growth	1.5%	2.0%	0.0%	0.0%	-0.5%	-0.5%	-0.6%	-0.7%	-0.9%	-1.1%	-1.2%
Empl rate	56.7%	57.7%	63.1%	65.1%	65.4%	65.2%	65.1%	65.1%	65.0%	64.2%	63.2%
Unempl rate	10.0%	9.4%	5.5%	5.7%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%

Source: Own calculation based on SE data and MoF prognosis.

Labour productivity

Labour productivity growth in the base year (2003) was 5.6%. For the years 2004–2006 real labour productivity growth figures were used and until 2011 those as in official MoF prognosis. Further it was assumed that Estonian labour productivity growth slows down showing convergence trend closer to EU average, reaching 3.3% in 2050, but remaining still over EU average (1.7% according EPC and European Commission prognosis) and higher than prognosed by EPC and European Commission for Estonia (1.8%).

Real wages

In 2003, real wages grew by 8.3%, and an even sharper rise until 10.9% followed in 2004–2006. Competition with Finnish, Swedish and other European labour markets and their wage levels has equally put pressure on wage increase. So, the real wages grow faster than labour productivity in 2003 and 2006. For prognosis the 2004–2006 real wages growth figures were used, for 2007–2011 those as in official MoF prognosis. The wage level harmonisation process will inevitably take place due to several labour markets opening up for the citizens of new EU member states. According MoF prognosis real wages would increase faster than labour productivity for couple of years but then it changes and labour productivity starts drive the real wage growth. For the modelling further growth in real wages is assumed to be same as in labour productivity since 2012.

GDP

Estonia is currently having very rapid economic growth. Real GDP growth in base year (2003) was 7.1% and constantly growing it reached up to 11.4% in 2006. This can be explained by favourable economic developments resulting from strong domestic market demand and increased export, although those both growth tempos are expected to be slower since 2007. Like by other labour force and economic variables assumptions used in modelling, real GDP growth rates for years 2003–2006, and for 2007–2012 figures from official MoF prognosis were used. Since 2012 further GDP growth rate was assumed to be driven by labour productivity growth (due to the progress of technology) having the same growth tempo. As a result of abovementioned unfavourable demographic developments, employment trends and the agreed assumptions on productivity, potential GDP growth is projected to decline and falls to 3.3% in 2050.

Table 3. Economic projections for the years 2003–2050, Estonia

	2003 (base year)	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Labour productivity growth	5.6%	8.3%	7.2%	4.3%	4.1%	4.1%	3.9%	3.8%	3.6%	3.4%	3.3%
Real wage growth	8.3%	6.4%	7.0%	4.3%	4.1%	4.1%	3.9%	3.8%	3.6%	3.4%	3.3%
Real GDP growth rate	7.1%	10.5%	7.2%	4.3%	4.1%	4.1%	3.9%	3.8%	3.6%	3.4%	3.3%
Nominal GDP growth rate	9.5%	18.0%	11.2%	6.4%	6.2%	6.2%	6.0%	5.8%	5.7%	5.4%	5.4%

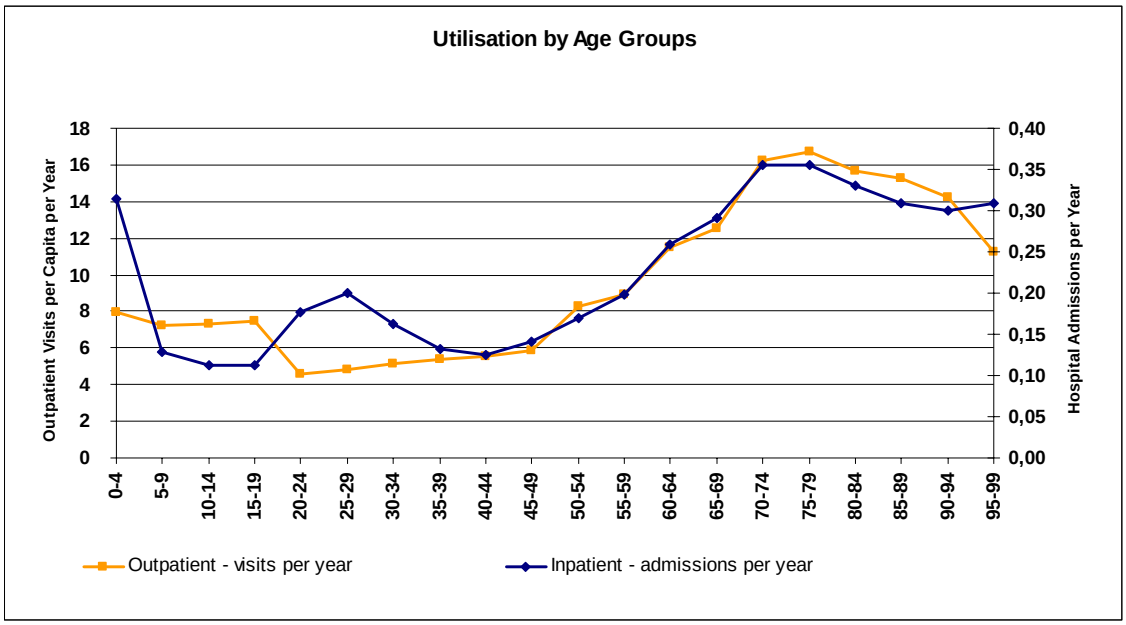
Source: Own calculation based on SE data and MoF prognosis.

4.3 Health care

Health care utilisation

There was altogether 10 935 411 outpatient contacts or visits, and 2 123 987 hospital days performed in Estonia during the base year 2003 according to statistics published by MoSA. Average length of stay was 8.2 days. Basing on MoSA and EHIF data the in-and outpatient utilisation patterns for 5-year age groups in base year was found (Figure 5). Utilisation patterns follow so-called j-curve form. Hospital utilisation is high in 0-4 age group, then it declines considerably (forming a specific small increase due to giving birth in reproductive age of females), and starts to increase in fifties, reaching maximum in age 70–79 and declines afterwards in later age groups. Outpatient care utilisation is quite stable (7-8 contacts per year) during childhood and adolescence, declines when one is in twenties and starts to increase in fifties, reaching maximum in seventies. Decline in outpatient use starting age 80 is deeper than in hospital utilisation. So, very elderly persons (80+) do not consume health care so much as those in seventies.

Figure 5. Health care utilisation by age groups, 2003



Source: Own calculations basing on MoSA and EHIF data.

In- and outpatient health costs in 5-year age-groups in base year were estimated basing age-specific utilisation rates and respective health care expenditures using overall health expenditures data (SHA). The utilisation pattern in each age group is assumed to be constant and 1% yearly increase of hospital and outpatient care utilization was used as assumption for the whole prognosis period. So, projections would not take into account possible changes in the health care status of the population over time.

Health expenditures

Public health expenditures, including governmental and insurance expenditures, in base year are basing the Estonian Health Accounts for 2003 (MoSA, 2004, 2007). Expenditure on health in Estonia is calculated using the OECD method. The total health care expenses enable to measure economic resources spent on health care services and products, in addition also to preventive activities. This sum includes also administration and capital expenditure; it does not include sickness benefits and the expenses on training medical staff. Expenses related to health but provided outside the health care sector (e.g. fabrication, education of health care professionals) are not included in the total expenditure on health. Additionally, individual activities for maintenance or improvement of health (e.g. sporting activities) are not included in the total expenditure. The labour costs of health care professionals are included in the costs of services.

The total expenditure on health in 2003 was 6.76 billion EEK (Table 4), which amounted to 5.1%[1] of GDP. This makes approximately 5037 EEK (323 EUR) for health expenditure per capita. The sources of financing health care system divide into three: general government, private sector and rest of the world (i.e. foreign sources). General government is the largest financier of health care in Estonia. The expenditure incurred by the general government was 5.19 billion EEK. Public sector health care expenditures amounted 4.2% of GDP in 2003. 86% of public health expenditures are financed by Estonian Health Insurance Fund (EHIF).

Health insurance

At the end of 2003, the EHIF covered 94 % of the population (1 272 051 people). Entitlement to EHIF coverage is based on residence in Estonia and membership of specific groups defined by law. There is no possibility of opting out. The only group excluded from coverage is the prison population, whose health care is organised and paid for by the Ministry of Justice. Since the end of 2002, some groups who were not previously covered have been able to obtain coverage on a voluntary basis.

Those covered by the EHIF fall into four main categories: those who make their own contributions, those who are covered by contributions from the state, those who are eligible for coverage without contributing and those who are covered on the basis of bilateral international agreements.

Employees and self-employed people make contributions to the EHIF via an earmarked payroll tax. This tax is known as the social tax and covers both health and pension contributions (respectively equal to 13% and 20% of wages). In practice, employers actually make contributions on behalf of employees, so employees do not contribute directly for health insurance.

[1] There was 5.3% before recalculations of GDP (due to harmonisation of GDP calculation methodology to EU one's) done by SE in 2006

Table 4. Health care expenditures by provider and sources of financing, 2003

	General Government		Private Sector			Non-Profit institutions (other than social insurance)	Cor-porations	rest of the world	**Sub-Total**
	General Government (excl. Social security)	Social Security Funds	Private Social Insurance schemes	other private insurance schemes	Private out-of pocket payments				
	in mio. of EEK (current prices)								
Hospitals	103,9	2 783,1			86,1				**2 973,0**
Nursing and Residential care Facilities	59,2	6,0			13,0				**78,1**
Providers of ambulatory health care	225,6	815,9			448,3		19,8		**1 509,7**
Retail Sale and other providers of medical goods	113,8	704,1			832,3		162,5		**1 812,7**
Provision and administration of public health	55,3	59,3				0,1	0,7	3,8	**119,2**
General health administration and insurance	178,3	86,6							**264,9**
Governmental administration of health	178,3								**178,3**
Social Security Funds		86,6							**86,6**
other social Insurance									
Other industries (rest of the economy)	0,2								**0,2**
Occupational health care services									
Private household as providers of home care									
All other secondary producers of health care									
Rest of the world		1,3							**1,3**
Unclassified									
Total current Expenditure on health care	**736,3**	**4 456,3**			**1 379,7**	**0,1**	**183,0**	**3,8**	**6 759,2**
Gross Capital Formation	*52,7*							*0,3*	***53,0***

Source: MoSA.

Specific groups are covered by contributions from the state budget, such as individuals on parental leave with small children, those who have been registered unemployed for a period of nine months and those caring for disabled people. Other groups, including children, pensioners, disabled people receiving a disability pension and students, are eligible for coverage without any contribution either from themselves or the state. Since the end of 2002, voluntary EHIF coverage has been extended to those who might otherwise remain uninsured. Eligibility for voluntary coverage is restricted to Estonian residents who receive a pension from abroad (usually because they worked abroad and have returned to Estonia on retirement) or people who are not currently eligible for membership but who have been members for at least 12 months prior to applying for voluntary membership. This might include students studying beyond what is considered to be the normal length of study and people temporarily out of work but not registered as unemployed. Voluntary members (212 people in 2003) are entitled to exactly the same benefits as compulsory members. The minimum contract is for one year and coverage begins a month after the contract has been signed. Voluntary members pay a contribution of 13 % of the national average salary of the previous year. The structure of insured people is given in the Table 5.

In the present situation, 49.7% of the individuals covered by health insurance are directly taxed individuals and 49.6% are people who are equal to the insured under the solidarity principle, for which social taxes are not paid. Number of non-contributing insured would rise as population ages, which threatens the long-term sustainability of health insurance.

Social tax comprises almost 99% of the total revenue basis of the Health Insurance Fund. In four last years the increase of the social tax inflow has exceeded 10%. During the last 10 years the health insurance revenue has grown 6-fold. The increase of revenue has been caused by the rise in real wages and consumer price index, and also by the improvement of the economic environment and more effective tax collection.

Table 5. EHIF entitlement criteria and % of insured in entitlement groups, 2003

Group	Basis of entitlement and contribution requirement	% of insured
Insured covered by employer or their own contributions	employers or individuals contribute	45.90
Employees	employers pay 13% of wages	44.30
Self-employed	self-employed pay 13% of earnings	1.60
Insured covered by state contributions	the state contributes	3.80
Persons on parental leave with a child under 3 years, one non-working parent of children under 8 years and one parent in a family with three children under 19 years	13% on an amount[2] defined each year	1.70
Registered unemployed	13% on an amount defined each year (entitlement for 270 days)	1.20
Carers of disabled people	state pays 13% on an amount defined each year	0.75
Men participating in compulsory military service	state pays 13% on an amount defined each year	0.16
Persons exposed to nuclear contamination (mainly related to the Tshernobyl catastrophe)	state pays 13% on an amount defined each year	0.03

[2] State contributes monthly 13% on 700EEK per each insured by state.

Non-contributing insured	no contributions	49.60
Children up to 19 years	residence	23.90
Pensioners	residence and entitlement to the state pension	19.70
Disabled people entitled to special pensions	residence and entitlement to the disabled persons pension	2.90
Students	education (no contributions from those under 24 years or within the 'normal anticipated length of study')	2.80
Non-working spouses of insured	before 2003: all since 2003: those 5 years from pensionable age	0.06
Non-working pregnant women from the 12th week of pregnancy	residence	0.05
Insured based on bilateral international agreements		0.49
Russian retired military personnel	contributions paid by the Russian Federation based on the average costs of the insured in their respective age group	0.30
Other agreements	no contributions paid; costs reimbursed or waived	0.19

Source: Jesse et al. (2004).

According to Estonian Health Insurance Fund Act EHIF has to form the legal reserve of Health Insurance Fund for the reduction of the risk which macro-economic changes may cause to the health insurance system. The legal reserve shall amount to 8%[3] of the budget. Each year, at least one-fiftieth of the total budget of the Health Insurance Fund and revenue from the social tax revenue prescribed for the payment of health insurance benefits which is higher than prescribed in the state budget shall be transferred to the legal reserve, until the amount of the legal reserve provided by this Act is reached or restored. The legal reserve may only be used as an exception by an order of the Government of the Republic on the proposal of the Minister of Social Affairs. As of 31 December 2003 the amount of the Health Insurance Fund legal reserve was 415.4 million EEK. The risk reserve of the Health Insurance Fund is the reserve formed from the budgetary funds of the Health Insurance Fund in order to minimise the risks arising for the health insurance system from the obligations assumed. The size of the risk reserve shall be 2% of the health insurance budget of the Health Insurance Fund. The funds of the risk reserve may be used upon a decision of the Supervisory Board of the Health Insurance Fund. As of 31 December 2003 the amount of the Estonian Health Insurance Risk reserve was 142.8 million EEK. The longer-term legal reserve investments are subject to explicit rules and are made with the view of minimising the risks arising from macroeconomic changes.

EHIF main responsibilities include: paying for health services, reimbursing pharmaceutical expenditure, and paying for some sick leave and maternity benefits. As sick leave and maternity benefits is not considered as part of health expenditures according SHA methodology, the current and prognosed costs of cash benefits are deducted both from revenue and expenditure side of prognosis. Cash benefits formed 16.2% of total EHIF expenditures in 2003. This cost was projected to increase in line with real wages and employment growth.

[3] 6% starting 01.01.2005

Expenditures on pharmaceuticals are assumed to grow in line with outpatient costs, as pharmaceuticals expenditures are fixed with a certain share of health insurance expenditures according to Health Insurance Act.

State pays for ambulance, emergency medical care provided to uninsured persons, prisoners health care, public health and health care administration. It is assumed to continue during the whole prognoses period in line with EHIF expenditures growth as real governmental expenditures depend on concrete annual political debates and decisions, which are difficult to predict.

During the whole projection period, increase of expenditure level is driven by GDP per capita growth, which is the most important non-demographic driver of health expenditures. So, individual health expenditures at single ages grow with the same rate as GDP per capita.

4.4 Policy assumptions

During projected period only policy changes, which are guaranteed by currently adopted regulations, were used.

Two important policy changes are considered: increase of minimum social tax liabilities (tax basis for those the state contributes) and enlargement of health insurance coverage to long-term unemployed.

In order to find supplemental resources to finance state pension insurance and health insurance the government decided that the minimum social tax liabilities (tax basis for those state contributes) must be completed from the minimum monthly wage. So, in 2006, the minimum commitment was increased to 1,400 EEK[4] per month, in 2007 to 2,000 EEK. The monthly minimum wage should become the tax basis in 2009 continuing step-by-step increase of tax basis. So, this decision has a positive impact on revenue side of health insurance budget.

The second political decision influences both revenue and expenditure side. Since 2007 all the unemployed registered in the Labour Market Board are provided with health insurance. Guaranteeing health insurance for all registered unemployed people (including those whose period of receiving unemployment benefits has ended[5]) enhances motivation of the long-term unemployed people to register as unemployed. Registering enables to involve long-term unemployed people in active labour market measures.

Although health care spending is to a large extent determined by the policy decisions of the government, currently studying impact of ageing on the health care system performance, no other policy change in health care sector or in health insurance is assumed.

5. Results of projections and sensitivity analysis

Results of the projections are presented as baseline scenario. Projections have been performed also for faster and slower improvement in life expectancy and for higher and lower employment growth as alternative assumptions to analyse sensitivity of projections. Results of baseline scenario and sensitivity analyses are presented below.

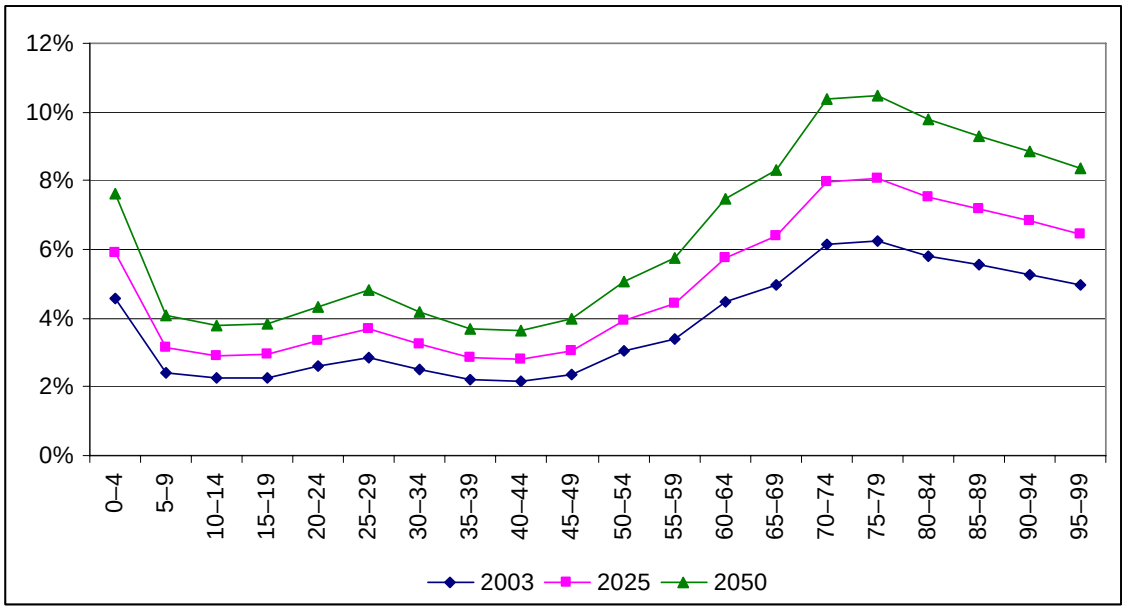
[4] It was 700 EEK per month during all previous years

[5] Previously only those receiving unemployment benefits (max 270 days) were insured

5.1 Baseline scenario

Health insurance expenditures per capita follow health care utilization pattern (see Figure 5) depending on persons age – it is high in age group 0-4 (mainly due to cost occurring in the first year of life), then it is low until one reaches fifties and the maximum is in seventies. During the projected period overall increase of expenditures is foreseen due to assumed expenditure growth in line with GDP per capita increase, but the increase is considerably higher in older age groups (Figure 6).

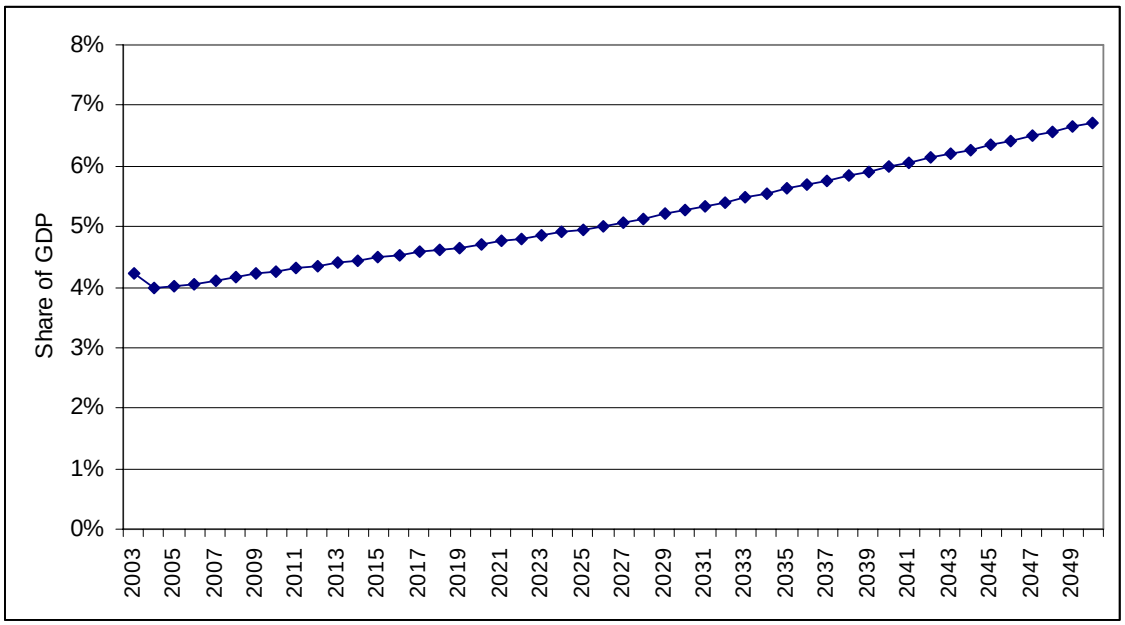
Figure 6. Average per capita health insurance expenditures as percent of GDP per capita by age groups, 2003, 2025, 2050



Source: Own calculations basing on MoSA and EHIF data and projections.

Results of the baseline scenario are presented in Figures 7–10 and Table 6. Total public health expenditures formed 4.2% of GDP in base year (2003). After a small decline in 2004–2005 continuous slow increase by 59% of public expenditures as share of GDP is projected. Total increase would be 2.5% of GDP. The increase is steeper in the second half of prognosis period: from 5.0% of GDP in 2025 to 6.7% of GDP in 2050 (Figure 7). The projections for public spending on health care for 2050 are similar to European Commission projections (6.5% of GDP), although EC prognosed steepest increase between years 2004 to 2025. For EU projections national age-related expenditure profiles were not available and thus average EU10 profiles were used for Estonia.

Figure 7. Total public expenditure as percent of GDP, 2003-2050

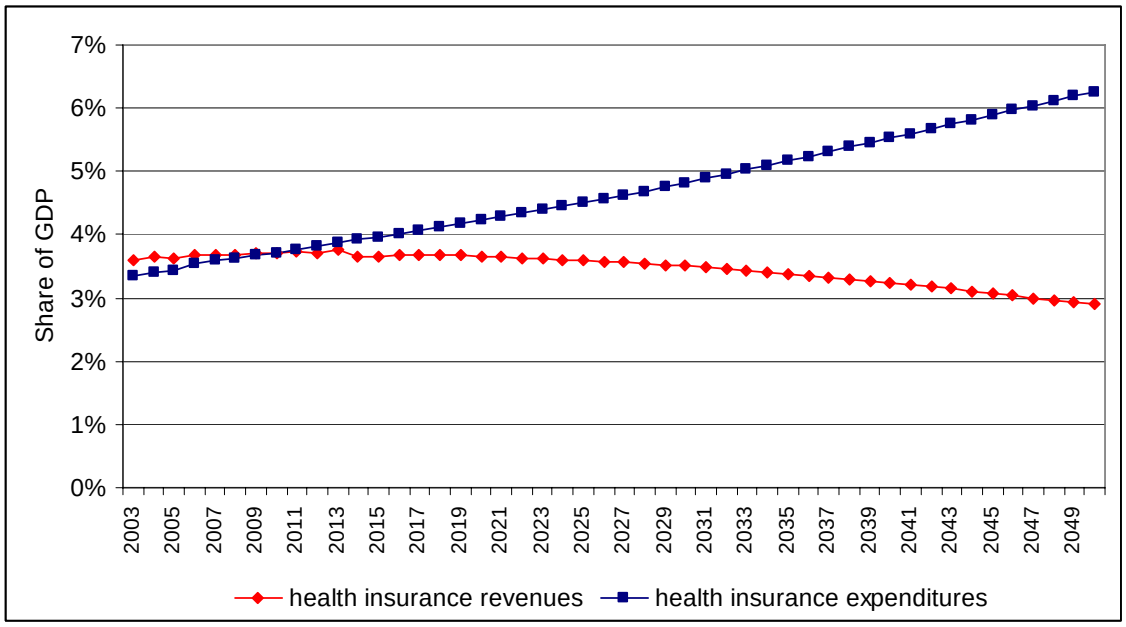


Source: Own calculations.

Health insurance expenditures formed 3.4% of GDP in base 2003. At the same time the health insurance revenues made 3.6% of GDP. Excess of revenues was deposited to EHIF reserves. The model predicts steady 87% increase of health insurance expenditures as share of GDP from 2003 to 2050, what corresponds to 2.9% of GDP (Figure 8). The level of expenditures would be 4.5% of GDP in 2025 and 6.3% of GDP in 2050. Also by health insurance expenditures the increase is steeper in the second part of prognosis period. The increase is mainly caused by demographic trends as older age groups, who consume more health care services, become more prevalent.

Health insurance revenues would rise to 3.7% of GDP and remain to this level until 2020. After that slow decrease starts reaching 3.5% in 2030 and then steeper decrease would be expected resulting with health insurance revenues forming 2.9% of GDP by 2050 (Figure 8). The rising and constant level of revenues in the first half of prognosis period is foreseen due to positive developments in employment caused by large cohorts born in eighties entering labour market and rise of retirement age of females to age 63 by 2016. The dramatic fall of revenues in the second part of projected period is caused by demographic processes as share of non-contributing insured persons rises quickly.

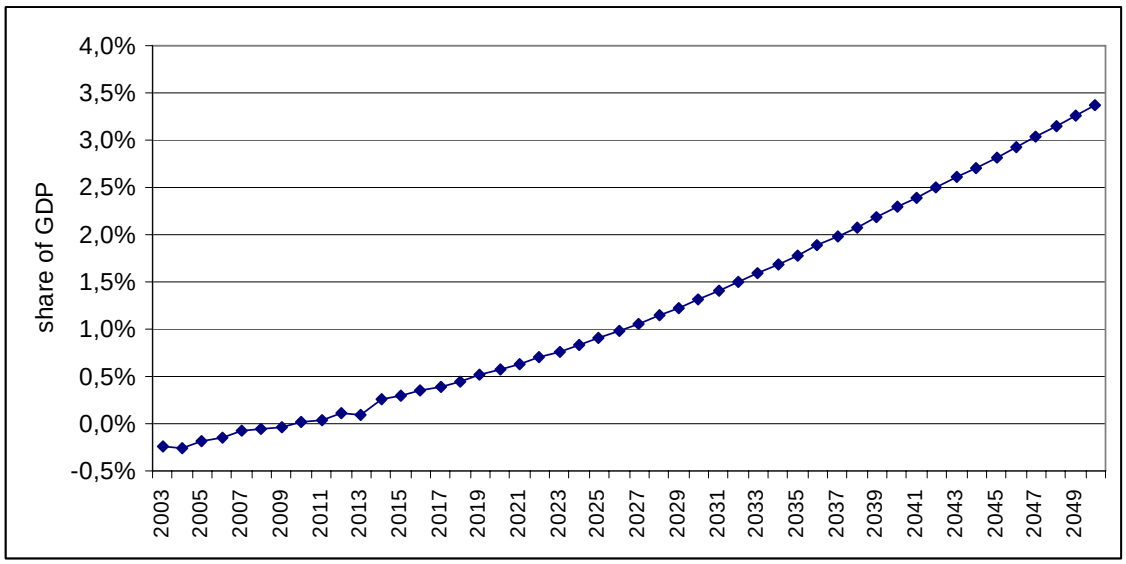
Figure 8. Projected health insurance revenues and expenditures as percent of GDP, 2003-2050



Source: Own calculations.

Due to difference in health insurance expenditure and revenue sides the deficit of Estonian health insurance system is expected. Starting 2011 the health insurance reserves would be used, by 2015 the reserves are run down. Further the deficit would steadily grow reaching 3.4% of GDP by 2050 (Figure 9). This means that the deficit would be more than half of the expenditure. The main reason for such deficit is ageing as share of non-contributing insured exceeds largely share of those who are contributing.

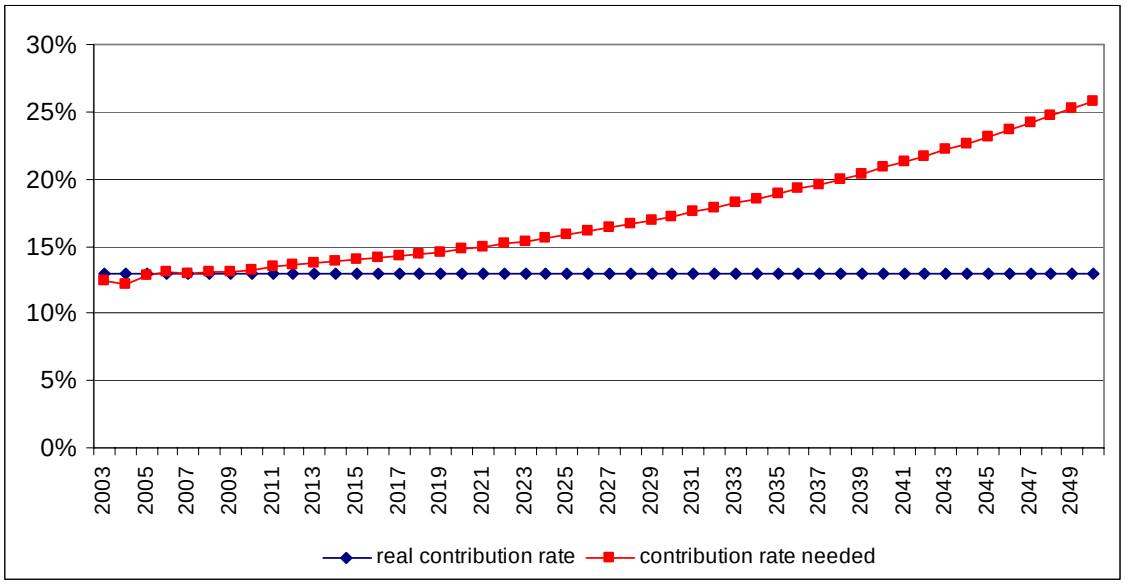
Figure 9. Projected deficit of insurance health care system as percent of GDP, 2003-2050



Source: Own calculations.

The health insurance contributions rate is 13% of gross wages since establishment of health insurance in Estonia in 1992. To overcome projected health insurance deficit and keeping the base of contributions constant, the increase of health insurance contribution rate up to 25.8% by the year 2050 would be needed (Figure 10).

Figure 10. Health insurance real and needed contribution rate to cover expenditures, 2003-2050



Source: Own calculations.

Table 6. Results of the baseline scenario – total public health and health insurance expenditures, 2003-2050

	2003	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Total public expenditure (% of GDP)	4.2%	4.0%	4.3%	4.5%	4.7%	5.0%	5.3%	5.6%	6.0%	6.3%	6.7%
Health insurance expenditure (% of GDP)	3.4%	3.4%	3.7%	4.0%	4.2%	4.5%	4.8%	5.2%	5.5%	5.9%	6.3%
Health insurance revenues (% of GDP)	3.6%	3.6%	3.7%	3.7%	3.7%	3.6%	3.5%	3.4%	3.2%	3.1%	2.9%
Health insurance deficit (% of GDP)	0.2%	0.2%	0.0%	-0.3%	-0.6%	-0.9%	-1.3%	-1.8%	-2.3%	-2.8%	-3.4%
Contribution rate needed to cover health insurance expenditures	12.4%	12.9%	13.2%	14.0%	14.8%	15.8%	17.2%	18.9%	20.8%	23.1%	25.8%

Source: Own calculations.

5.2 Sensitivity testing

Using alternative assumptions basic sensitivity tests for the baseline scenario projections were performed. To test the sensitivity of expenditure side of the projections the different scenarios on life expectancy (for faster and slower life expectancy improvement) were performed and to test the revenue side higher and lower employment rate as alternative assumptions were used.

5.2.1 Faster and slower improvement of life expectancy

Middle increase of life expectancy from ILO model scenarios was used as main assumptions in the baseline scenario. Fast and slow improvement of life expectancy from ILO model scenarios were used as assumptions for testing.

Faster improvement scenario of life expectancy predicts that life expectancy is going to increase more than 11 years for males and more than 7 years for females during the period 2003–2050. Males LE would be 77.4 years (compared to 75.7 in the middle LE improvement scenario) and females LE would be 84.2 years (compared to 83.0 in the middle LE improvement scenario) by the year 2050. The share of elderly would rise to 28.3% by 2050 and dependency ratio would be 74.2% (2.4% higher than in baseline scenario).

Slower improvement scenario of life expectancy predicts that life expectancy is going to increase 8 years for males and 4 years for females during the period 2003-2050. Males LE would be 74.1 years (compared to 75.7 in the middle LE improvement scenario) and females LE would be 81.2 years (compared to 83.0 in the middle LE improvement scenario) by the year 2050. The share of elderly would rise to 26.4% by 2050 and dependency ratio would be 69.7% (2.2% less than in baseline scenario).

Faster increase in LE causes the increase both in total public health expenditures and in health insurance expenditures by 0.05% of GDP and slower increase in LE reduces total public health expenditures by 0.04% of GDP and health insurance expenditures by 0.06 % of GDP by the year 2050 as compared to baseline scenario (Table 7). So, the effect on costs is small.

Table 7. Summary of results – different life expenditure improvement scenarios, 2003, 2025, 2050

	LE – fast improvement			**LE – middle improvement (baseline scenario)**			**LE – slow improvement**		
	2003	**2025**	**2050**	**2003**	**2025**	**2050**	**2003**	**2025**	**2050**
Total public expenditure (% of GDP)	4.22%	4.97%	6.76%	4.22%	4.96%	6.71%	4.22%	4.94%	6.67%
Health insurance expenditure (% of GDP)	3.35%	4.52%	6.32%	3.35%	4.50%	6.27%	3.35%	4.49%	6.21%
Health insurance revenues (% of GDP)	3.59%	3.61%	2.91%	3.59%	3.60%	2.90%	3.59%	3.59%	2.88%
Health insurance deficit (% of GDP)	0.24%	-0.91%	-3.40%	0.24%	-0.90%	-3.37%	0.24%	-0.90%	-3.33%
Contribution rate needed to cover health insurance expenditures	12.37%	15.83%	25.88%	12.37%	15.83%	25.82%	12.37%	15.81%	25.77%

Source: Own calculations.

Effect to health insurance revenue side by the year 2050 is even smaller (difference 0.01–0.02% of GDP) than on expenditure side (Table 7). The health insurance deficit would be 0.03% of GDP higher by faster improvement of LE as compared to baseline scenario and 0.04% of GDP lower by slower improvement of LE by the year 2050. The health insurance contribution rate needed to close the gap between health insurance expenditures and revenues would be 0.06% higher by faster improvement of LE and 0.05% less by slower improvement of LE as compared by baseline scenario in 2050.

5.2.2 Higher and lower employment growth

Optimistic higher employment growth was assumed due higher labour force participation rate. General 2% of increase in labour force participation rate was used with extra 5% increase in younger age groups due to possible targeted employment activities and an extra higher increase in older age groups due to possible increase of the retirement age until 65 as compared to baseline scenario as target for the 2050. According those assumptions labour force participation rate would achieve 73.3% (compared to 66.8% in baseline scenario) by the year 2050 and employment rate 69.4% (compared to 63.2% in baseline scenario).

Pessimistic slower employment growth was assumed as generally 2% lower increase of labour force participation rate in all age groups than in baseline scenario by the year 2050. According this assumptions labour force participation rate would attain 65.5% (compared to 66.8% in baseline scenario) for the year 2050 and employment rate 62.0% (compared to 63.2% in baseline scenario).

By optimistic scenario of employment health insurance expenditures would be higher by 0.04% of GDP in 2025 and by 0.02% of GDP in 2050. By the pessimistic scenario of employment health insurance expenditures would be less by 0.02% of GDP in 2025 and by 0.03% of GDP in 2050 (Table 8).

Effect to health insurance revenue side is more visible. By optimistic scenario health insurance revenues would be higher by 0.25% of GDP in 2025 and by 0.29% of GDP in 2050. By the pessimistic scenario health insurance expenditures would be lower by 0.07% of GDP in 2025 and by 0.06% of GDP in 2050 (Table 8).

Table 8. Summary of results – different employment growth scenarios, 2003, 2025, 2050

	Optimistic employment growth scenario			**Baseline scenario**			**Pessimistic employment growth scenario**		
	2003	**2025**	**2050**	**2003**	**2025**	**2050**	**2003**	**2025**	**2050**
Total public expenditure (% of GDP)	4.22%	4.94%	6.70%	4.22%	4.96%	6.71%	4.22%	4.97%	6.72%
Health insurance expenditure (% of GDP)	3.35%	4.54%	6.29%	3.35%	4.50%	6.27%	3.35%	4.48%	6.24%
Health insurance revenues (% of GDP)	3.59%	3.85%	3.19%	3.59%	3.60%	2.90%	3.59%	3.53%	2.84%
Health insurance deficit (% of GDP)	0.24%	-0.68%	-3.10%	0.24%	-0.90%	-3.37%	0.24%	-0.95%	-3.40%
Contribution rate needed to cover health insurance expenditures	12.37%	15.03%	23.76%	12.37%	15.83%	25.82%	12.37%	16.04%	26.02%

Source: Own calculations.

The health insurance deficit would be 0.22% of GDP less in 2025 and 0.27% of GDP less in 2050 by optimistic scenario of employment as compared to baseline scenario. The health insurance deficit would be higher by 0.05% of GDP in 2025 and by 0.03% of GDP in 2050 by pessimistic scenario of employment. The health insurance contribution rate needed to close the gap between health insurance expenditures and revenues would be 2.01% less by optimistic scenario of employment and 0.20% higher by pessimistic scenario of employment as compared to baseline scenario in 2050.

6. Conclusions

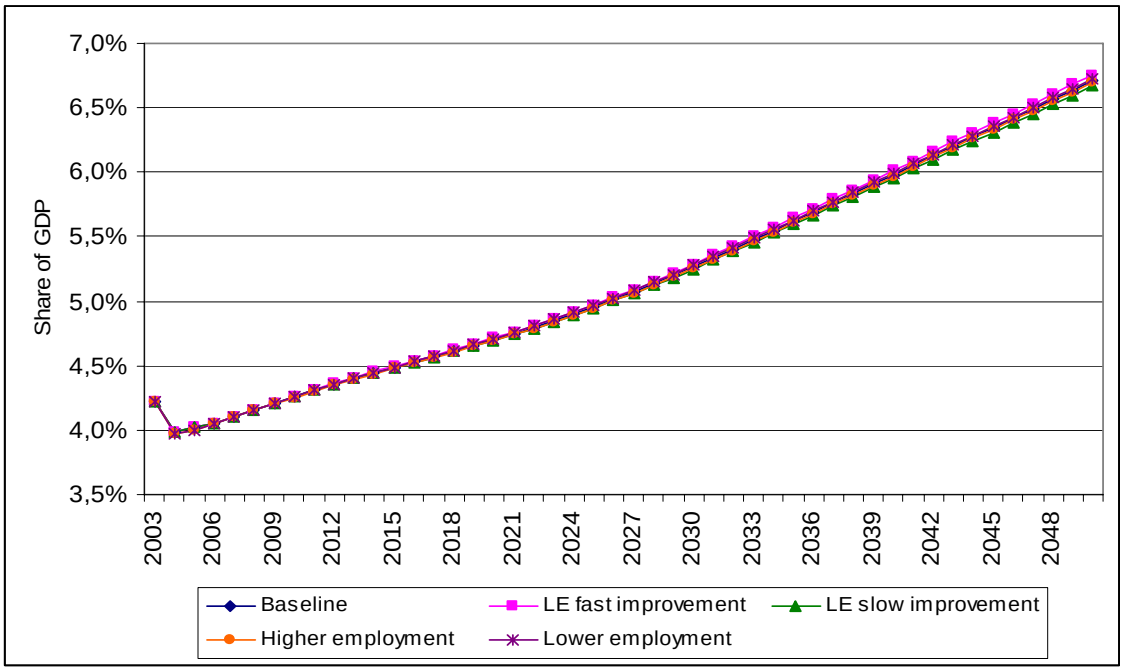
Aim of the current projections was to study the impact of ageing as determinant of health expenditures in Estonia. Applied ILO model for that purposes reflects impact of demographic, economic and labour market factors to the health expenditures and revenues. For the prognosis no change in population health status was assumed. Continuous 1% annual increase of overall health care utilisation was prognosed. Consumption pattern of health care in each age group was kept constant, so the only change in population health care utilization was caused by ageing. The organization of the health care system and health insurance was assumed to remain unchanged during the whole projected period.

During the projected period the health insurance system, which is balanced today having even reserves to reduce macro-economic risks, goes to large deficit more than 3% of GDP, as proportion of those contributing to health insurance would diminish considerably and share of non-contributing insured persons, who consume more health care services, would increase as population ages. Estonian government and EHIF would face huge challenges to sustain the Estonian health care system financing during the next half of century.

To test some uncertainty in the modelling some sensitivity tests were performed. Longevity has increasing impact on both health expenditures and revenues, although the effect is stronger to expenditure side. So, healthy ageing (compression of morbidity) could be a solution to reduce the deficit of health system caused by ageing. Healthy ageing would decrease health care expenditures at the same time it allows persons to stay longer in the labour market. Higher labour market participation and employment rate has larger increasing effect on health revenues, decreasing projected deficit.

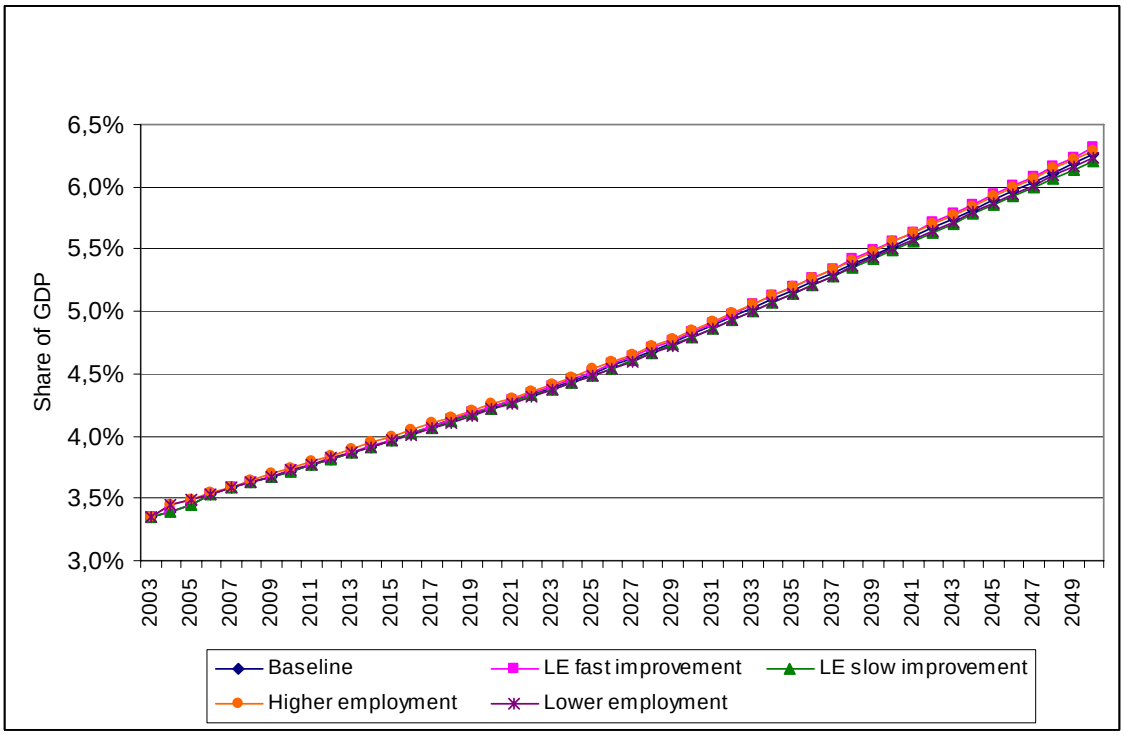
Figures 11-15 describe comparison of results of prognosis and sensitivity tests. The variations of projected results are larger in health insurance revenues due to applied different employment scenarios.

Figure 11. Projected public expenditures on health care as a share of GDP, different scenarios



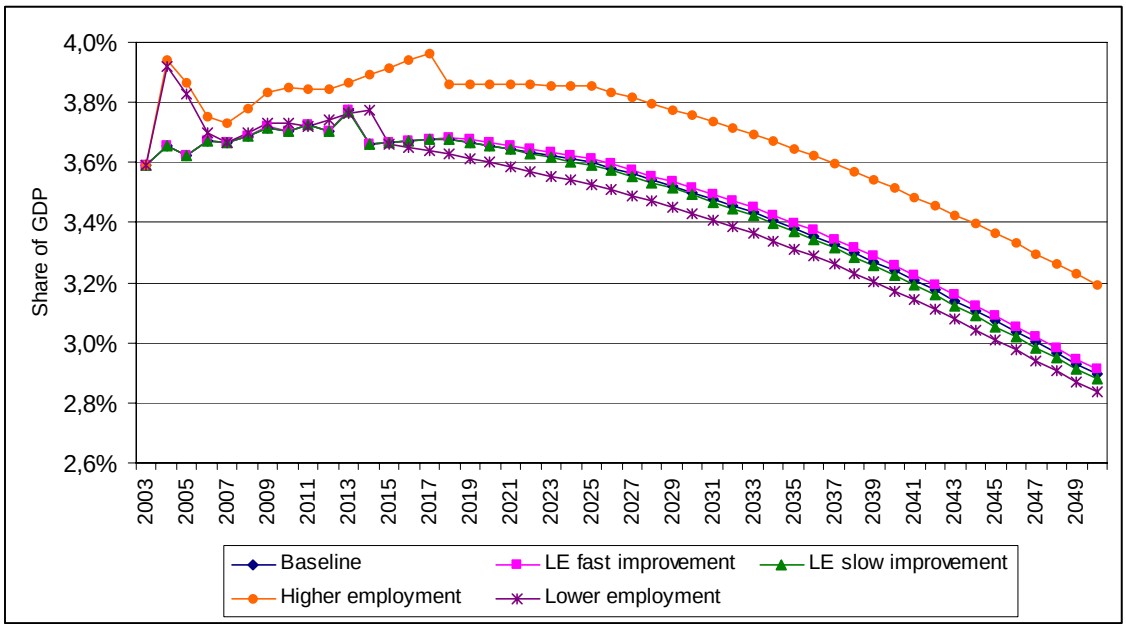
Source: Own calculations.

Figure 12. Projected health insurance expenditures, different scenarios



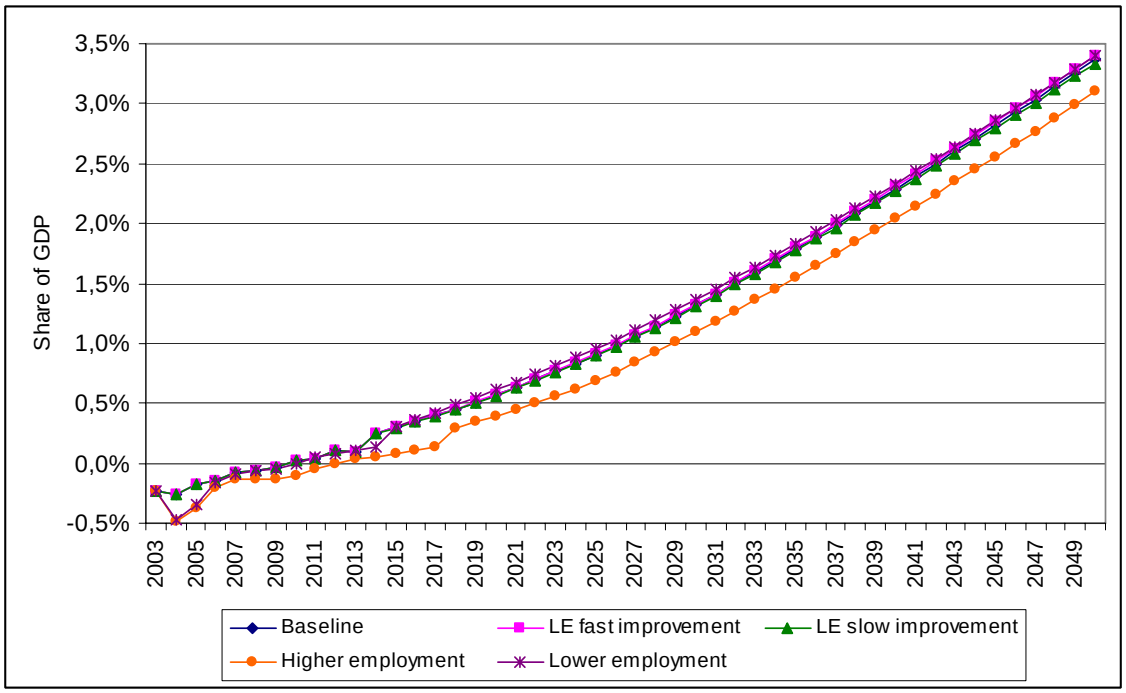
Source: Own calculations.

Figure 13. Projected health insurance revenues, different scenarios



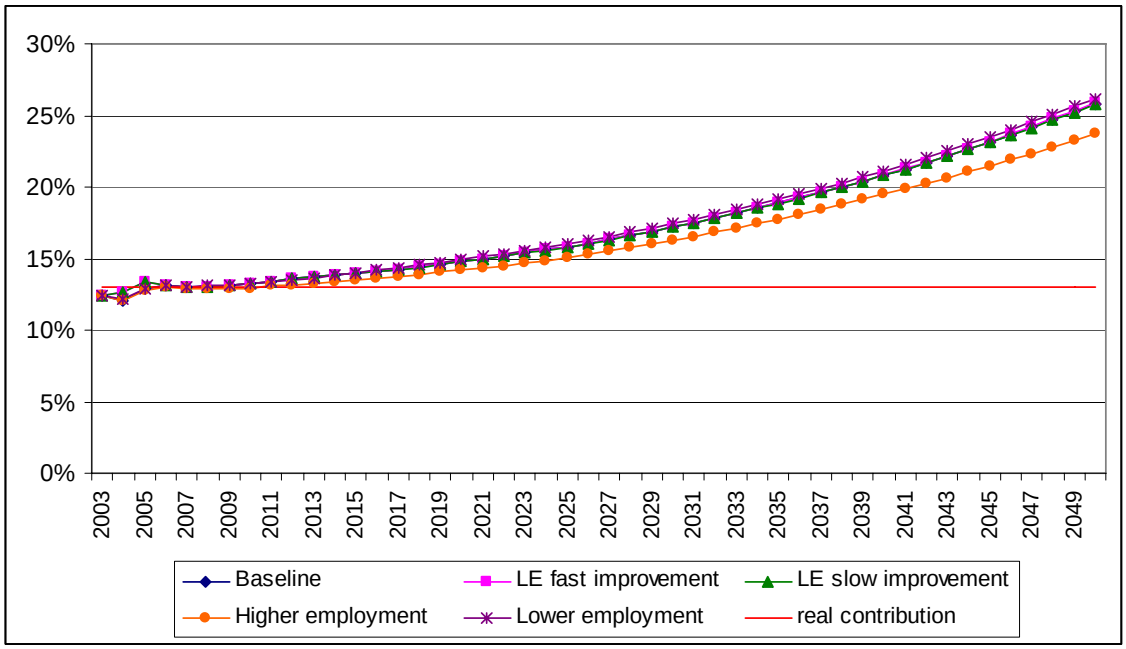
Source: Own calculations.

Figure 14. Projected deficit of health insurance, different scenarios



Source: Own calculations.

Figure 15. Projected contribution rate needed to cover health insurance expenditures, different scenarios



Source: Own calculations.

7. Policy recommendations

So far, the financial position of Estonian health system and health insurance has been stable. However, considering Estonia's demographic situation, it is necessary to implement supplementary measures in order to ensure long-term sustainability. The basic principle is to maintain at least a balanced financial position of state health insurance fees. At the same time, the high-quality services for people must be provided. To guarantee the long-term sustainability of health insurance in circumstances of ageing population, enlargement of the range of people for whom social tax is paid, is necessary.

At the same time attempts are to be made to avoid the further increase in the share of people equal with the insured ones. Currently 94% of the population is covered with health insurance. The costs of emergency medical care for the uninsured 6% of the population are covered by the state budget, and these costs are growing rapidly. Increasing the health insurance coverage of the population will improve the timely accessibility of medical care. To avoid pressure on the health insurance budget, individuals should be taxed directly or by the state/local authorities.

Health insurance expenditures have to be managed and optimized, maintaining expenses at the current level and also taking the society's needs into consideration. Reducing the extent of liabilities of the Health Insurance Fund (e.g. withdraw of cash benefits) has to be considered as a possible means for saving.

Health promotion and health prevention measures should be continuously developed and implemented to maintain population health enabling healthy ageing of the population. This allows keeping people healthy and also longer in labour market which would be crucial by ageing population.

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About AHEAD

In February 2004, a CEPS-led consortium of research institutes launched the implementation of a three-year project called AHEAD (Ageing, Health Status and the determinants of Health Expenditure). Most of the consortium's 18 partner institutes are members of the European Network of Economic Policy Research Institutes (ENEPRI – see http://www.enepri.org for details). As specified in the call for proposals, the main task of the project is to carry out an "Investigation into different key factors driving health care expenditures and in particular their interaction with particular reference to ageing" in the (enlarged) European Union.

The strategic objectives of AHEAD are to:

- assess pressures on health spending in the existing EU and in selected candidate countries, looking both at those arising directly from ageing and at those affected by changing incomes, social change and methods of expenditure control;
- develop models for projecting future health spending and
- estimate confidence limits for these projections.

Expenditure on medical treatment has tended to rise as a proportion of national income throughout the European Union. A particular concern is that an ageing population and therefore the presence of more old people will create further pressures for expenditure on health care. This issue is of concern both in its own terms and because of its fiscal implications. Rising health expenditures put pressure on the targets of the Stability and Growth Pact. They also raise the question whether budgetary targets should be tightened ahead of projected growth in public expenditures, so as to 'save up' for future spending and keep expected future tax rates reasonably constant.

This project has aimed to refine existing estimates of the links between reported states of health and use of medical services. As well as looking at the effects of ageing on health care, the research has taken account of the link between health expenditure and fertility rates and the demands on health services made by non-native populations. Particular attention is paid to the costs of care near death. One study examined factors other than demand (such as methods of financial control) that may influence health spending. An important aspect of this research is that the work is carried out so as to be able to provide not only the familiar projections and scenarios but also standard deviations and confidence limits for predictions of key variables, such as healthy life expectancy and demand-driven expenditure levels. These will allow policy-makers to judge not only possible outcomes but also the risks surrounding them and to assess their implications.

Participating Research Institutes

Centre for European Policy Studies, CEPS, Belgium
National Institute for Economic and Social Research, NIESR, UK
Netherlands Bureau for Economic Policy Research, CPB, The Netherlands
Deutsches Institut für Wirtschahftsforschung, DIW, Germany
Economic and Social Research Institute, ESRI, Ireland
Research Institute of the Finnish Economy, ETLA, Finland
Federal Planning Bureau, FPB, Belgium
Istituto di Studi e Analisi Economica, ISAE, Italy
Institute for Advanced Studies, HIS, Austria
Institute for Public Health, IPH, Denmark
Laboratoire d'Economie et de Gestion des Organisations de Santé, LEGOS, France
Personal Social Services Research Unit, PSSRU, UK
Fundación de Estudios de Economía Aplicada, FEDEA, Spain
Centre for Social and Economic Research, CASE, Poland
Institute of Slovak and World Economy, ISWE, Slovak Republic
Institute of Economics at the Bulgarian Academy of Sciences, IE-BAS, BG
Social Research Centre, TARKI, Hungary
Department of Public Health, University of Tartu, Estonia

About ENEPRI

The European Network of Economic Policy Research Institutes (**ENEPRI**) is composed of leading socio-economic research institutes in practically all EU member states and candidate countries that are committed to working together to develop and consolidate a European agenda of research. **ENEPRI** was launched in 2000 by the Brussels-based Centre for European Policy Studies (CEPS), which provides overall coordination for the initiative.

While the European construction has made gigantic steps forward in the recent past, the European dimension of research seems to have been overlooked. The provision of economic analysis at the European level, however, is a fundamental prerequisite to the successful understanding of the achievements and challenges that lie ahead. **ENEPRI** aims to fill this gap by pooling the research efforts of its different member institutes in their respective areas of specialisation and to encourage an explicit European-wide approach.

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CPB	Netherlands Bureau for Economic Policy Analysis, The Hague, The Netherlands
DIW	Deutsches Institut für Wirtschaftsforschung, Berlin, Germany
ESRI	Economic and Social Research Institute, Dublin, Ireland
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FEDEA	Fundación de Estudios de Economía Aplicada, Madrid, Spain
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IER	Institute for Economic Research, Bratislava, Slovakia
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PRAXIS	Center for Policy Studies, Tallinn, Estonia
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