Health Studies
Lithuania 2016

Importance of Health for Sustainable Growth of Economy

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Vilnius 2017

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Contents

Introduction

The importance of healthcare sector services in the economy is growing. Since 1970 the comparative weight of the healthcare sector within the economy of developed countries has increased more than twice and reached around 10% of the GDP in the European Union and around 17% in the United States. People around the world want better health and higher quality healthcare services and are ready to pay more for it (in the form of taxes and/or social health insurance payments). Most forecasters (at least in the medium term) are expecting further growth of health in modern economies.

The goal of the Health Studies Lithuania 2016 is to present statistics regarding changing role of health in modern societies.

The first chapter is about mutual causation between growth of GDP and health status of population.

- The second chapter is about changing role of health in national employment, outcomes of national economies as well as interaction between health and agriculture, industry, social insurance
- The third chapter is about national management of health with emphasis on Lithuanian experience what regards development and implementation of long term health strategies
- The forth chapter is about statistics of health costs in line with recent development of National Health Accounts (HEDIC)
- The fifth chapter is about recent development of demographic and health statistics.

The study is a continuation of a series of publications developed by Health Economics Center in 2006-2013. These publications had mainly studied functioning of Lithuanian health system thus interplay between health inputs, health outputs and health outcomes. Health Studies Lithuania 2016 is mainly about interplay between development of health sector and development of welfare state. The focus of the paper explains why questions related to demography are concentrated in the last chapter.

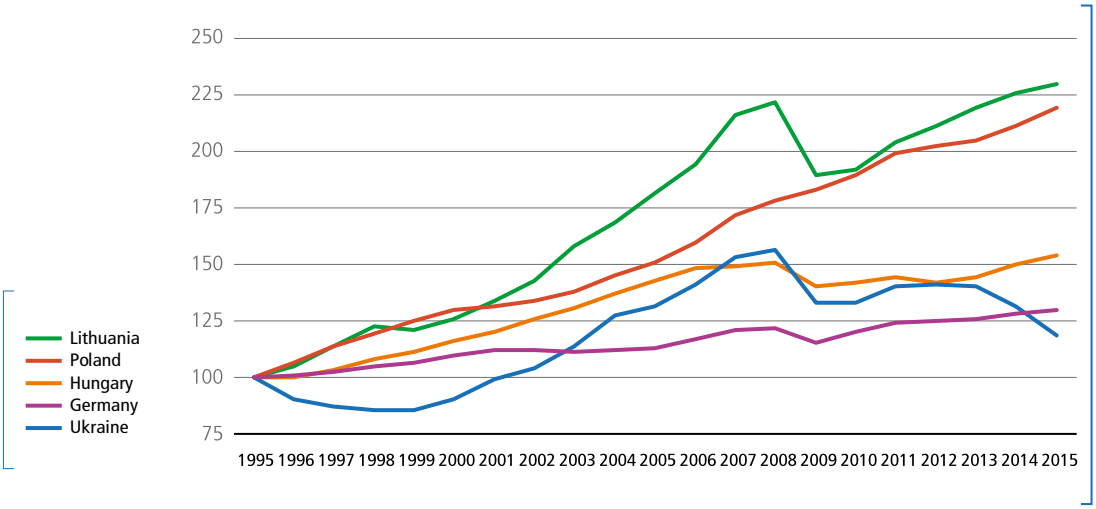
1 Mutual causation between growth of GDP and dynamics of health status of population

Traditional analysis of interaction between health and economic growth is to study dynamics of economic indicators (e.g.) annual growth of GDP as a cause and growth of health as a result of development. The narrative is like this:

- Economy grows.
- Health financing grows faster than GDP thus share of total health expenditures in GDP grows.
- More money for health buys more health services and goods.
- More services and goods provide longer and healthier lives.
- Statistics provides certain evidence to proof or reject these statements.

Economy grows in some countries like Lithuania or Poland relatively fast in some like Germany or Ukraine modestly. Ukraine is important as a reminder that convergence of economies in Europe should not be taken for granted.

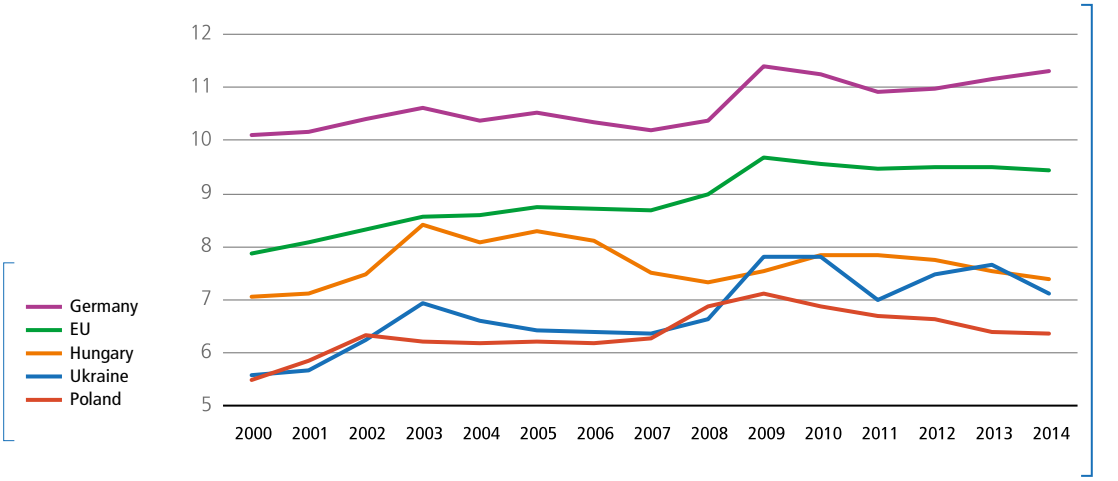
Figure 1. GDP growth in selected European countries, constant prices, 1995=100



Source: IMF database

Share of total health expenditures in GDP grows in some countries like Germany steadily in some like Lithuania or Ukraine – with ups and downs.

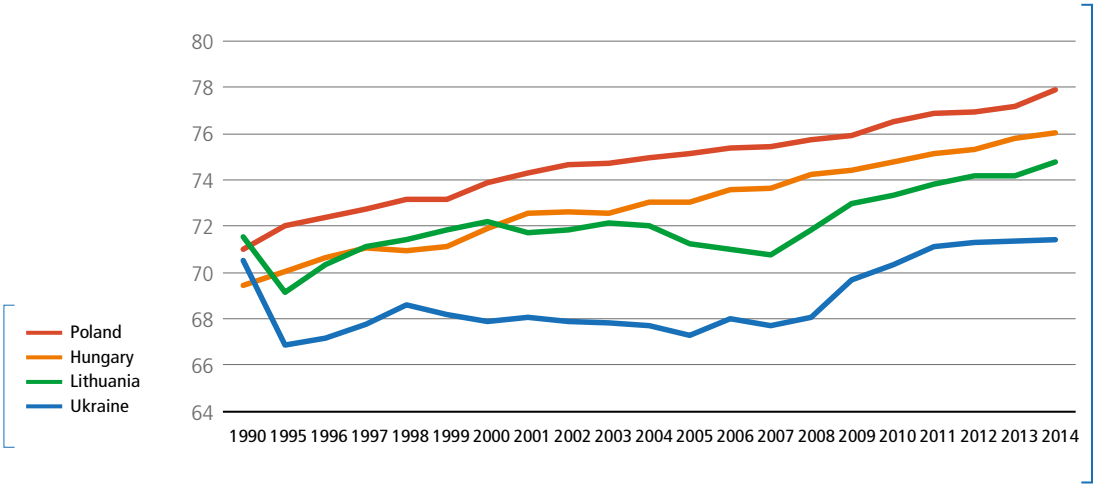
Figure 2. Total health expenditures as percent of GDP in selected European countries



Source: WHO HFA Data base

More services and goods provide longer and healthier lives for citizens of Old Europe, as well as Poland and Hungary but health of Lithuanians grows with breaks and this of Ukrainians is stagnant last 25 years.

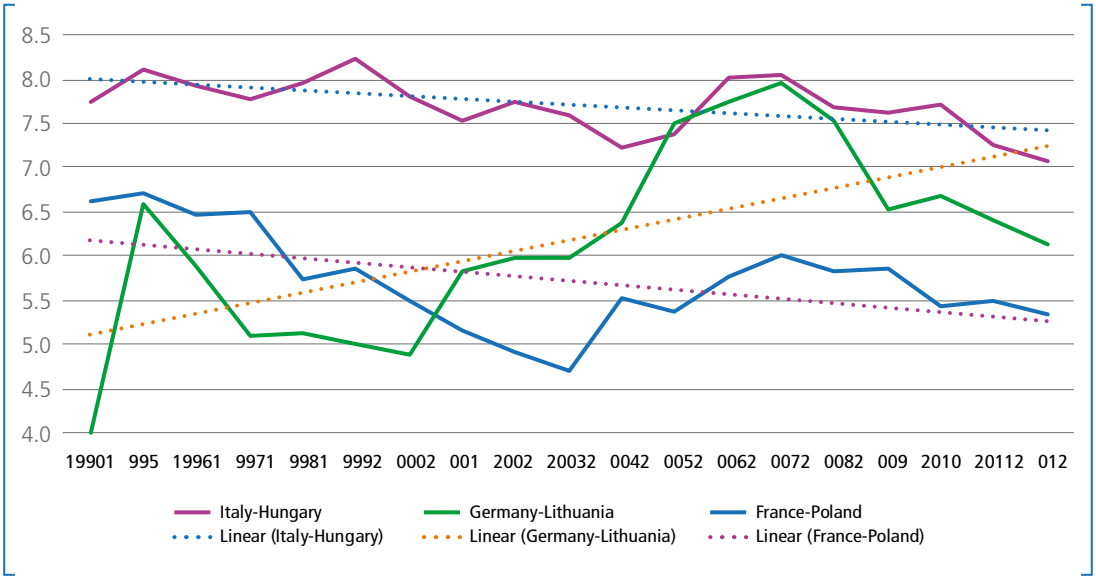
Figure 3. Life expectancy at birth (years) in selected European countries



Source: WHO HFA Data base

The gap between longevity Germany and Lithuania is widening while France, Italy and Hungary, Poland is shortening.

Figure 4. Life expectancy at birth (years). Difference between countries in Old EU and New EU



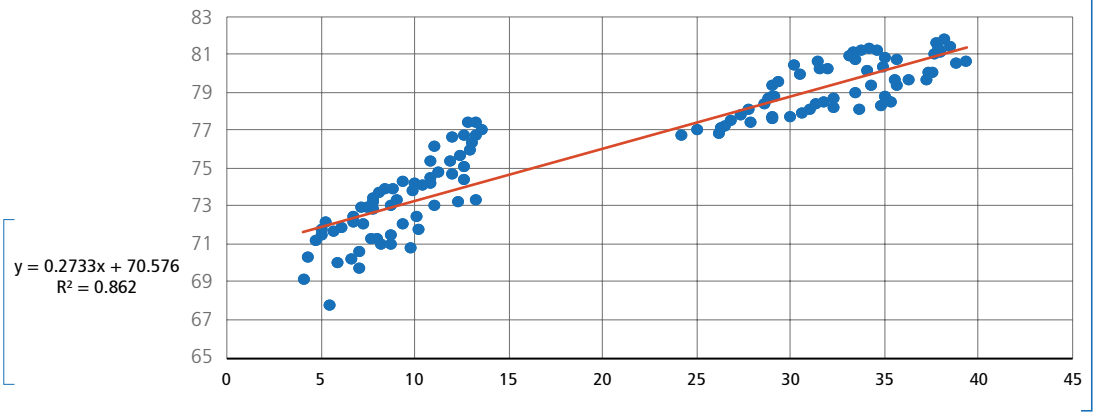
Source: WHO HFA Data base

If theory outlined above (hypothesis growth for health) would be as simple as liner regression models Lithuania and Poland would have to present best progress in health indicators with Germany or Italy lagging much behind. The fact that fast economic growth in Lithuania not manifest itself in record high improvements of health status shows that link between growth of GDP and longevity is not linear. The conclusion is not a surprise for people in public health who know that determinants of health are not just about input of resources in health services or goods.

Picture reflecting correlation of GDP per capita and life expectancy (LE) in Northern part of Eurozone (Estonia, Germany, Finland, Lithuania, Netherlands, Slovakia) during 1995-2014 is indicating importance of economic development for health (residents of richer countries on average live longer) as well as non-liner links between economic and social variables:

- For most of years figures for countries having relatively low GDP per capita (new members of Eurozone represented in the lower "cloud") are above the trend. New democracies are likely learning from peers how to improve health.
- Old members of Eurozone represented in the upper "cloud" have different GDP but very similar life expectancy.

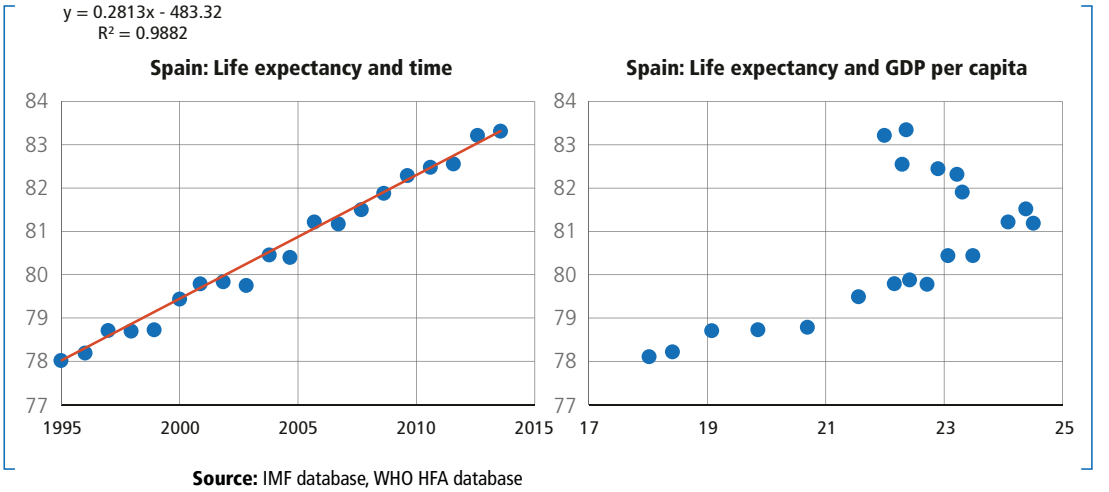
Figure 5. Life expectancy at birth (years) and GDP per capita (thousand euro) in 1995-2014 (Estonia, Germany, Finland, Lithuania, Netherlands, Slovakia)



Source: IMF database, WHO HFA database

During certain periods of development growth in life expectancy (LE) may even go in opposite direction to this of GDP, thus making correlation between variables quite weak. Recent example of GDP and LE moving in to opposite directions is Spain with constant growth of live expectancy during 1995-2014 and reduction of GDP since 2009.

Figure 6. Life expectancy at birth (years) by time and GDP per capita (thousand euro), Spain 1995-2014

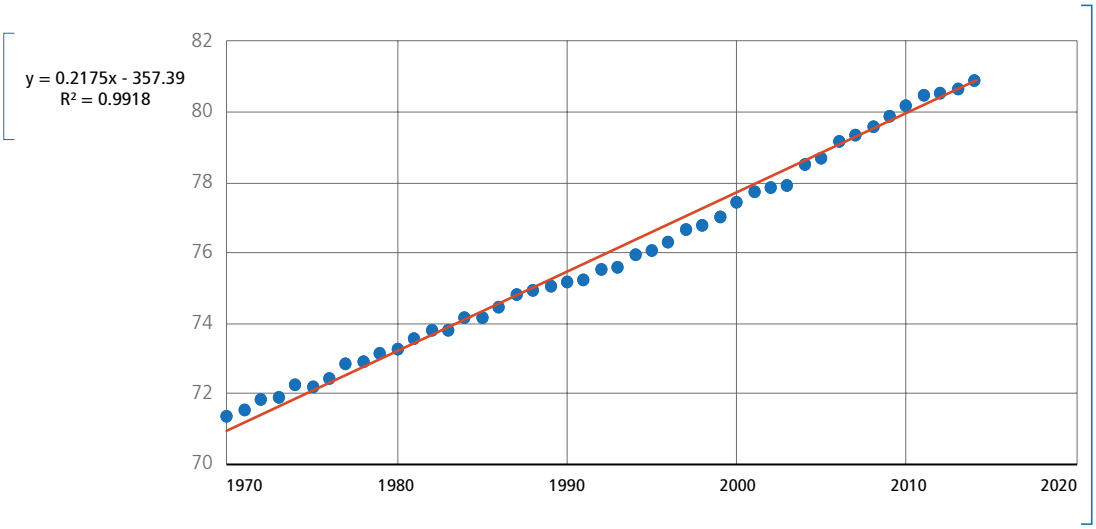


Source: IMF database, WHO HFA database

The fact that during the period of 1995-2014 each year was constantly adding around 0.25 years to longevity of Spaniards or 0.22 years to longevity of EU citizens (see *figure 7*) of course does not mean that time by itself is a cause of better health.

Role of economy (while nonlinear), as well as life styles, environment, development of health technologies play a certain role in the complex action for health.

Figure 7. Life expectancy at birth (years) in EU 1970-2014



Source: WHO HFA database

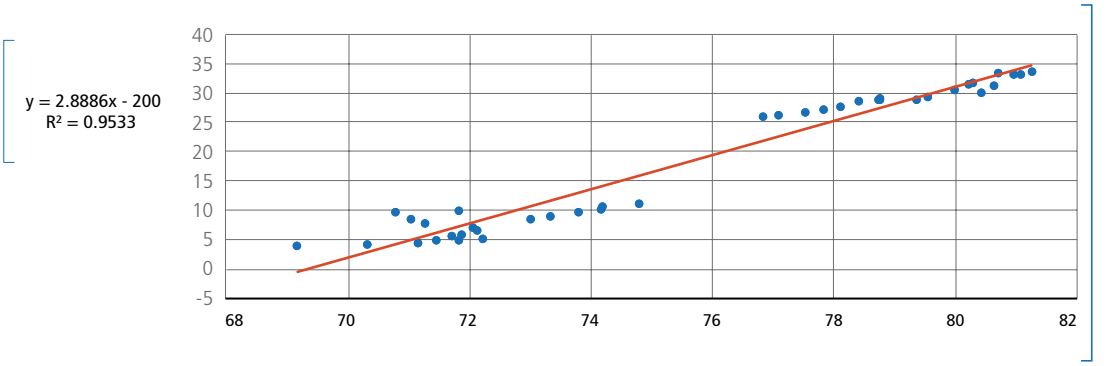
Study will look in to complexity of interaction between economic growth and health from mainly Lithuanian perspective with emphasis on impact development of health sector has for economic growth of modern societies.

Not challenging importance of determinants of health for understanding changes in longevity study will be looking to health measured by life expectancy as an independent variable and GDP as dependant variable. A hypothesis of growth in health as a determinant of economic growth (health for growth) looks as follows:

- Because of progress in medical technologies, lifestyles and environment people live longer and healthier lives.
- Healthier people are more innovative and productive. Leaving longer ceteris paribus means bigger labour force and an opportunity to contribute more to welfare of society in capacity of employee, entrepreneur or just socially active senior.
- Growth of productivity and labour force manifest itself in bigger economic outputs (GDP).

Graphic reflection of health for growth hypothesis according to statistics of Germany and Lithuania during period 1995-2014 is presented on the picture with life expectancy in years on X axis and GDP per capita in thousands of euro on Y axis.

Figure 8. Life expectancy at birth (years) and GDP per capita (thousand euro) in 1995-2014. Lithuania (left part of the picture) and Germany (right part of picture)



Source: IMF database, WHO HFA database

- Correlation between longevity and GDP presented in the picture is very strong ($R^2 = 0.9533$), but it would be risky to assume that 1 year of increase in longevity is the only cause of increase of annual GDP per capita by 2.9 thousand euro. According to theories of economic growth technological progress is the main reason why GDP per capita is growing. From EU data presented in picture we know that recently LE in EU is growing about 0.3 percent per year thus may contribute to similar growth of annual GDP. Increase of annual GDP by 0.2-0.3 percent contribute to about 10 percent of recent economic growth in Europe. Taking in to account that longer life of socially active seniors in retirement (according to current methodology of national accounting) is not directly reflected by GDP the assessment of health as determinant of 10 percent of economic growth should be considered just as a very suggestive estimate.
- The precise quantification of health impact on growth is not a purpose of the study. On the other hand, it is likely that both hypothesis (growth of GDP is a cause/determinant of health and growth in health is a determinant of economic growth) are somehow correct that there is a phenomena of mutual causation between growth of GDP and health status of population.

Interplay between health and economy is not just about growth of LE and GDP. The historical trend of a changing role of health sector in national employment and production of value added are looked through in the next chapter.

2 Health as a growing part of modern economy

During the XX century structure of economy has undertaken big changes that are continuing up to day.

At the beginning of XX century most of world's population has been employed in agriculture with manufacturing dominating the labour force in most developed economies. As role of agriculture since these times is in constant decline, manufacturing started to lose positions around 1950-1970 services have become the biggest sector of economy. According to three-sector theory (*developed by Alan Fisher, Colin Clark and Jean Fourastié*) it makes sense to talk about free big sectors of economy:

- The primary sector – includes activities directly related to natural resources, e.g. farming, mining and oil extraction.
- The secondary sector – covers all the other goods production in the economy, including the processing of materials produced by the primary sector. Manufacturing is the main element in this sector.
- The tertiary sector – includes all the private sector services, e.g. distribution, insurance, banking and finance, and all the public sector services, such as health and defence.

Certain pieces of international statistics illustrate the trend during las 50 years.

United Kingdom was the country leading industrial revolution and replacing agriculture by manufacturing in XIX century. It is the country having today one of lowest shares of secondary sector in Europe.

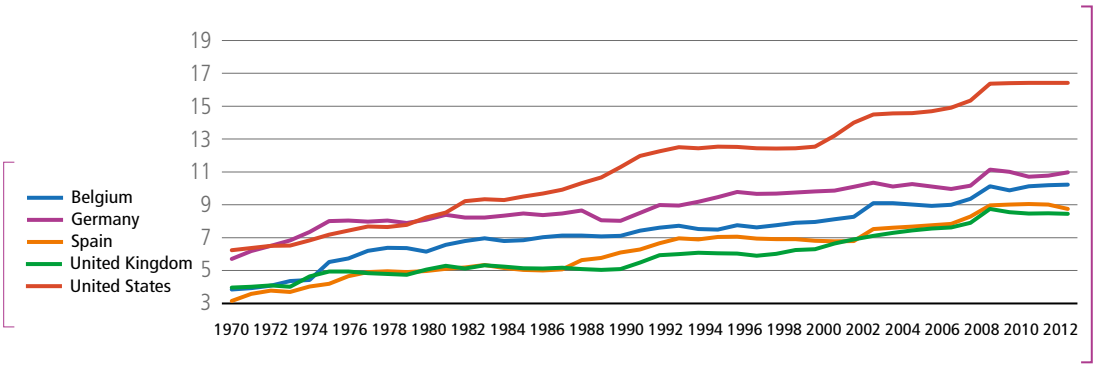
Table 1. Percentage shares of GDP in United Kingdom at factor cost

	1964	1969	1979	1990	2009
The primary sector	5.8	4.3	6.7	3.9	3.7
The secondary sector	40.8	42.0	36.7	31.5	19.4
The tertiary sector	53.8	53.0	56.5	64.4	76.8

Source: www.economywatch.com

The relative importance of health in economy of UK has increased even faster than this of tertiary sector. Figure 9 shows that share of current expenditures on health in GDP of UK and other countries of West Europe had increased from 3-4 percent in 1970 to 7-9 percent in 2011-2013 with USA presenting even bigger change. The double increase of health spending in GDP from 1970 to 2012 is common to most of developed economies.

Figure 9. Health expenditures (percent of GDP) in selected countries, 1970-2014



Source: OECD

Empirical data from the chart indicates that role of health in modern economy grows with some periods of relative calm. Steps especially clear in US with acceleration in 1988-1990, 2000-2002, 2008.

The fact that most of economic activities recently are concentrated in the tertiary sector provided a reason for some researches to divide this sector in to two parts. According to Zoltan Kenessey transportation, electric, gas and sanitary services, wholesale and retail trade have to be accounted as tertiary sector and finance, insurance, and real estate, social services, public administration as quaternary sector.

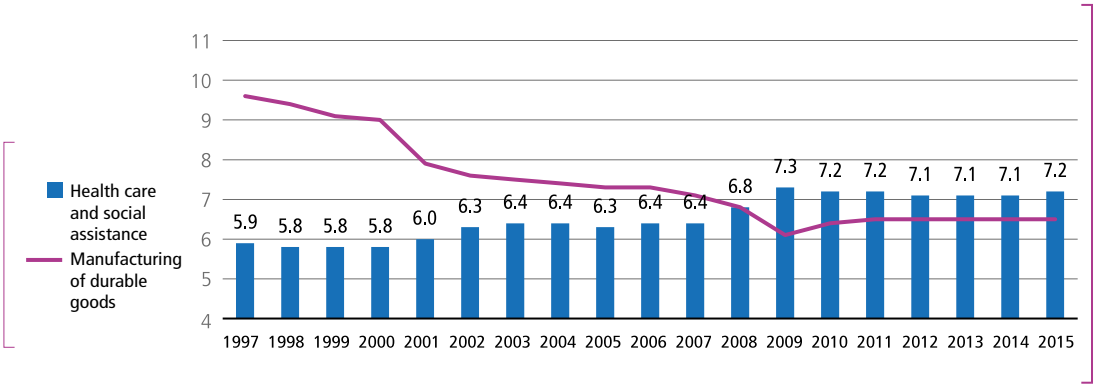
Table 2. Structure of US economy by sectors, value added approach, percent

	1929	1947	1969	1979	1985	2015
Primary	12	**11.5**	**8.0**	**6.6**	**6.2**	2.8
Secondary	30	**28.4**	**29.8**	**27.7**	**26.6**	17.7
Tertiary	26	**24.2**	**23.2**	**25.6**	**26.5**	14.7
Quaternary	31	**36.0**	**39.0**	**40.2**	**40.8**	62.4
Health care and social assistance						7.2

Source: Survey of Current Business, for 2016 utilities are included in to secondary sector. Because of rounding the components do not aggregate to 100.

Whatever classification is used it is clear that the approach used by classical political economy (*A. Smit, D. Ricardo, K. Marx*) to consider as productive just industries included in primary and secondary sectors is a relic of XIX century, that agriculture, mining, manufacturing, trade and transportation combined (industries representing most of economic activities in the middle of XX century) currently are producing less than 50 percent of total economic output in most developed economies. US statistical data shows that contribution of health to creation of GDP since last decades of XX century is bigger than this of all primary sector. Figure 10 shows that since 2008 Health and social services for US economy in terms of value added became more important than all manufacturing of durable goods (metals, machinery, computers, vehicles and so on) America was always proud of.

Figure 10. Value added in United States, percent of GDP, 1997-2015

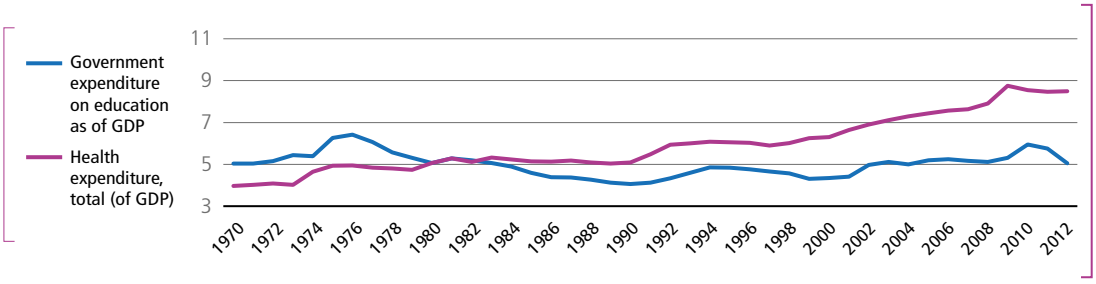


Source: Bureau of Economic Analysis. Release Date: July 21, 2016

The chart is important not just for understanding of structural dynamics. Traditionally manufacturing of durable goods plus construction is considered as a proxy for investment in Physical capital. Taking in to account that share of construction in US value added is around 4 percent, health as an investment in human capital has evolved as one of most important contributors to economic growth in the long run.

Apart of health education is also considered as a contributor to development of human capital that means economic growth in the long run. Figure 11 presents "competition" for scarce resources between health and education, two sectors traditionally considered as contributors to human capital.

Figure 11. Expenditures on education and health in United Kingdom, 1970-2012



Source: OECD, WB database

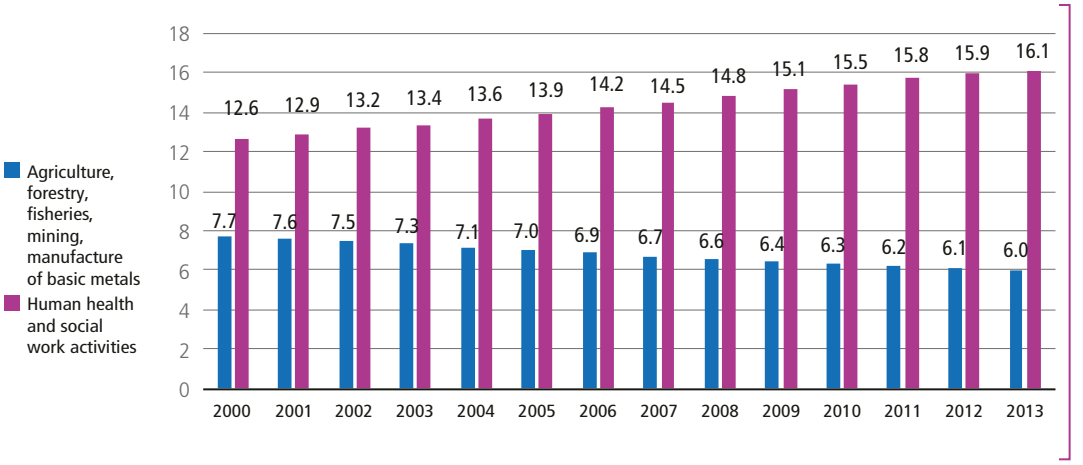
Data from UK shows that education in comparison to health was probably more important sector of economy in the period of 1970-1980. Since 1990 according to data provided by national accounts health is clearly the biggest source of investments in to human capital.

Europe also has witnessed relative growth of health sector. Let's look at the growth of health sector from perspective of the process of European economic integration.

The middle of the last century has witnessed political integration of Europe with European Coal and Steel Community (ECSC) formally established in 1951 by the Treaty of Paris, which was signed by Belgium, France, West Germany, Italy, the Netherlands and Luxembourg. The ECSC ultimately evolved in to European Economic Community (EEC) (Rome Treaty of 1957) and European Union (EU) (Maastricht Treaty (1992). Since establishment above mentioned European institutions especially cared about mining and heavy industry (coal and steel), agriculture and fisheries (sector receiving biggest share of EU financial resources. Until 2012 more than 50 percent of EU budget had been allocated for "Preservation and management of natural resources"). Most recent data show that structure of EU economy today is quite different from the priorities spelled by founding fathers and still reflected in EU organizational structure.

Eurostat data shows that employment (Eurozone, 19 countries) in health and social work has exceeded this in traditional for EU segments of economy such as agriculture, forestry, fisheries, mining (proxy for coal) and manufacture of basic metals (proxy for steel) combined by about 5 million in 2000. Since 2000 employment in health has been steadily growing (economic recession of 2008-2009 has not halted the trend) while in traditional segments constantly falling. Employment in health and social work has exceeded this of traditional segments by 10 million in 2013.

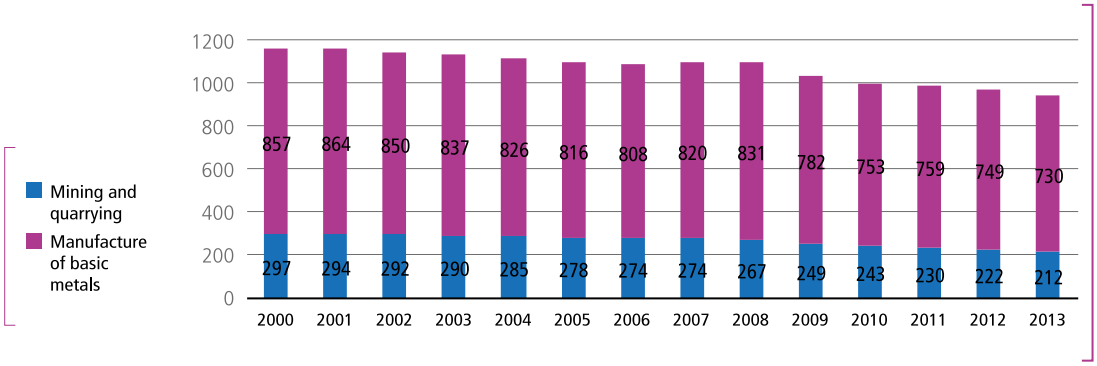
Figure 12. Employment in Eurozone, traditional industries and health, millions



Source: Eurostat, Extracted on 2016-08-05

Employment in mining and manufacture of basic metals in Eurozone since 2010 is below 1 million or just about 6 percent of employment in health and social work.

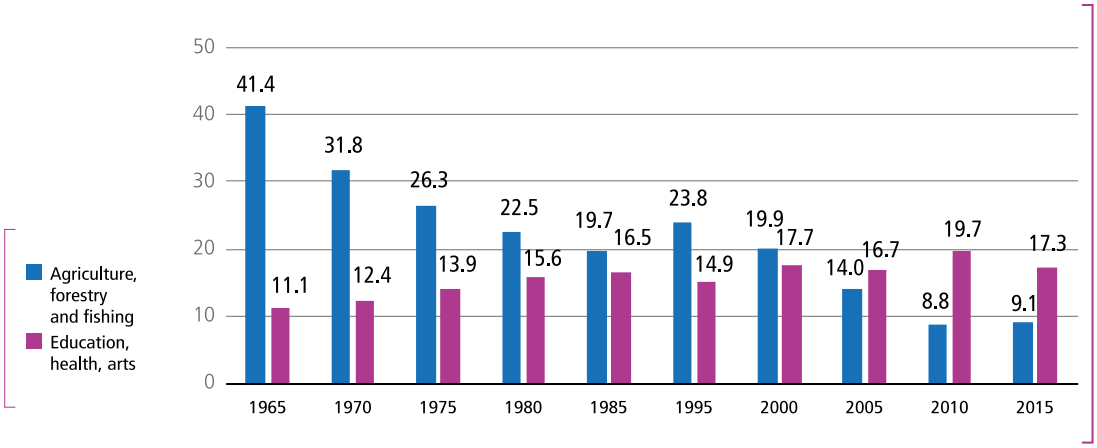
Figure 13. Employment in Eurozone, mining and manufacturing of basic metals, thousand



Source: Eurostat

Primary sector of economy in Lithuania is on decline like in other Member states but the process is lagging behind the peers for about 50 years. Combined employment in Lithuanian sectors of education, health and arts had exceeded this in agriculture, forestry and fisheries just around Millennium.

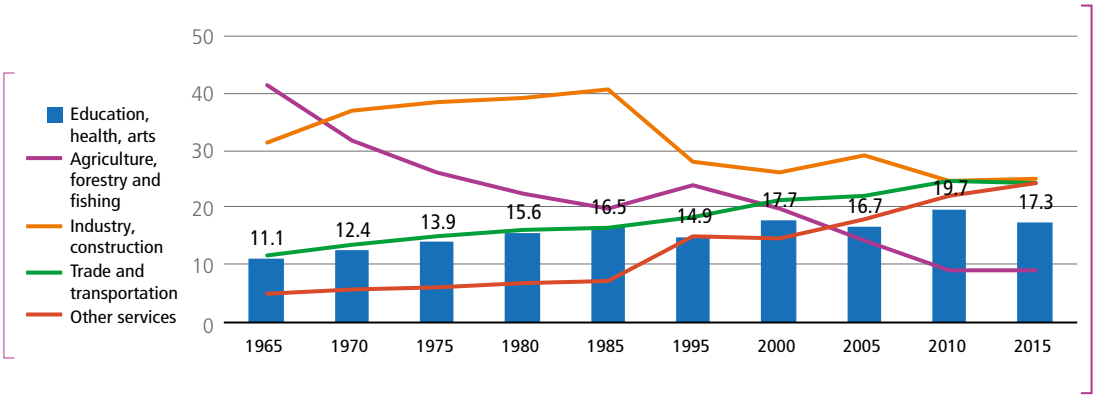
Figure 14. Employment in Lithuania, agriculture versus social infrastructure, percent of total employment



Source: Statistics Lithuania

Structure of Lithuanian economy by all sectors is presented below.

Figure 15. Employment in Lithuania, main industries, percent of total

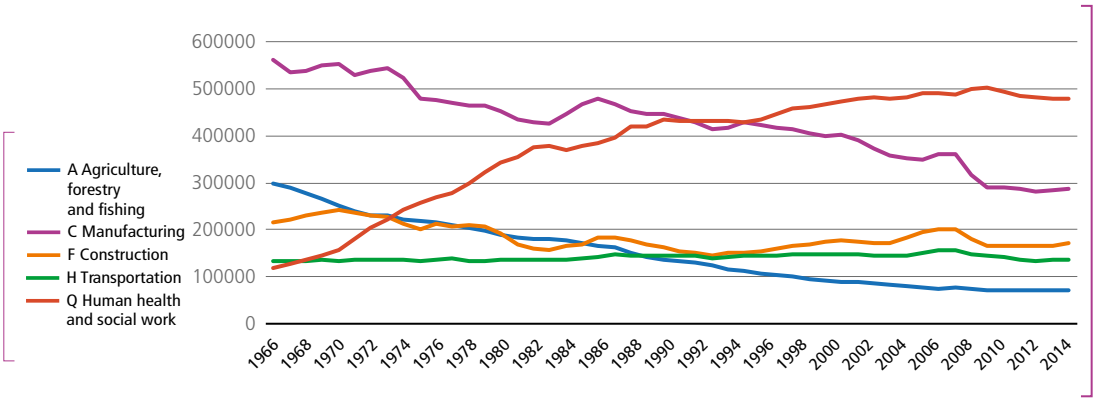


Source: Statistics Lithuania

Taking into account that health in Lithuania by employment is about 35 percent of sector (education, health, arts) employment in industry 7 times exceeded employment in health and agriculture measured by employment figures was 10 times bigger than health in 1965. In 2015 health in Lithuania is still 1.5 times smaller than agriculture, forestry and fishing and almost 3 time smaller in comparison to industry and construction.

Employment data from Denmark illustrates developments during last 50 years.

Figure 16. Employment in Denmark, main industries

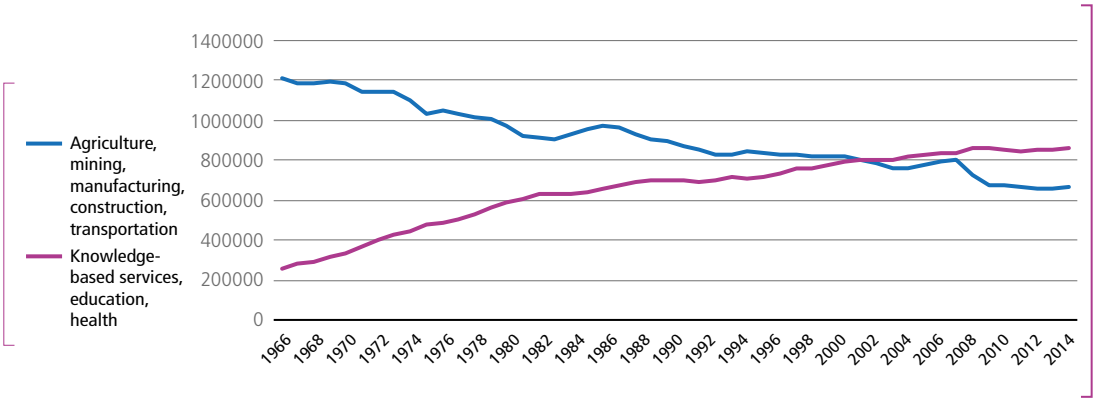


Source: Statistics Denmark

Employment in industry 5 times exceeded employment in health and agriculture measured by employment figures was 3 times bigger than health in 1965. In 2015 health is 6 times bigger than agriculture, forestry and fishing and almost twice bigger in comparison to manufacturing.

To make the picture simpler all productive (according to XIX century tradition) industries are compared with 3 social industries (science, education and health).

Figure 17. Employment in Denmark, industries producing goods versus social infrastructure

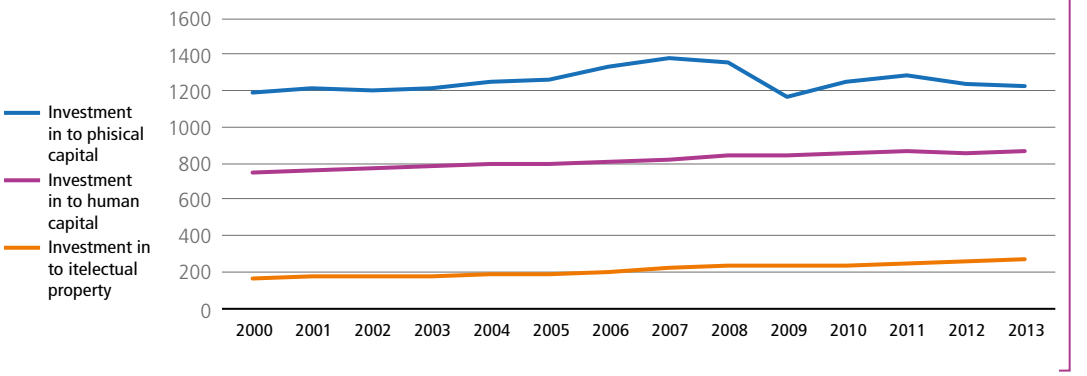


Source: Statistics Denmark

The importance to illustrate long term trends by national statistics is based on lack of regional data for periods starting before 2000. Since 2000 most of measurements have national data as well as data for certain groups of member states.

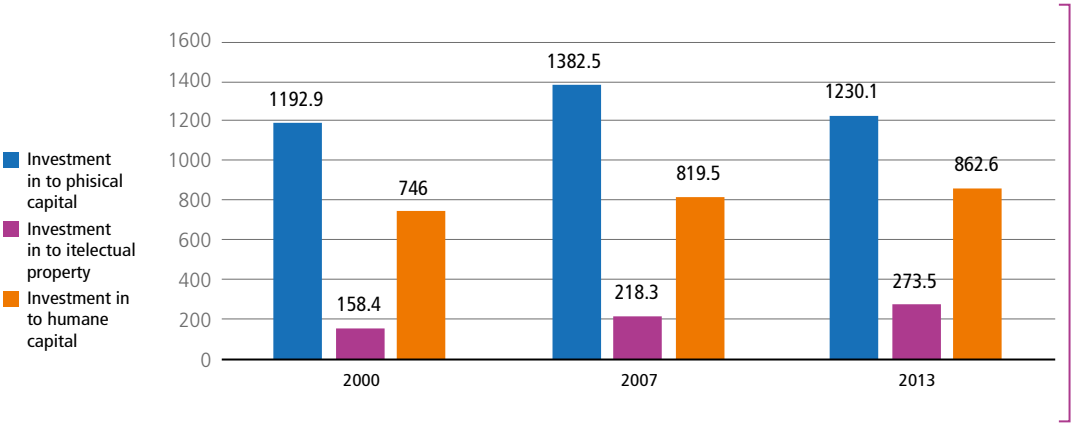
Insigne in to health as an investment will be illustrated by Eurozone (19 countries) figures. The reason is to present most of "old" member states with some flavour of countries (including Lithuania) from the Central and Eastern Europe. Under assumption that mining, manufacture coke and refined petroleum chemicals and chemical products, computer, electronic and optical products, electrical equipment machinery and equipment, motor vehicles, trailers, repair and installation of machinery equipment as well as construction is a proxy for investment in physical capital; computer programming, consultancy, and information service activities as well as scientific research and development of new technologies is a proxy for investment in intellectual property; education, human health activities, creative, arts and entertainment activities; libraries, archives, museums and other cultural activities is a proxy for investment in human capital, investment in real economy of Eurozone is presented in figures 18-19.

Figure 18. Investment in Eurozone, physical capital, human capital, intellectual property, 2000-2013, chain linked volumes (2005), billion euro



Source: Eurostat

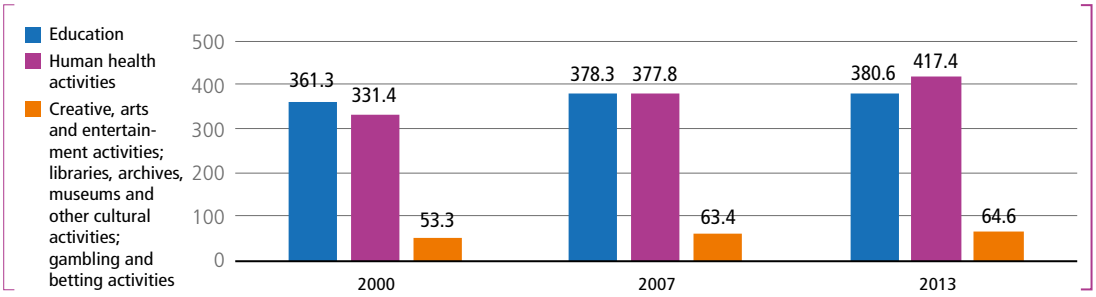
Figure 19. Investment in Eurozone, physical capital, human capital, intellectual property, chain linked volumes (2005), billion euro



Source: Eurostat

Figure 18 indicates volatility of investment in physical capital mainly during recession of 2008-2009. Figure 19 more clearly visualises dynamics of different type of investment with investments into physical capital overall stable, moderately growing investments into human capital and fast growth of investments in to intellectual capital.

Figure 20. Investment in human capital, Eurozone, chain linked volumes (2005), billion euro

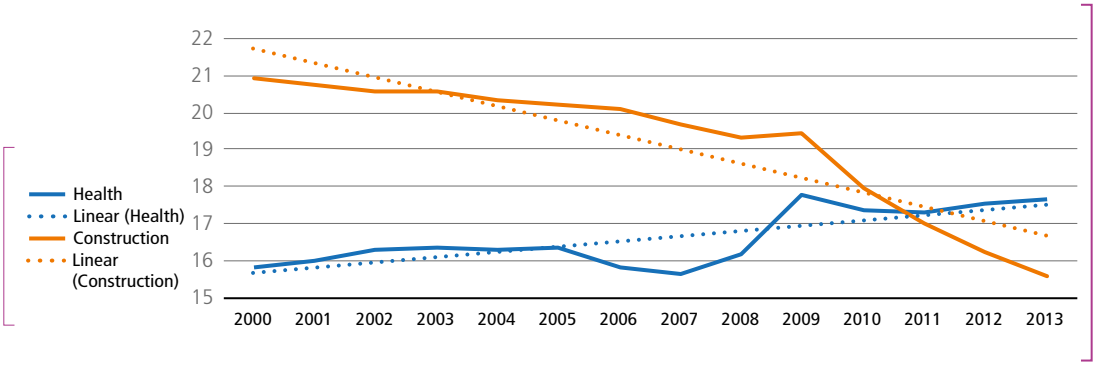


Source: Eurostat

Structure of investment in human capital is changing. Education has witnessed just 5.3 percent growth during the period and lost its leading role in value added creation to health. Health sector was bigger in 2013 in comparison to 2000 by 25.9 percent.

The share of health in total investment is presented by Figure 21. Growth of importance of health as an investment sector is indicated by growth of its share from 15.8 percent in 2000 to 17.6 percent in 2013 as well as by fact that since 2011 human health sector of Eurozone 19 countries is creating bigger value added than construction sector.

Figure 21. Investment in Eurozone, health versus construction, percent of total value added



Source: Eurostat

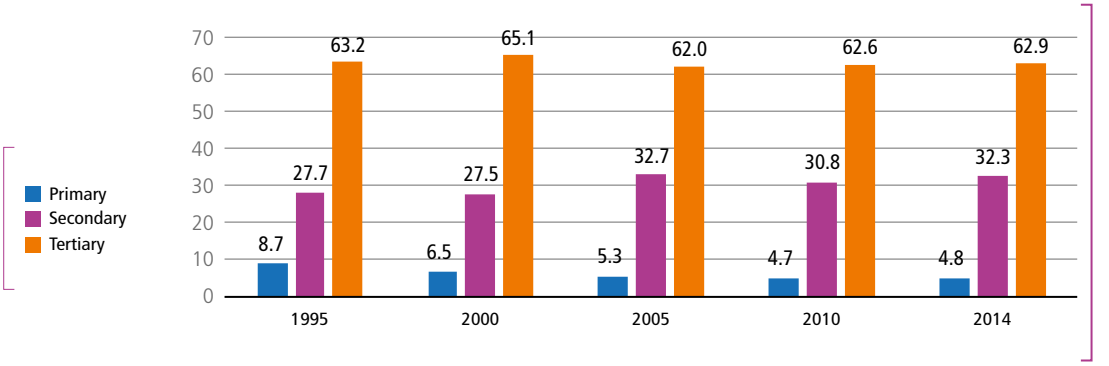
The statistical figures presented above are not reflecting activities in informal economy. The notion that self-care provided by the patient himself or his/her family members is a fundamental pillar of health and social care is an essential component of a modern health care system. The construction undertaken by families is common in rural societies but it is marginal in Eurozone countries. Role of health would increase much stronger in comparison to role of construction if role of households would be reflected.

Role of health in Lithuania

Long term trends of structural change in Lithuania are difficult to measure because of dramatically changed statistics and socio-political transformations of late eighties and early nineties. Data processed by Eurostat (since 1995) shows that:

a) Primary sector of economy in Lithuania is shrinking but it is still more important (mainly because of agriculture) than for most Western economies and the secondary sector is rather stable or even slightly growing in Lithuania (outsourcing of manufacturing from Western European countries to Central and Eastern Europe and further East may be one of reasons)

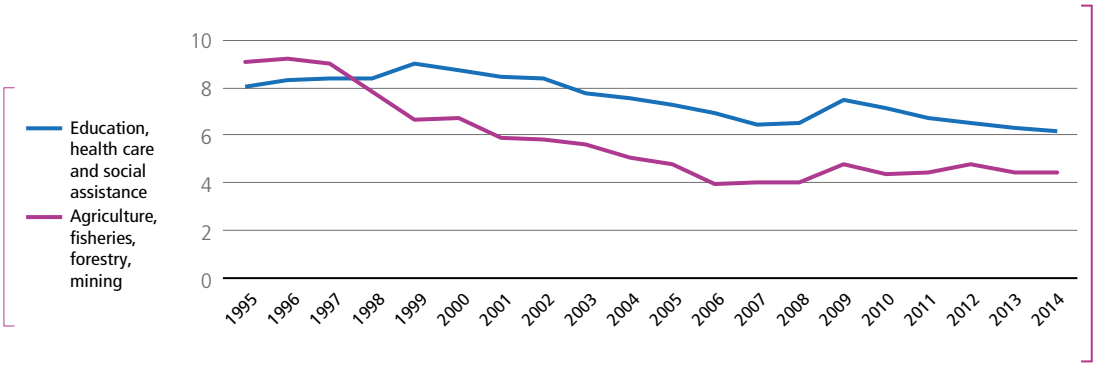
Figure 22. Structure of Lithuanian economy, percent



Source: Eurostat, calculations by SEC

b) Primary sector of economy recently (just before 2000) has lost its leadership in creation of value added to sectors creating investments in to human capital (Education and health). On the other hand, declining share of education and health shows specificity of Lithuania in comparison to most of European countries. Sharp decline of number of students because of fewer births in early nineties partially explains declaim in education.

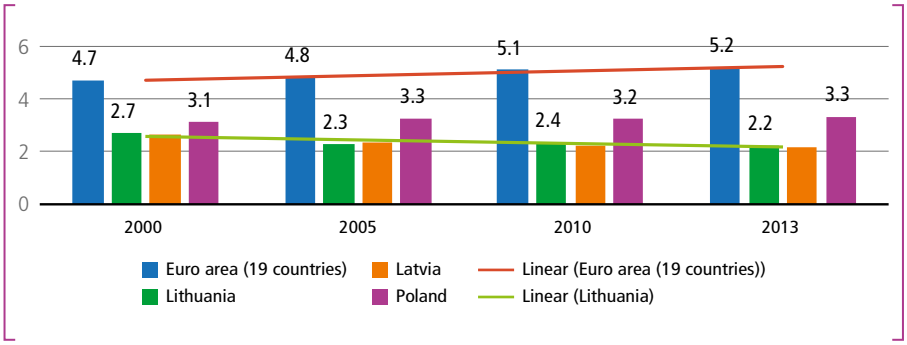
Figure 23. Value added in Lithuania, education and health versus primary sector, percent



Source: Statistics Lithuania

c) Share of health in value added in Lithuania had been reduced from 2.7 percent in 2000 to 2.2 percent in 2013. This declining trend coincides with figures for Latvia but contradicts statistics of majority developed countries.

Figure 24. Health in value added of selected countries, percent



Source: Eurostat

Questions to be debated:

- Why structural issues and economic sectors being of crucial importance in the period of European Coal and Steel Community are much more important for EU structures than health?
- Why theoretical analyst of health as an investment (in to human capital) as well as statistics of constantly growing employment and value added in health has not convinced many especially in the field of finance to stop considering health just as spending or even waist of scares resources?
- Why a lot of research is concentrated to study impact of economic growth (e.g. measured by dynamics of GDP) but very few studies are looking for impact investment in health has on economic growth and social wellbeing?
- Why structural development differs between the countries. What can we learn from successes and failures to be more prepared for management of constructive disruptions generated by structural change?
- What future regarding structure of economy awaits national states, Eurozone, Europe?

Summary of the chapter

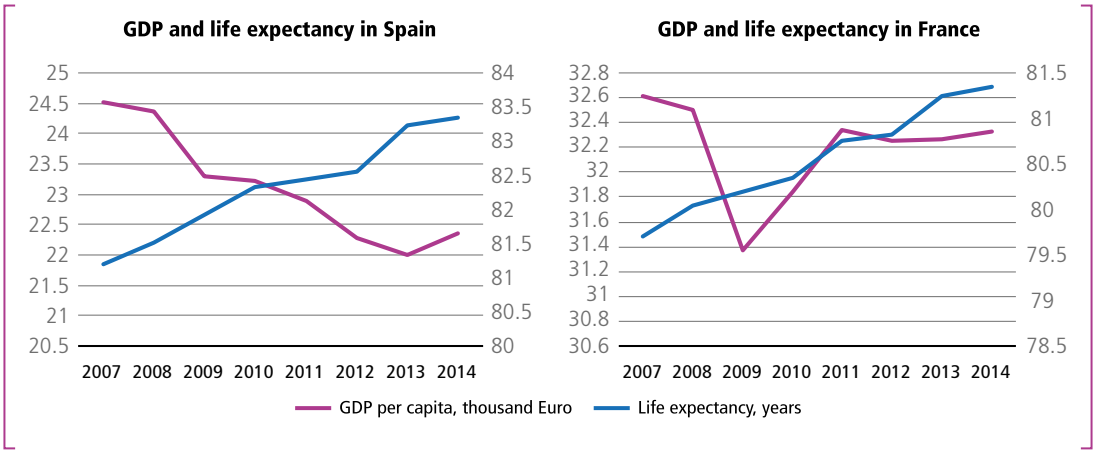
1. In most of developed world health expenditures as a share of GDP are presenting a constant growth.
2. Growth of health sector faster than majority of segments of economy resulted in the fact that today (Eurozone 19 countries) measured by employment health and social work is twice more important than agriculture, forestry, fisheries, mining and manufacture of basic metals combined; health creates bigger value added than education or construction.
3. In the US value added in health and social work has exceeded manufacturing of durable goods (metals, machinery, computers, vehicles and so on) America was always proud of.
4. Changes in structure of real economy have contributed to reshaping of economic theories by marginalizing approach used by classical political economy to consider just agriculture, mining, construction and manufacturing as productive in the beginning of XX century; by introducing concept of primary secondary and tertiary (fastest growing) sectors of economy in mid of last century as well as splitting the tertiary sector in to tertiary and quaternary (fastest growing).
5. Recent theories of economic growth (theory of human capital in particular) have contributed to better understanding of overall role of health sector in modern economies. On the other hand, much more has to be done to consolidation of a narrative about health as an investment sector, progress in development of tools to measure interaction of health and other sectors on macro level, development of toolkit for assessment and dissemination of good European practice in domain of health and growth.
6. Specificity of national economies provides opportunities for analysis of good practises as well as contradictory policies. Whatever are the findings they have to contribute to improvement in socioeconomic policies.

From health in all policies to health for all policies

Health as a factor mitigating volatility of markets and cyclical nature of economy

Statistics of almost constant growth of employment in health sector may be interpreted as a factor stabilizing modern economies during recessions. World recession of 2008-2009 and period of slow recovery of economy during 2010-2014 provided research community with evidence of growing health figures during times of slow or even negative economic growth.

Figure 25. GDP per capita (thousand euro) and life expectancy at birth (years) in Spain, France, 2007-2014

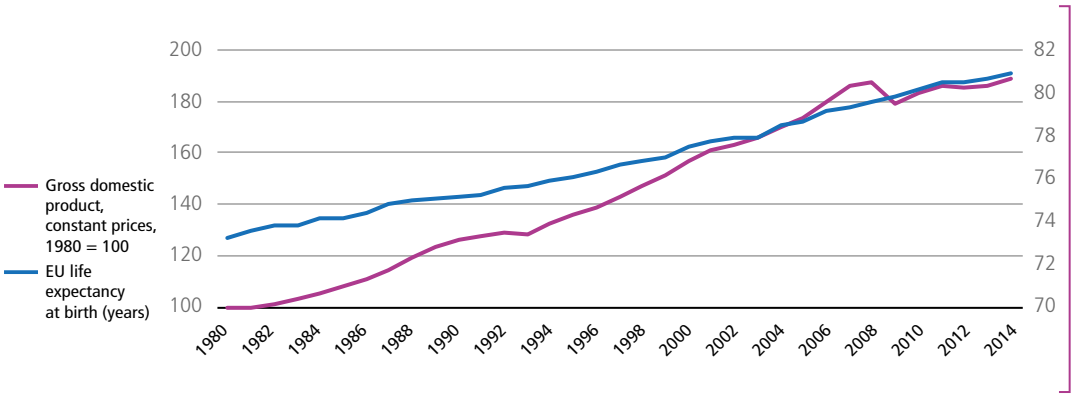


Source: IMF database, WHO HFA database

Divergence of economic and health figures is shaping integrated indicators of wellbeing (e.g. human development index) and, on the other hand, providing better understanding why pessimism of Europeans is not as great as it should be according to just GDP data. The data shows that extra spending of public resources for health during times of economic hardship is not just a measure to boost demand it is an investment providing tangible returns.

In long term perspective correlation between growth of GDP per capita and longevity is quite strong, but according to EU data health was improving faster not just in the period of 2007-2014, but also during mild economic recession of 1993 and stagnation of 1981. During boom of 2004-2007 general economic growth was more robust then this of longevity.

Figure 26. GDP and life expectancy at birth (years) in EU, 1980-2014



Source: IMF database, WHO HFA database

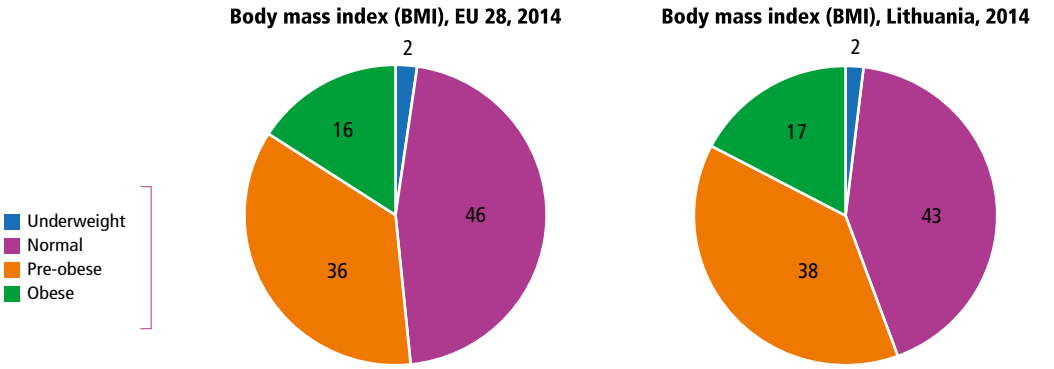
Agriculture was a main contributor to human health until the 20th century. Health concerns are playing an active role in shaping demand for agricultural products in our days

Since the start of human history optimal nutrition was one of the main determinants of health. Until the 20 the century the malnutrition was the main factor limiting health as well as populations growth. Gains in productivity of agricultural production especially in XIX and XX centuries have eliminated hunger in Northern hemisphere and thus importantly contributed to longevity of population in Europe, North America, Japan and later on in China, India, other developing countries.

Since mid of 20th century Developed countries witnessed shifts in demand from importance of staple food (wheat, maze potatoes, basics fats and proteins) to bigger consumer choice regarding taste of food products (fifties-sixties), food safety (seventies-eighties) and recent concerns related to overconsumption of food leading consequently to overweight, obesity, reduction of human health.

Recent statistical data shows that in all EU member states (including Lithuania) numbers of pre-obese and obese people are exceeding these of underweight.

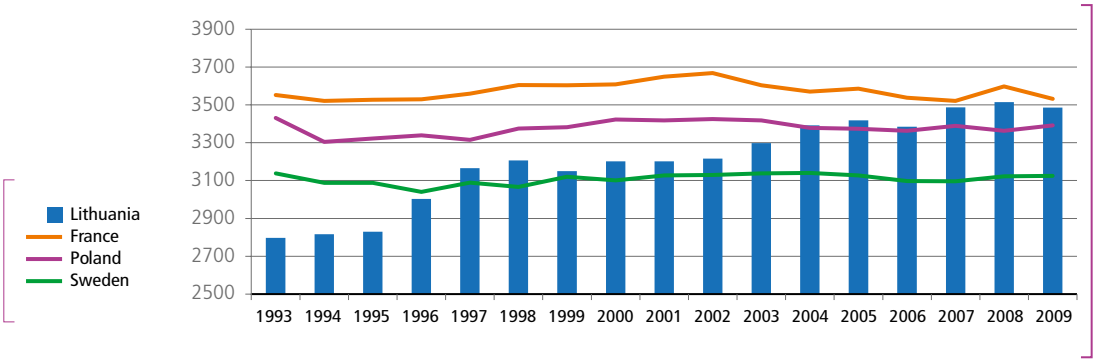
Figure 27. Body mass index in EU, Lithuania, 2014



Source: Eurostat

The society may respond to growth of obesity by reducing intake of calories as well as opting for more physical exercise. Most recent European statistics on intake of calories is presented in the chart.

Figure 28. Calories (kcal) per person per day in selected EU countries



Source: WHO HFA database

Under assumption that Sweden is somehow managing to maintain food consumption on healthy level the optimum consumption during the period 1993-2010 is about 3000 kcal per day. Poland and France are overconsuming according to this "optimum" but they are able to maintain the same level of calories per day. Lithuania is one of very few countries with an increase of intake of calories and has moved from relatively healthy diet to evident overconsumption of food products.

Taking in to account aging of population as well as reducing share of physical activities related to employment (both factors are contributing to decline of optimal intake of calories per day) it is likely that all European countries (even Sweden) should reduce intake of calories because of health concerns.

Health concerns are suppressing physical amount of agricultural production in developed economies as well as transforming the structure of food supplies. Health related demands for more vegetables, less fats, sugars are key in shaping marketing of food products. Movement for healthy diets may even contribute (in case ecological foods are costlier than traditionally manufactured ones) to increases of agricultural output.

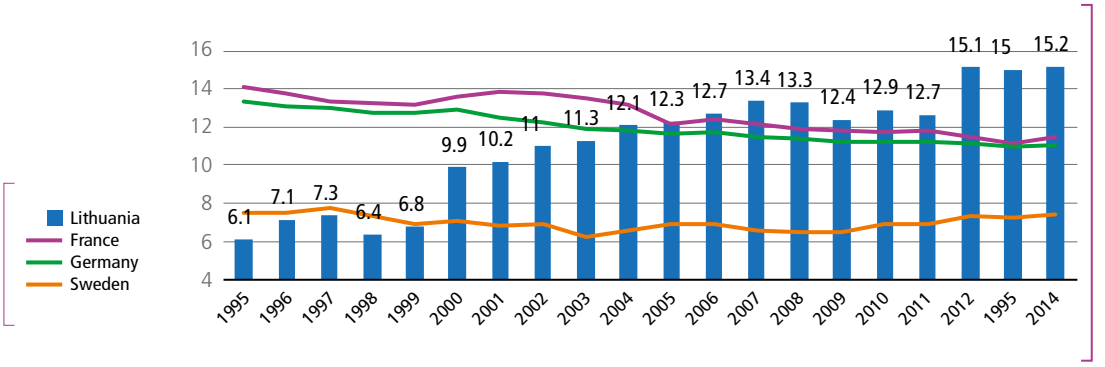
Alcohol markets: trade-off between business interests, public finance and health. Arguments for public health interventions to be considered as a determinant of GDP growth

During centuries of socioeconomic growth alcohol was considered as an important element of Western culture as well as an resource of income for monasteries, landlords and state. Knowledge of negative impacts of overconsumption of alcohol is well documented and had contributed to policies of alcohol control ranging from short term attempts of complete bans in US and Russia and long-term bans in some countries with deep Islamic traditions to different measures of restricting demand or supply of alcohol.

Most of public health experts agree that equilibrium in alcohol markets achieved by interplay of just market forces is at the level contributing to distortion of health. The understanding of market failures is contributing to development of tools to reduce consumption of alcohol. The approach is supported by most of political thinking in Finland, Sweden, Norway and is gaining popularity in Baltic States. Sweden has introduced alcohol controls decades ago and has constant alcohol consumption at a level of about 7 litres of pure alcohol per capita.

Mediterranean countries and Germany were known historically as big consumers of wine/bear reluctant to control alcohol consumption. Recently these countries are gaining taste in substituting alcohol by better health. Comparative international statistics (see. picture) are indicating rapid decline of demand but does not provide an answer about consumption patterns in the future. It may happen that reduction of alcohol consumption in France and Germany will approach the Swedish "optimum" of 7 litters (Italy is at level of 7.5 litres of pure alcohol per capita during the period of 2009-2014) but other trends are also likely.

Figure 29. Pure alcohol consumption per person per year in selected EU countries, litres per capita, age 15+

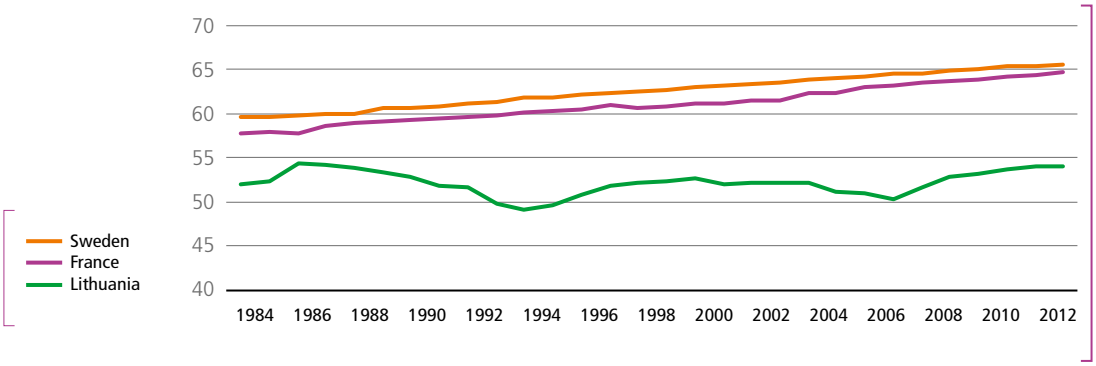


Source: WHO HFA Database

The statistics of alcohol consumption in Lithuania is different. During last 20 years, the country witnessed increase in alcohol consumption (even if it is likely that Lithuanian figures for 1995-1999 were not properly reflecting illegal trade).

Relative growth of alcohol consumption in Lithuania probable was one of reasons of deteriorating health especially in male population above 15 years of age.

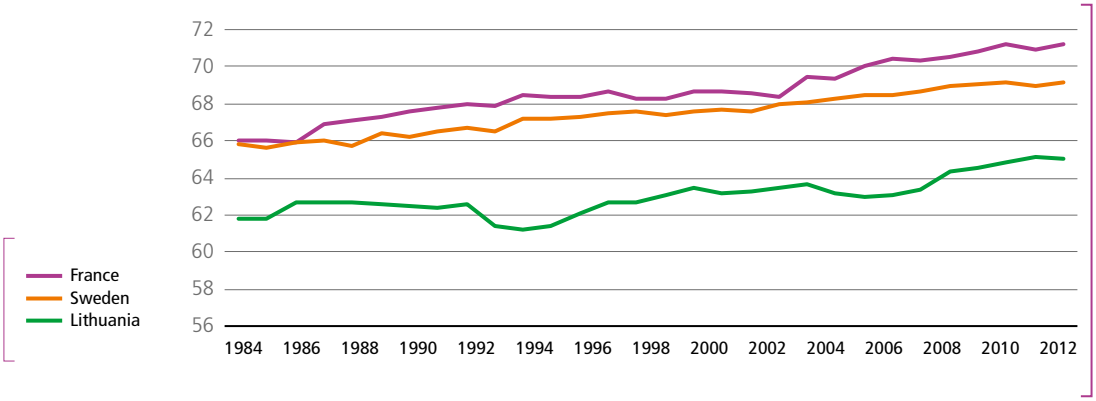
Figure 30. Life expectancy at age 15 in selected EU countries, males



Source: WHO HFA Database

Figure 30 shows that in Lithuania life expectancy of males at age 15 in 1995-1998 was 5.5 years shorter in comparison to this of France and Sweden. The difference exceeds 12 years during the period of 2005-2013.

Figure 31. Life expectancy at age 15 in selected EU countries, females



Source: WHO HFA Database

Figure 31 shows that in Lithuania life expectancy of females at age 15 at the beginning of the period was 4 years shorter in comparison to this of France and Sweden. Currently the difference is at the level of 5 years.

There is a certain probability that alcohol consumption in Lithuania will converge to levels common to these of peers. In order to have the convergence, consumption of alcohol in Lithuania has to decrease by 5 litters per capita or by about 30 percent. Let's look at economics of this likely scenario. Public revenues and expenditures, profits of private businesses, employment, GDP going to be discussed.

One of most effective interventions for reduction of alcohol consumption is a hike in taxes on alcohol. Taking in to account that demand responds to rise in alcohol taxes not immediately it is likely that introduction of alcohol control is positive for tax revenues in short term. Governments have limited powers to increase and

maintain alcohol prices at the level much above these in neighbouring countries (smuggling is one of limiting factors) thus as consumption of alcohol will go down reduction of fiscal gains is likely. Policy of alcohol control what regards excise tax revenues is more or less neutral in long run.

Policy of alcohol control if based on most efficient instruments (hiked prices, increased age limits, bans on advertising) requires limited public financing as well as showing limited public health results during the initial stage of implementation. Reduction of alcohol related diseases (thus health expenditures), disabilities caused by alcohol related behaviours (thus social expenditures), violence (thus expenditures on policing) are reducing public spending in mid and long term. Policy of alcohol control what regards public expenditures is neutral in short term and positive for reduction of public expenditures in mid and long term.

Production and sales of alcohol is a source of revenues and profits for companies engaged in manufacturing and sales of the commodity. Alcohol control policies aimed to reduce the supply are implying additional investment in better quality control, restructuring of retail outlets. Policies aimed to reduce demand are implying additional investment in labelling, improved controlling of sales to minors, additional training of staff. These spending are reducing profits of private companies with no likely gains in the future, thus may be considered as losses. Almost inevitable losses of producers and retailers of alcohol makes presentation of discussed policies as negative according to the algorithm of Pareto improvements (development that makes at least one individual better off without making any other individual worse off). Lobbing to prevent these losses is considered to be one of the main reasons why politicians are often reluctant to implement efficient alcohol controls. In case controls work and consumption of alcohol falls producers of alcohol are going to lose not just in the short term but in the long term. On the other hand, reduced demand for alcohol provides opportunity for consumers to shift saved resources to consumption of other goods and services thus to increase sales and profits in industries non-related to alcohol. Policy of alcohol control what regards profits of private companies (related and non-related to alcohol) is negative in short term and at least neutral in mid and long term.

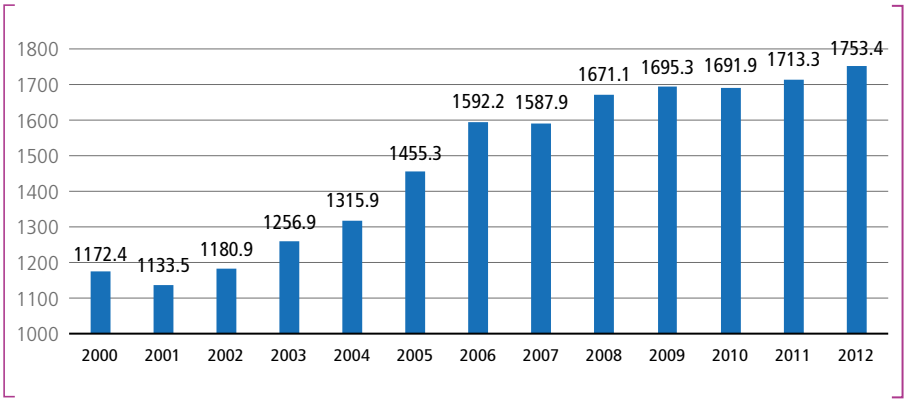
Employment in economy may slightly decline at the beginning of reform but will recover in mid-term as business will shift their attention towards production of goods non-related to alcohol. Taking in to account avoided losses of human capital caused by heavy drinking (absenteeism, deteriorating productivity because of weak mental and/or physical health) reduction of heavy drinking is leading to improvement of employment in long term.

GDP in a most simple way may be calculated as a sum of income by employees (wages) and employers (profits). According to provisional estimates radical measures of alcohol control may reduce employment in Lithuania by 2 thousand for up to 1-2 years thus reducing GDP by up to 50 million euro. Alcohol related avoidable deaths are estimated at around 3000 per year (most of people currently lost are males of working age). Society is going to recover (in terms of GDP) investments in to alcohol control in 2 years. This is the efficiency most of private investments even not dear to dream about.

Implementation of evidence based public health practices is a key in tackling challenges created by growth of productivity in industry

Growth of productivity in manufacturing provided opportunities to increase consumption of durable goods. Number of registered passenger cars almost doubled between years 2000 and 2012.

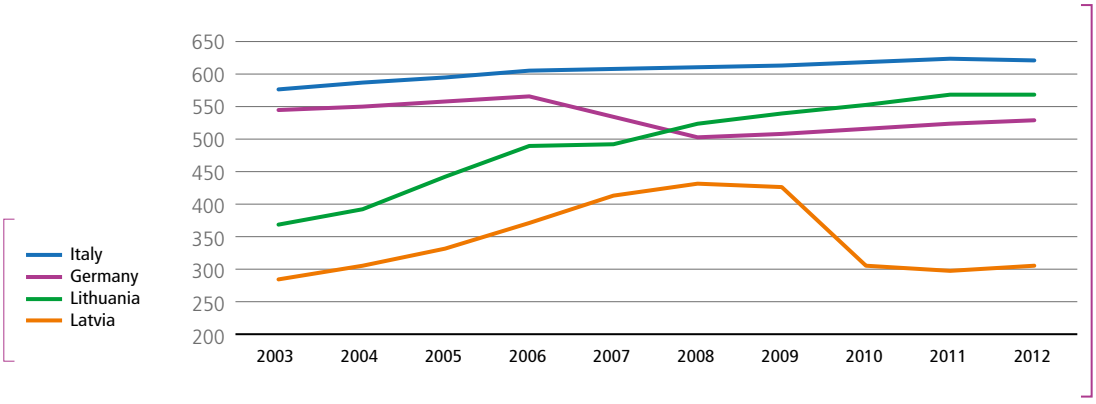
Figure 32. Passenger cars in Lithuania, thousand



Source: Statistics Lithuania

Rapid growth of car numbers has shifted Lithuania to the leading position (what regards cars per capita) in the EU. In year 2007 ratio of cars to population in Lithuania exceeded this of Germany.

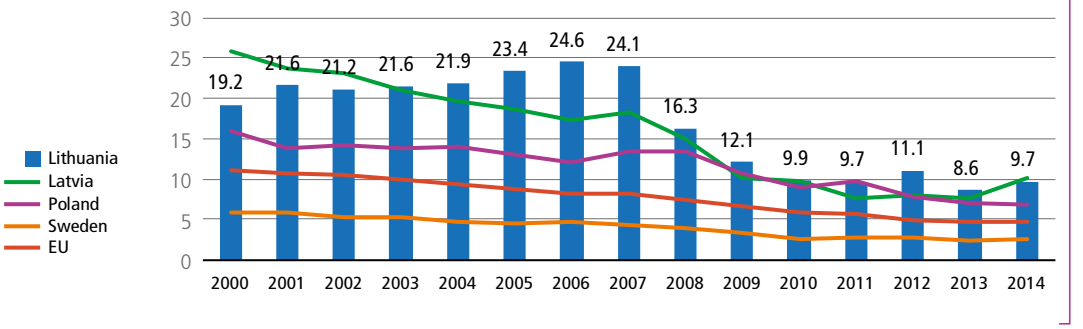
Figure 33. Passenger cars per 1000 inhabitants in selected EU countries



Source: Eurostat

Growth of cars with almost not existing of active policy of safety on roads had contributed to the growth of traffic accidents and related deaths. In years 2000-2007 Lithuania growing standardized death rates (SDR) related to traffic accidents in opposite to improvements recorded in most of European countries.

Figure 34. Mortality (SDR) in traffic accidents in selected EU countries, all ages, per 100000



Source: Eurostat

During the period of 2000-2006 Lithuania had not used an opportunity to introduce public health measures in transport. Figures of traffic accidents related deaths for the country of 3 million people calculated according to actual SDR for Lithuania and SDR Lithuania would have in case progress will be at the level of EU average are presented in the table.

Table 3. Traffic accidents in Lithuania. Lives lost because of inaction in public health (2000-2007)

	2000	2001	2002	2003	2004	2005	2006	2007	Total
Deaths, actual SDR	577	648	636	648	657	702	737	722	5327
Deaths with EU progress	577	559	550	514	485	458	431	427	4001
Lives lost	**0**	**89**	**86**	**134**	**173**	**244**	**305**	**295**	**1325**

At the end of 2007 most of good international practices of safety on roads (special policies for starting drivers, installation of safety speed bumps and round abounds, bigger fines) had been reflected in national policies. The reform has contributed to saving of more than 400 lives per year and more than 2700 lives during the period of 2008-2014.

Table 4. Traffic accidents in Lithuania. Lives saved because of action in public health (2007-2014)

	2007	2008	2009	2010	2011	2012	2013	2014	Total
Deaths with no public health action	722	722	722	722	722	722	722	722	5777
Deaths, actual SDR	722	488	363	297	292	332	257	291	3041
Lives saved	**0**	**234**	**359**	**425**	**431**	**391**	**465**	**431**	**2736**

Additional 600 lives may be saved during the period of 2017-2023 under assumption that progress in safety on roads will continue.

Peace is instrumental for economic development but it is also one of greatest public health projects

One of most constructive Ideas to create long-lasting peace was heralded in Shuman Declaration of year 1950. The declaration starts "World peace cannot be safeguarded without the making of creative efforts proportionate to the dangers which threaten it". The algorithm to achieve the peace has been outlined as common governance of heavy industry integration of markets for peace, productivity, improvement of living conditions of workers, federalization of Europe:

- The coming together of the nations of Europe requires the elimination of the age-old opposition of France and Germany.
- Franco-German production of coal and steel as a whole be placed under a common High Authority.
- The task with which this common High Authority will be charged will be that of securing in the shortest possible time the modernization of production and the improvement of its quality; the supply of coal and steel on identical terms to the French and German markets, as well as to the markets of other member countries; the development in common of exports to other countries; the equalization and improvement of the living conditions of workers in these industries.
- The movement of coal and steel between member countries will immediately be freed from all customs duty, and will not be affected by differential transport rates. Conditions will gradually be created which will spontaneously provide for the more rational distribution of production at the highest level of productivity.
- The solidarity in production thus established will make it plain that any war between France and Germany becomes not merely unthinkable, but materially impossible.
- The pooling of coal and steel production should immediately provide for the setting up of common foundations for economic development as a first step in the federation of Europe.

Developments after year 1950 have proven the creative potential of Shuman Declaration. The European Coal and Steel Community (ECSC) was formally established in 1951 by the Treaty of Paris and European Community (approaching 60th anniversary) in year 1957. Since 1950 Europe witnessed expansion of productivity in manufacturing providing opportunities to remarkable growth of wellbeing of Europeans.

On the other hand, even at the beginning of the European project it was clear that cooperation on coal and steel is a decisive point but a "limited" (as it was indicated in Shuman Declaration) one. The statistical figures specify that heavy industry lost its leading role in modern Europe. It looks like the legacy of Shuman Declaration what regards achieving long lasting peace is of most relevance today.

First half of the XX century witnessed WWI and WWII with most of casualties (about 60 million) concentrated in Europe. Since 1950 were no major military conflicts on European soil. Up to 200 thousand people have been lost during Balkan's and other regional conflicts. Peace after 1950 has saved up to 60 million

lives in Europe. Even if to consider that just 10 percent of the gain is because the European Union was created the result 8 times exceeds total employment in mining and manufacturing of all Euro area.

In 2012 EU was rewarded Nobel Peace prize. It was stated: "The Norwegian Nobel Committee wishes to focus on what it sees as the EU's most important result: the successful struggle for peace and reconciliation and for democracy and human rights. The stabilizing part played by the EU has helped to transform most of Europe from a continent of war to a continent of peace."

Long lasting peace in Europe is an example how the desire to save lives may change politics. Contemporary military confrontations (e.g., in Syria) are challenges European good practice may be used to deal with. It is unlikely that sectors producing steel and coal will play a decisive role in the contemporary politics as it was in the middle of XX century. What about a role for health and other sectors of tertiary/quaternary economy?

Interaction between social and health policy

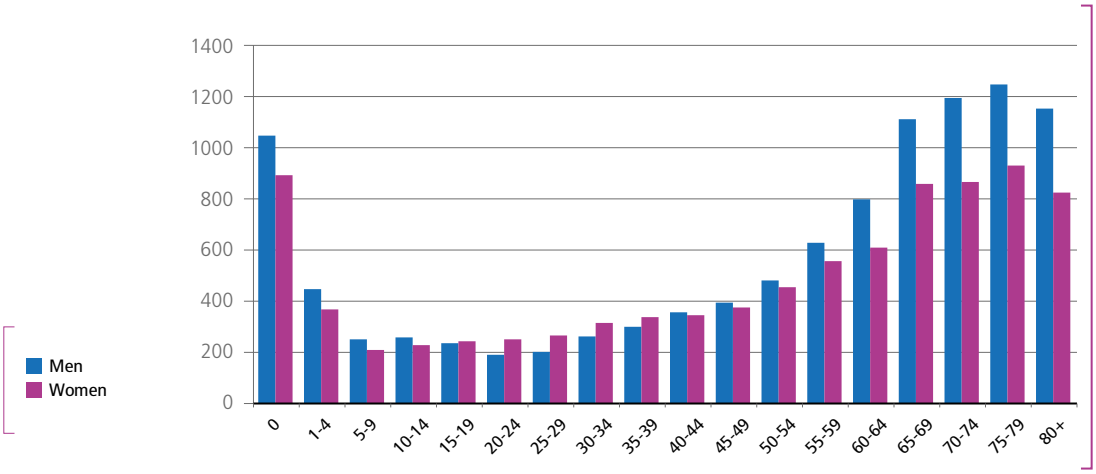
Preparation of Lithuanian National Health Strategy for 2014-2024 revealed impacts of social development on health outcomes (see Sveikatos sistemos reformų analizė. Galutinė ataskaita. (Health system reform analysis, Final report), Vilnius 2012):

- Unemployment is positively correlated with deterioration of mental health including suicidal behaviour.
- Poverty is leading to deterioration of consumption patterns including reduced affordability of medical services thus contributing to poor health.
- Social exclusion may contribute to growth of violence thus growth violence related injuries including fatal ones.
- Employment provides monetary income for households to purchase health services and goods as well as tax contributions to finance public health schemes.

Developments in health care are contributing to social development:

- Solidarity in health is leading to redistribution of resources from healthy to sick thus reducing social inequality/poverty in the country.
- Benefits in kind provided by health insurance and other publicly financed health programs are supplementing income gained by population (especially elderly).
- Gains in health are leading to better employment opportunities as well as growth of income of population of working age.

Figure 35. Lithuanian health expenditures from public sources per capita by age groups, year 2013, euro



Source: HEDIC

Revision of national health accounts provides an opportunity to collect data on health expenditures by age groups. Figure 35 shows that people of working age are using publicly financed health services and goods for about 300 euro per year in comparison to people in category 65+ and infants with annual consumption of about 1000 euro. Taking in to account that health insurance contributions as well as most of taxes are paid by working age population, health system clearly contributes to reduction of poverty.

Apart of dimension of age groups poverty also has intergenerational aspect. Sickness is distributed unevenly in the particular age group. Longitude study (years 1994-2011) of 600 people of working age revealed that 30 percent of cohort had annual sick leave of 1-2 days. 11 percent of cohort had annual; sick leave of 10 or more days (see: Socialinis draudimas Lietuvoje, Vilnius, 2014). The study is indicating to the likelihood that 10 percent of relatively unhealthy people in working age are using up to 50 percent of public health resources allocated to this age group. National statics for intergenerational differences in health are not available.

Public health expenditures is an important part of private consumption

Alternative to consumption of medical products financed by public resources is private financing. Thus, it is correct to talk about consumption of publicly financed products as income (benefits in kind). For the working population 200-300 euro of public health products per year is on average about 4 percent in comparison to income generated by salary. For the elderly the ratio of public health products to old age pension is about 35 percent.

Table 5. Lithuanian health expenditures from public sources per capita by age groups, 2013, euro

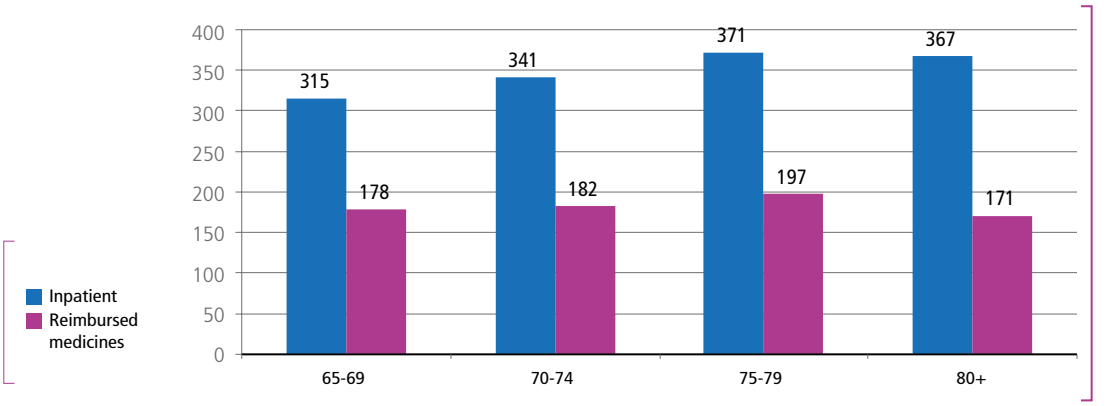
Years	Health expenditures from public sources per capita by age groups, euro	Ratio of public health expenditures in kind to average social insurance old age pension, percent
60-64	704	24.64
65-69	987	34.55
70-74	1031	36.09
75-79	1090	38.16
80+	989	34.64

Source: HEDIC

It is likely that 20 percent of elderly with most severe health problems utilize 100 or more percent of public health expenditures in kind if compared with average social insurance old age pension.

Most of health benefits in kind used by elderly are inpatient services and medicines. Services provided by nursing homes as well as rehabilitation are not included in the scope of inpatient services.

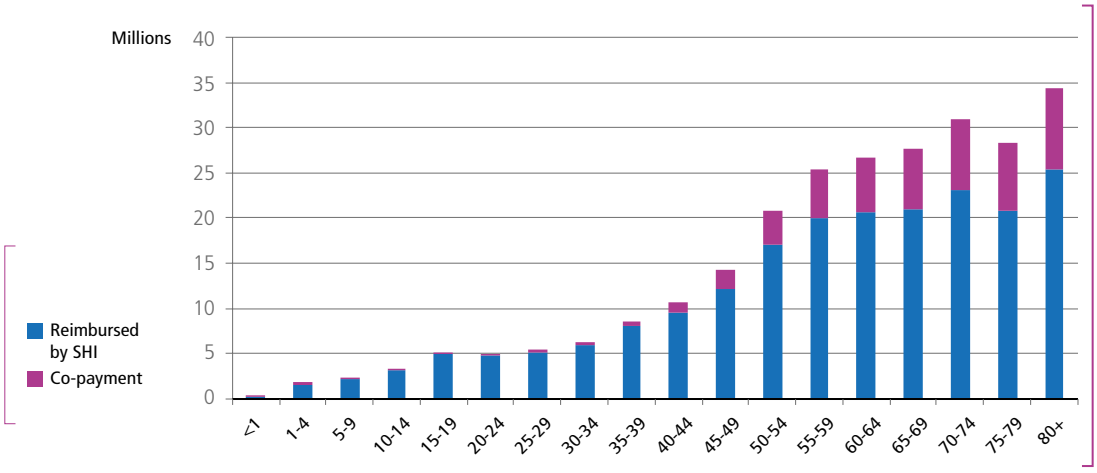
Figure 36. Lithuanian health expenditures from Social Health Insurance Fund per capita by age groups, year 2013, euro



Source: HEDIC

Statistics of SHI provides opportunity to study publicly financed consumption of medicines by age as well as co-payment.

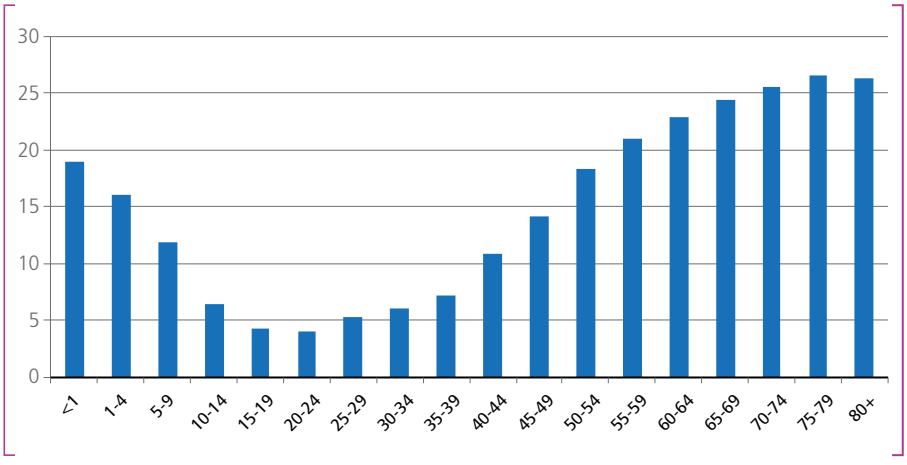
Figure 37. Total consumption of medicines reimbursed by SHI by age groups, 2014, million euro



Source: HEDIC

The chart clearly indicates towards solidarity between young and senior. On the other hand, seniors are faced with relatively strong financial pressure what regards co-payments.

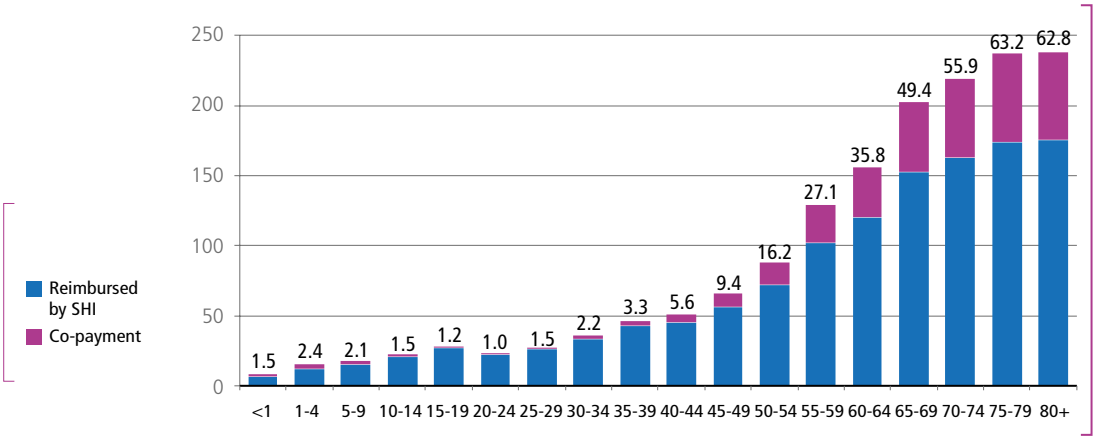
Figure 38. Co-payments in Lithuanian social health insurance, 2014, percent in retail prices



Source: HEDIC

Remuneration of medicines and co-payments per capita is presented in the figure 39.

Figure 39. Consumption of medicines reimbursed by SHI per capita by age groups, 2014, euro



Source: HEDIC

Figure shows that annual co-payments for seniors on average are about 60 euro per year or 5 euro per month.

Social protection of elderly: more generous reimbursement of medicines versus bigger pensions

There are intense debates in Lithuania how to improve quality of life for socially vulnerable groups. Under one of proposals the monthly old age pension is going to be increased by 40 euro in year 2017. The alternative from public health perspective would be to increase monthly old age pension is going to be increased by 35 euro and to allocate monthly 5 euro (annually 60 euro) for coverage of co-payments. Both alternatives are generating the same demand for budgetary resources and would increase average consumption (total of pension and health benefits in kind) of pensioners by the same amount but the public health approach would generate additional welfare by mainly serving sick (most vulnerable) pensioners.

Improved welfare of working age population: health saving accounts versus bigger real wages

Reduction of personal income taxes is considered a traditional a way to increase wellbeing of working population. Application of this policy In Lithuania in 2000-2009 resulted in a decrease of personal income tax rate for majority of employees from 33 percent to 15 percent.

Since 2015 an increase of non-taxable minimal income became the main policy of improved wellbeing in Lithuania. It is foreseen for year 2017 to increase non-taxable minimal income from 200 euro per month to 315 euro per month. Such an increase will provide lower income families with additional 17.25 euro of disposable income per month or 207 euro annually.

Under assumption that structure of consumption will be the same additional income will be used for purchasing more health-related products as well as

more food, closing, alcohol. According to Department of Statistics Lithuanian households are using about 150 euro per year or up to 5 percent of their disposable income for health products. 5 percent from of the extra 207 euro of disposable income will constitute 10.3 euro annually or less than 7 percent of current private health expenditure. It is likely that bigger real wages apart of contributing for health expenditures will add at least 10 euro or additional 1 litter of vodka to consumer basket thus undermining positive health effects of foreseen tax reform.

Government has an opportunity to link strongly tax cuts with enhancement of health by introducing medical saving accounts. Let's assume that 50 percent of tax cuts (about 100 euro per year) are transferred to personal health saving accounts of employees with an option to use money in these accounts to pay for health services and goods not reimbursed by social health insurance as well as to cover co-payments for services and goods. Such a move would contribute additionally up to 100 million euro for health with a boost for health because of more health spending and reduced risks of increases in alcohol consumption.

Health saving accounts are widely used in United States and are the main form of health financing in Singapore. In case Lithuania, would undertake political decision to introduce the system it has to be stressed that Lithuanian Government had developed a methodology how to introduce health saving accounts in 2008-2009. Basic provisions of this methodology are as follows:

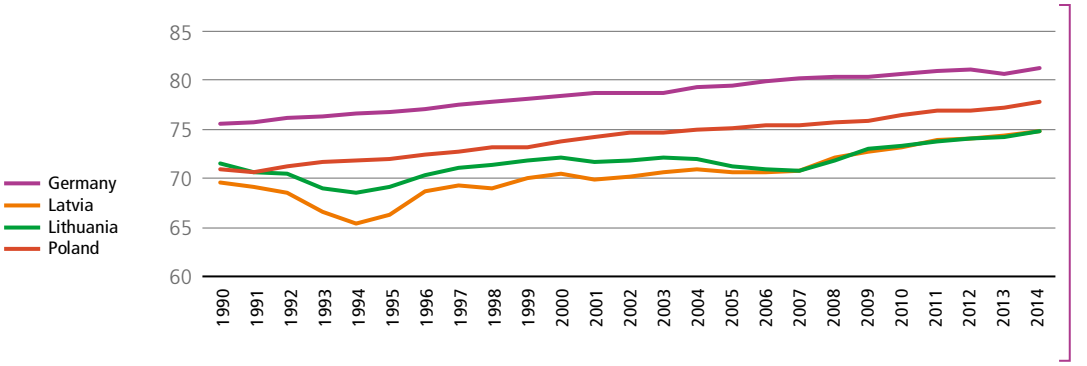
- Money generated by tax reduction is transferred to personal health accounts of employees.
- Usage of money from the scheme has to be restricted according to approved criteria just for medical goods and services.
- Debit cards are going to be used for payments. Experience accumulated by national industry has to be used to design most efficient scheme of transactions management.
- Expenses from the card are limited by the money transferred to the account
- Transfers of money to the account should be quarterly or semi-annual.
- Money saved on the account as for 31st of December should be transferred for the next year.
- Under assumption that an individual not family is card owner purchasing of medical goods prescribed to family members should be allowed.

Better health is a determinant of higher employment, less expenditures for disability and sick leave

During first years of independence creating of political structures, basics of market economy, fighting crime, unemployment, poverty were priorities of socio-economic development in Lithuania. Disrespect to health matters was reflected in stagnant of even deteriorating health status of population. In year 2007 life expectancy at birth (one of most integral indicators of health outcomes) was below the figure for year 1990. Decline in health resulted in decline of population of working age, thus labour force and employment.

Statistics show that sustainable growth of health indicators in Lithuania as well as in neighbouring Latvia started just in year 2007.

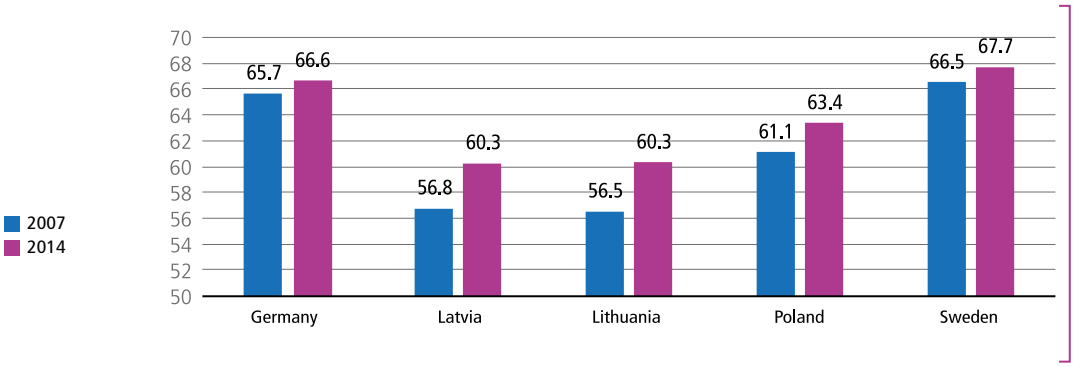
Figure 40. Life expectancy at birth (years) in selected EU countries



Source: WHO HFA database

Period of 2007-2014 witnessed improvement not just in life expectancy at birth. Statistics of working population starts from 15 years of age.

Figure 41. Life expectancy at age 15 (years) in selected EU countries, years



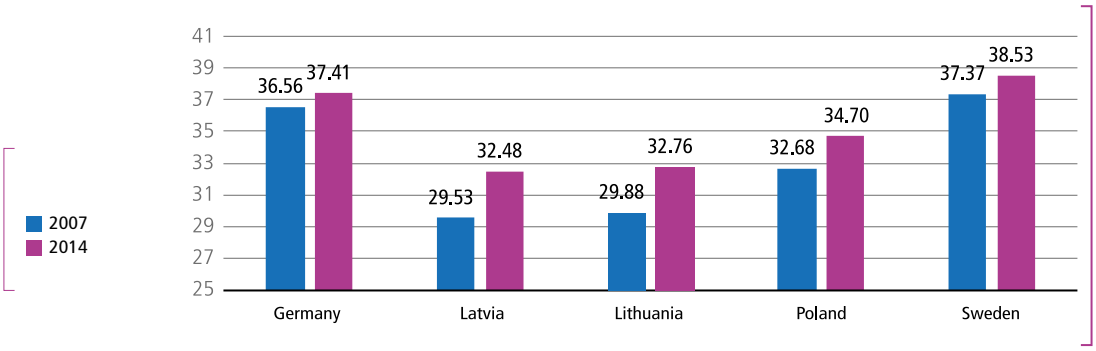
Source: WHO HFA database

Figure 41 shows that during the period 2007-2014 life expectancy at age 15 in Lithuania has increased by 3.8 years in comparison to growth of 3.5 years in Latvia, 2.3 in Poland, 1.2 in Sweden and 1 year in Germany. From epidemiological point of view we may talk about health in Baltic States coming closer to this of neighbours.

From the perspective of social policy growing life expectancy means growing numbers of people age15+, thus potential labour force and employment. Ceteris paribus, improvement in health status during last 7 years has increased number of people in age 15+ by up to 15 thousand people.

Most of population in age group of 15-20 are studying and just marginally involved in labour force. Life expectancy at age 45 provides additional information important for analysis of labour supply.

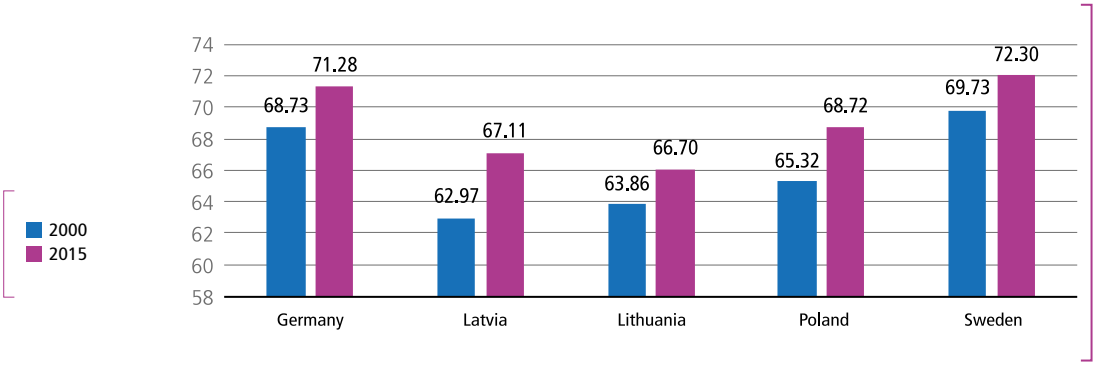
Figure 42. Life expectancy at age 45 (years) in selected EU countries



Source: WHO HFA database

Apart of longevity the life with no disabilities is important for the labour market. Annual data on disability free life expectancy is not available. Figures of studies conducted by WHO for years 2000 and 2015 are provided in the figure 43.

Figure 43. Disability adjusted life expectancy at birth (years) in selected EU countries

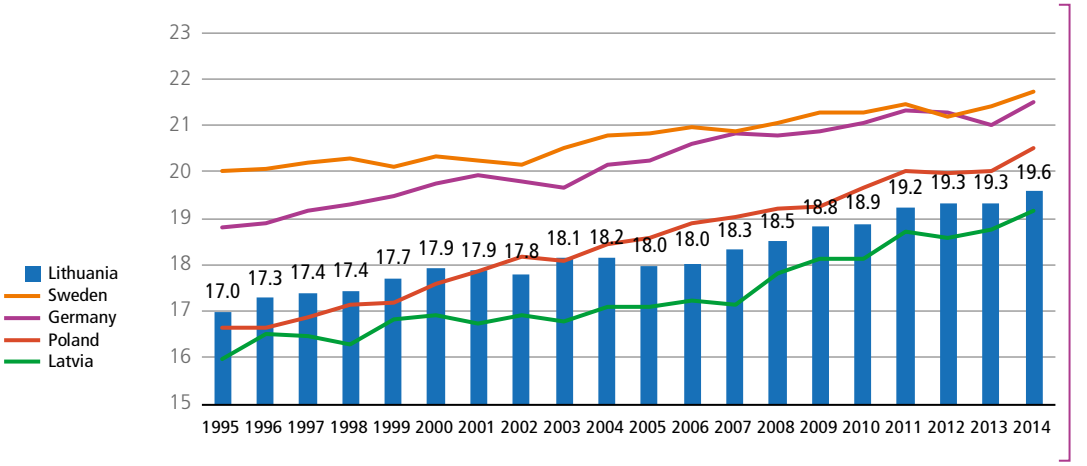


Source: World Health Report

Lithuanian gains during 2000-2015 in disability adjusted years was 2.2 years. At the same period gains in life expectancy at 15 were 2.1 years. Combining figures from gains in life years and disability adjusted life years it is likely that those additional 15 thousand people calculated as a potential gain for the labour market are healthy and fit for work.

The interaction between gains in health and gains in labour market as well as social insurance system has not just theoretical but empirical evidence. Contemporary political thinking is providing parallels between longevity and retirement age. During last 20 years sustainable growth of life expectancy was observed between Lithuanian women at age 65. The Group was one of very few population groups with Life expectancy growing at the same rate as in Germany and faster in comparison to this in Sweden.

Figure 44. Life expectancy at age 65 (years) in selected EU countries, females



Source: WHO HFA database

From the epidemiological point of view data on progress in health of women provided important arguments in favour of positive health outcomes related to progress in quality of health services (for most age groups of men this positive influence likely has been undermined by deteriorating life styles). From the perspective of social policy growth in health of senior people have contributed to increase of retirement age. Retirement age for women has reached 60 years in 2006. Since 2011 the retirement age has started to increase by 1 year per 3 years in order to reach 65 in 2026. The reform provides savings for social insurance as well as boost to the labour supply.

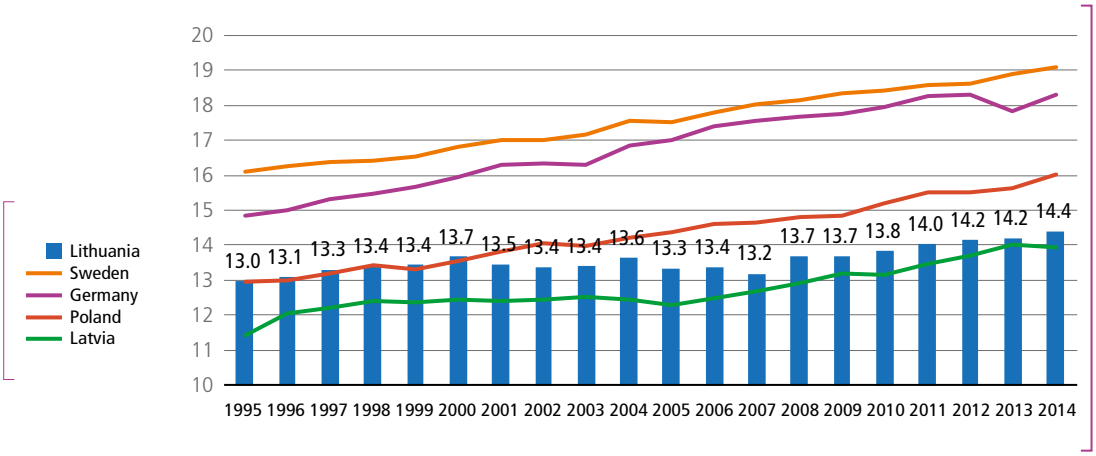
Year	Retirement age for women
2011	60
2014	61
2017	62
2020	63
2023	64
2026	65

Source: Ministry of Social Security and Labour

According to the vital statistics (see *figure 44* life expectancy for women at 65 was 18 years in 2006 thus women on average lived after retirement at least 23 years. In year 2014 retirement age for women was 61 and life expectancy 18.6, thus women on average lived after retirement at least 23,6 years. Retirement age for women will reach 65 in 2026 (in 12 years from 2014). German statistics show that during 12 years' life expectancy for the group under scrutiny increased by 1.8 years. Under assumption that in Lithuania improvements are going to be as in Germany life expectancy as well as the average life of women after retirement in year 2026 will be 21.4 years.

To sum up: since 2006 to 2026 retirement age for women is going to increase by 5 and life expectancy at age of 65 by 3.4 years. Gains in health will compensate about 65 percent of losses in leisure time for women. From the perspective of the labour market it is correct to say that about 65 percent of gains in labour force generated by the growth of retirement age are going to be generated by improvements in health. Taking into account that numbers of population in age groups of 25-60 in Lithuania are rapidly shrinking because of demographic waves and emigration, the growth of retirement age strengthened by gains in health during the incoming decade will be the major factor to assure stability of labour force in Lithuania.

Figure 45. Life expectancy at age 65 (years) in selected EU countries, males



Source: WHO HFA database

Retirement age for men has reached 62.6 years in 2006. Since 2011 the retirement age has started to increase by 0.6 year per 3 years in order to reach 65 in 2026. Gains in men's health are less obvious in Lithuania. On the other hand, growth of retirement age for men is less fast in comparison to this of women. Mathematics of interplay between gains in health, wellbeing of elderly and labour supply for the period 2006-2014 an approximately the same for men as it was for women. In case Lithuania will succeed during period of 2014-2026 to improve health of men at the rate it is achieved by Germany (by about 2.5 years) in 2026 men will enjoy retirement on average for 15.9 years or about the same figure as in 2006. All growth of retirement age for men may be covered by gains in health.

3 Lithuanian Health Strategy

In the middle of 2014 the Parliament of Lithuanian Republic (Seimas) confirmed „Lithuania's healthcare program for the years 2014-2025". The document, which was in 2016 renamed „ Lithuanian Health Strategy 2014-2025" (later strategy) was prepared carrying out a Healthcare System Law which states that the long-term health building planning document is Lithuania's healthcare strategy, which has to be realised at the national and municipality levels. Article 46 of this law „Healthcare activity planning "states:

„1. The Lithuanian Health Strategy which contains health objectives, indicators of health and strategies to achieve these indicators has to be submitted by the Cabinet of Ministers and approved by the Parliament (Seimas).

2. The Cabinet of Ministers, ministries and other institutions subordinated to the Cabinet of Ministers are responsible for the implementation of objectives foreseen in the Lithuanian Health Strategy".

The strategy confirmed in 2014 continues the tradition of long term health planning which began in 1998. The strategy project confirmed in 2014 was developed by the expert group of the Ministry of Health in the beginning of 2012. This project which was developed on the basis of using statistical data from the year 1997 to 2010 foresaw health development goals for the years 2015 and 2020.

Two years have passed since „Lithuanian Health Strategy 2014-2025" has been confirmed and available statistical data for the years 2011-2015 has prompted to perform an evaluation of the implemented Lithuania's health strategy. The document in the text confirmed by the Seimas in 1998 is called the Lithuanian Health Programme (LHP), the document approved by the Seimas in 2014 is called the Lithuanian health Strategy (LHS) and the project of this document prepared in 2012 is called the „LHS project".

The review seeks to compare LHP and LHS objective ambitiousness as well as determine the results of LHS implementation. Acknowledging that statistical data on the execution of LHS can only be accessed from mid-2016, the LHS progress evaluation was carried out measuring actual data compliance with not only LHP, but its project objectives as well. Both LHP and LHS foresee instruments for improving health and raising health level objectives, mostly measured by mortality indicators. Indicators for expected future average life expectancy and the decreased mortality rate due to lives saved are analysed in the chapter.

The ambitiousness of LHP and LHS

In the LHP it was foreseen that during the implementation of the program in 1998-2010 the expected average life expectancy (ALE) will increase to 73 years. Looking back at the fact that in 1997 the future life expectancy was 71.08 years, the main aim for the LHP was to increase the country residents' life expectancy by 1.92

years in 13 years or on average by 0.15 every year. For determining LHP provided ALE quantitative compliance with the international practice see table 6.

Table 6. Life expectancy at birth increase in 13 years from the year when it was 71.2

	Ireland	Czech Republic	Poland	Portugal	Finland	Lithuania LHP
ALE increase in years	2.5	3.8	3.9	3.4	3.4	1.9

Source: Analysis of Health Systems Reforms. Development of the draft of Lithuanian Health Programme (Strategy). Vilnius, 2012

The statistics shows that in 13 years ALE grew from 2.45 years (Ireland) to 3.92 (Poland). The arithmetical average of the reference countries for ALE increase in 13 years was 3.35 years.

Summarizing the international comparison results it can be said that the LHP objective to increase ALE was substantially more modest than other EU state actual results or not ambitious enough.

While preparing the LHS project, health strengthening objectives were projected after EU countries who had reached the indicators for an ALE of 73 years more than 10 years ago. In 10 years from the period when the country reached an ALE of 73 years, the reference countries ALE grew by 2.5 years or to 75.5 years. Aiming to reduce the difference between Lithuanian residents ALE and EU states, the LHS project included an aim to increase Lithuania's ALE by a bit more than 2.5 years in 10 years, to reach a 76 year ALE by 2020. This extended aim of the LHS project is ambitious and meets the leading health level growth of EU states.

Consideration for the LHS project by the Lithuanian Government took over two years. During the considerations the program period was changed from that of 2010-2020 to 2014-2025. The ambitiousness of the LHS expressed as the average yearly ALE increase remained the same as in the LHS project.

Data allowing to compare the ambitiousness of the LHP and LHS are presented in table 7.

Table 7. Annual increase of life expectancy (ALE)

	Period*	Projected ALE increase in years	Projected ALE increase in a year
LHP	1997-2010. 13 years of program	1.92	0.15
LHS project	2010-2020. 10 years of program	2.81	0.28
Confirmed LHS	2013-2025. 12 years of program	3.48	0.29

* The starting year of the period is a period for which the statistical data was known when creating or approving the program/strategy

Lessons of LHP implementation

LHP was analysed in depth in the years 2011-2012. The results of this analysis is presented in table 8.

Table 8. Objectives and achieved results of the 1998-2010 Lithuanian healthcare program

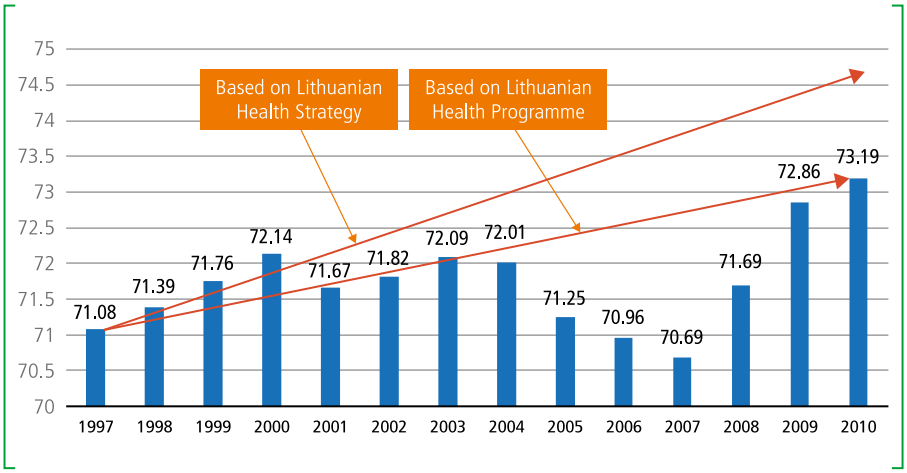
Objective	Result, 2009-2010 yrs.
Lengthen the average life expectancy to 73 years	Reached (73.45 yrs.)
Decrease infant mortality rate by 30 percent	Reached (a change in index of almost twice the planned outcome)
Decrease morbidity for tuberculosis by 30 percent	Reached
Decrease mortality from accidents and injuries by 30 percent	Almost reached (decreased by 25 percent)
Decrease the mortality rate for those under 65 from malignant tumours by 15 percent	Almost reached (decreased by 13 percent)
Decrease the mortality rate for those under 65 from ischemic heart disease by 15 percent	Almost reached (decreased by 11.8 percent)
Decrease the lung cancer mortality rate for men by 15 percent	Almost reached (decreased by 13 percent)
Decrease the mortality rate for those under 65 from heart and vascular disease by 15 percent	Not reached (only 5.6 percent decrease)
Stabalize the incidence of mental illness until 2005	Not reached (13 percent increase)
Decrease the suicide rate to 25 for every 100000 residents	Not reached (only decreased to 31.5 for every 100000 residents)
Decrease the mortality rate for breast cancer by 15 percent	Not reached (only 5.8 percent decrease)
Decrease the morbidity rate for cervical cancer by 15 percent	Not reached

Source: Sveikatos sistemos reformų analizė. Galutinė ataskaita (Health system reform analysis, Final report). Vilnius, 2012

Traffic light colours (if the goal was reached and exceeded – green; if in experts opinion it was almost reached – yellow; if not reached – red) are used to visualize results.

The aggregated achieved results by year of the first health strategy are displayed in the first figure. The average life expectancy dynamics integrate mortality data from all diseases.

Figure 46. Average life expectancy at birth (years) in Lithuania 1997-2010



Source: Statistics Lithuania, SEC

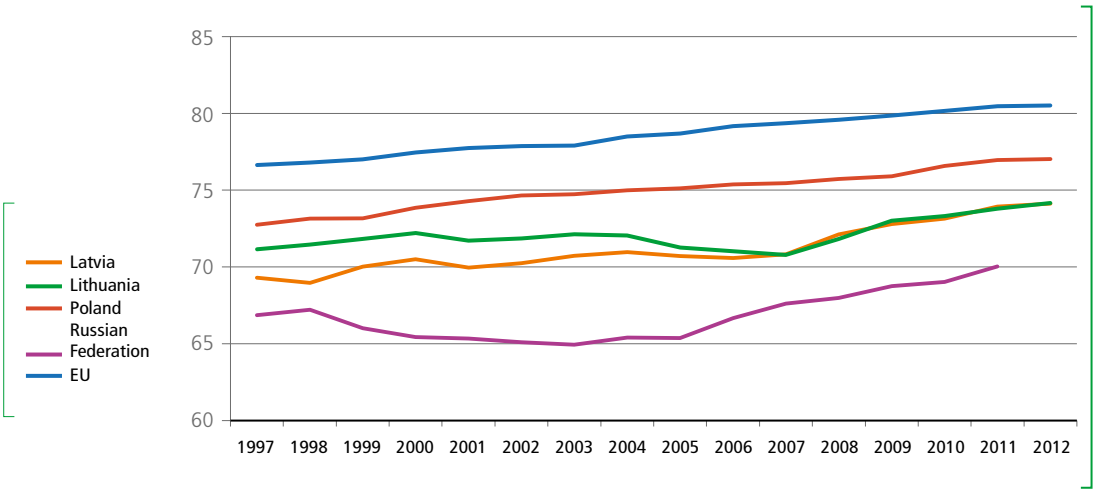
It is worth noting that in the ALE figure, the ALE value in the year 2010 is lower than in table 8. The difference came about due to the decrease in Lithuania's population as recorded during the update to the Lithuanian Population Census. This decrease (in the absence of change in mortality numbers) corrected the ALE.

Figure 46 shows, that formally the goal to increase the ALE to 73 years was met. However, the statistics show inconsistent growth in health levels characterized by steep falls in mortality in the years 1998-2000 and 2008-2010, ALE stagnation in years 2001-2004 and ALE decrease in the years 2005-2007.

In the first part of the review LHP goals were defined as moderately ambitious. Figure 46 reflects ALE dynamics which should have been seen in the years 1997-2010 if LHP was as ambitious as LHS. If all other conditions remain the same, a more ambitious program will not be implemented.

The question whether more ambitious planning would have changed these ''other conditions", if higher goals were decided on results, does not have a statistically reliable answer. On the other hand, the statistical fact that Lithuania's ALE in the years 1997-2010 grew the least out of EU countries, that only Lithuania in the period concerned had a fixed rate of falling ALE. From 2007 to 2015 Lithuania was named (together with Latvia) as the state having the lowest ALE within the European Union. It is a small consolation that in terms of ALE Lithuania is beating the bordering country of Russia.

Figure 47. Life expectancy at birth (years) dynamics in selected European countries heaving borders with Lithuania, 1997-2013



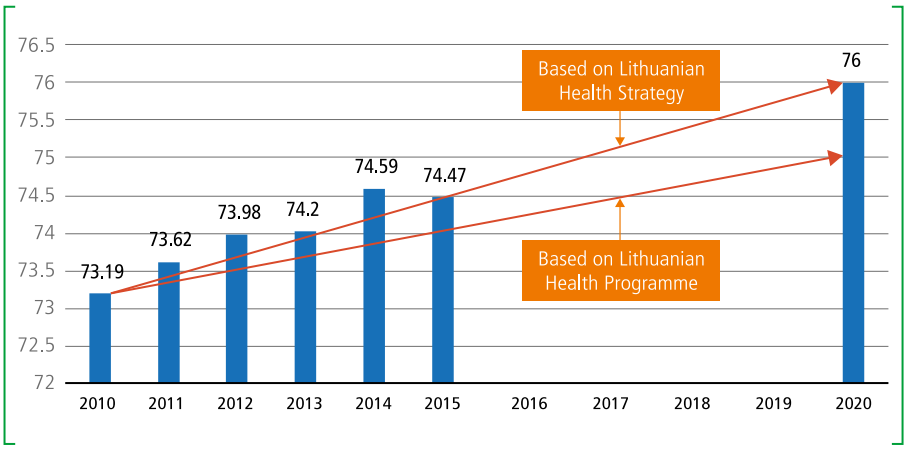
Source: WHO HFA database

First results of LHS implementation

Implementation of LHS project goals regarding general mortality indicators

Given that the statistical data on the implementation of the LHS is accessible from only the middle of 2016, the LHS effectiveness evaluation is made, first of all, measuring actual data compliance with LHP goals, which when aggregated lead to the goal of securing a 76 year average life expectancy by the year 2020. The base data for 2010 as well as the following 5 years is displayed in figure 48.

Figure 48. Average life expectancy at birth (years) in Lithuania in 2010-2020



Source: Statistics Lithuania, SEC

ALE dynamics predisposition in the years 2010-2015 is quite optimistic. Lithuania has not only taken on an ambitious goal that is in correspondence with progressive European practice, but is also successfully implementing it:

- In 2015 the ALE of Lithuania was 1.3 years longer than in 2010. In comparison, over the first 5 years of LHP implementation (1997-2002) the ALE grew by 0.7 years.
- Each year of the period 2010-2014 is characterised by positive ALE dynamics. The first hardships of the LHP implementation showed themselves in 2001, during which the ALE fell by almost 0.5 years.

On the other hand, in 2015, when the ALE fell by 0.22 years and indicator's value for the first time since 2010 dropped below the trend, which would secure an ALE of 76 years in 2020, the results show that the ambitious national goal formulation, as important as it might be, does not guaranty sustainable growth in the level of residents health.

Table 9. Lives saved in the period 2011-2015 based on changes in standardised mortality

	Standardized mortality indicator 100000 residents	Deaths	Deaths according to SDR of year 2010	Lives saved
2010	1606.5	49758	49758	0
2011	1539.5	46618	48647	2029
2012	1520.4	45426	47999	2572
2013	1524.4	45087	47515	2428
2014	1465.4	42971	47108	4138
2015	1507.5	43792	46667	2876
Total		**273651**	**287694**	**14043**

Source: Statistics Lithuania, SEC

Implementation of goals foreseen in the LHS project in relation to specific mortality indicators

Goals for lowering mortality rate from concrete causes are an integrate part of the LHS. Goals for 2015 are outlined in the LHS project prepared in the beginning of 2012. These goals are formulated as lives which will be saved due to lowered mortality rates (number of lives saved based on non-standardised mortality indicators). Statistics from 2015 allows the assessment of deviation from these goals. Actual data compliance with LHS project goals from 2010-2015 are outlined in table 10.

Table 10. Lives saved in Lithuania 2011-2015. Main causes of death

	LHS goal for lives saved in the years 2011-2015	Lives saved in the years 2011-2015
Circulatory system diseases	3835	2407
External causes of death	2536	2685
Malignant neoplasms	892	343
Digestive system diseases	456	540
Infectious and parasitic diseases	233	-795
Total	**7952**	**4529**

Source: Institute of Hygiene, SEC

Aiming to more accurately reflect the results, traffic light colours are supplemented by shades (if the goal is reached and exceeded – bright green; if the goal is reached over 50 percent – light green, if the goal is reached between 10 and 50 percent – yellow; if the goal is reached less than 10 percent – light red; if actual results show a worsening situation compared to 2010 – bright red). All evaluations are statistical. Only a thorough analysis allows to answer the question of how much the bright green (red) colour is influenced by the good (bad) functioning of the health system, how much on unambitious (overly ambitious) planning, medical statistics changes, actions independent of the healthcare system.

It is noted that in the 2011-2015 year period the number of lives saved in tables 9 and 10 do not match up. The main reason for this inconsistency is that preparing the LHS both youth and elderly people's lives are treated equally, but when calculating SDR, a life saved of a young person is considered more significant. In the 2011-2015 year period youth health improved relatively faster than elderly health. Another reason for the inconsistency is that in table 10 counted deaths are due to reasons mentioned in the LHS. In total, during the years 2011-2015 5086 less people died than if the death rate was as in 2010.

The economic value of lives saved in the years 2011-2015 is 1749 million euro. The calculation is made multiplying the 5086 lives saved by the statistical life value, which according to the 2016 declared estimation by the Ministry of Finance is 343927 euro.

Table 11 attests the information displayed in figure 48 regarding the fact that Lithuanian residents' health is gradually improving and compliments the information by showing that mortality due to different diseases changes unevenly. Mortality due to external causes and digestive system diseases is decreasing faster than it was projected when preparing the LHS. Limiting the negative effect of circulatory system diseases as well as oncological diseases on Lithuanian resident's health is in going worse than predicted.

There are areas in which it is likely that the situation in 2015 was worse than in 2010. Especially worrying is the growing death rate from infectious and parasitic diseases being recorded by statisticians. In 2010 the former cause of death claimed 481 people and 735 in 2015.

The fact that due to improved healthcare in 2011-2015 in Lithuania, over 4500 deaths were avoided shows that the expenses for health pay off and these expenses are an investment in the Lithuanian nation, Lithuania's economy.

While preparing the LHS it was stated that out of European nations Lithuania distinguishes itself by its high mortality rate from external causes and that this area contains the second most significant (after circulatory system disease) reduction in number of deaths from all age groups and first in significant number of deaths reduction of working age people reserves. Actual data from 2010-2015 on mortality from external causes compared to LHS project goals are reflected in table 11.

Table 11. Lives saved in Lithuania 2011-2015. External causes of death

	LHS goal for lives saved in 2011-2020	Lives saved in 2011-2015
Intentional injuries (suicide)	2642	234
Accidental drowning	1075	551
Transport accidents	722	158
Alcohol poisoning and its effects	1440	125
Effects of natural cold (freezing)	2535	635
Total lives saved	**8414**	**1703**

Source: Statistics Lithuania, SEC

Aiming to more accurately reflect the results traffic light colours are supplemented by shades (if the 10 year goal is more than 50 percent achieved – bright green; if 25-50 percent achieved – light green; if 10-25 percent achieved – yellow; if below 10 percent is achieved – light red).

Actual data shows that in recent years Lithuania was able to lower mortality from all examined external causes of death. More than 1700 lives saved is a solid contribution to the health of the countries residents. On the other hand, the dominating yellow colour in table 11 shows that so far not all reserves for health care improvement are used. It is likely that the health improvements in Lithuania are too slow to free itself from the dishonourable position as the outlying country for external causes of death.

Table 12. Deaths due to external causes 2010-2015

	2010	2012	2013	2014	2015
Intentional injuries (suicide)	1018	927	1085	930	896
Accidental drowning	319	239	198	229	146
Transport accidents	372	392	316	325	307
Alcohol poisoning and its effects	310	268	263	242	253
Effects of natural cold (freezing)	389	331	295	233	167
Total deaths	**2408**	**2150**	**2157**	**1959**	**1769**

Source: Statistics Lithuania, SEC

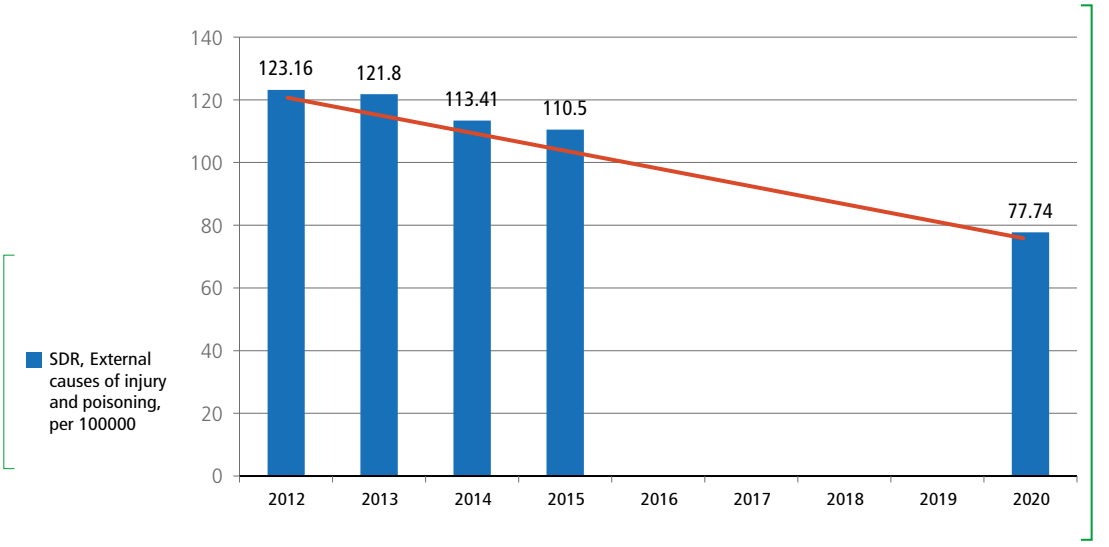
Table 12 displays absolute values of deaths due to external causes in Lithuania which shows a persistent scope of the problem as well as annual mortality fluctuations (a decreasing tendency was not upheld for suicides in 2013, traffic accidents – 2012 and 2014, deaths due to effects of alcohol – 2015). The number of deaths by freezing has decreased each year, but compared to other EU countries remains very high. To reach the level of neighbouring Poland, the number of deaths from freezing needs to be lower than 40.

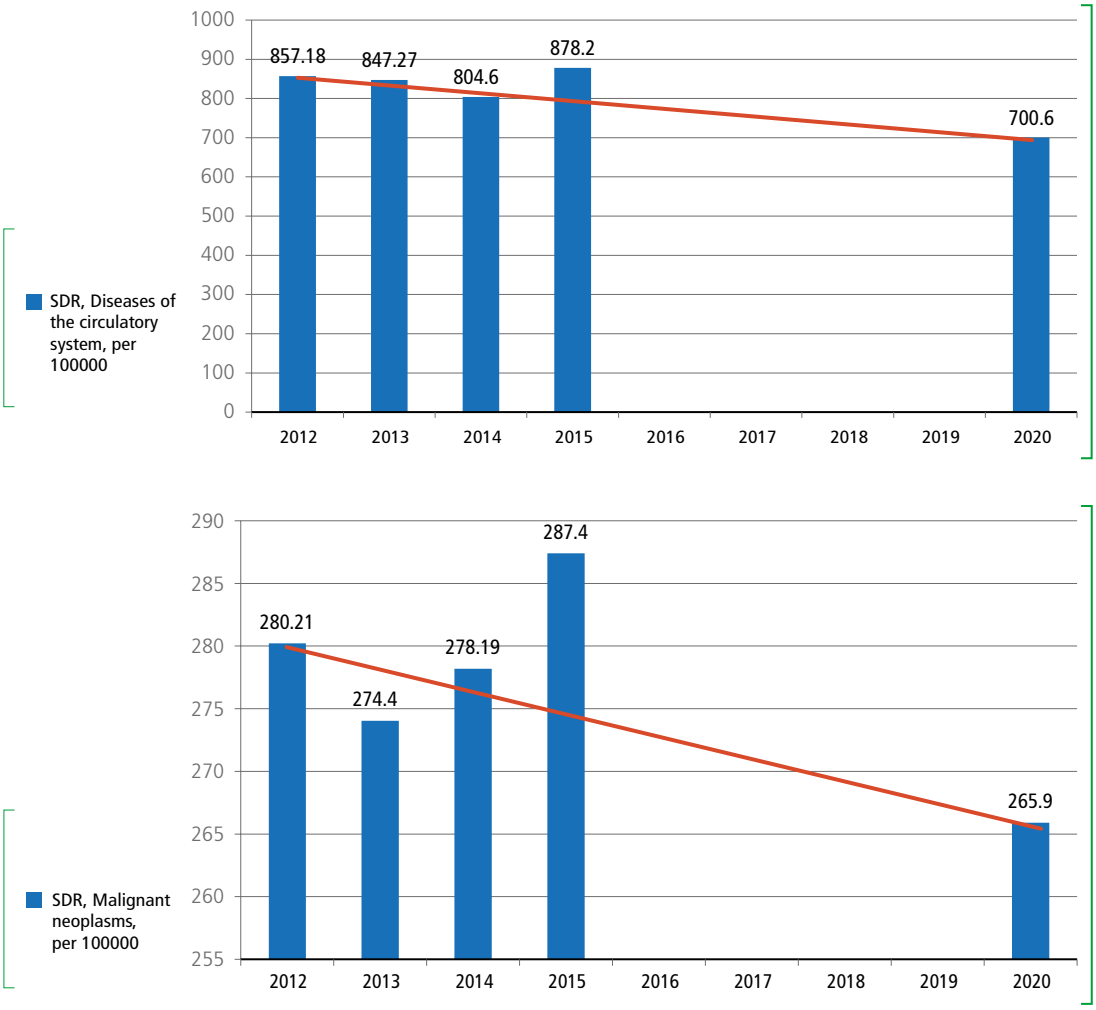
Final edition of LHS

When considering the LHS project which was prepared in the beginning of 2012 there were no foreseen changes in the predicted health dynamics by the Government and Seimas, but there was a change in the document structure and the way goals are formulated based on mortality indicators. Most goals in the project were formulated in absolute numbers of lives saved (tables 11-12). In the final draft of the LHS most goals were formulated as aiming for a decrease in standardized mortality (counted for 100000 residents) due to the main causes of death. Statistical data from the first calendar year of LHS implementation (2015) has been supplemented by figures from the years 2012-2014.

LHS directly outlines decreased standardized mortality goals for circulatory system diseases, deaths from external causes, malignant tumours, and suicide. Figures 49-51 as well as table 13 show the first results of implementing these goals.

Figure 49-51. Standardized mortality dynamics corresponding to Lithuanian Health Strategy goals





Source: Statistics Lithuania, SEC

Table 13. Standardised mortality dynamics corresponding to LHS goals*

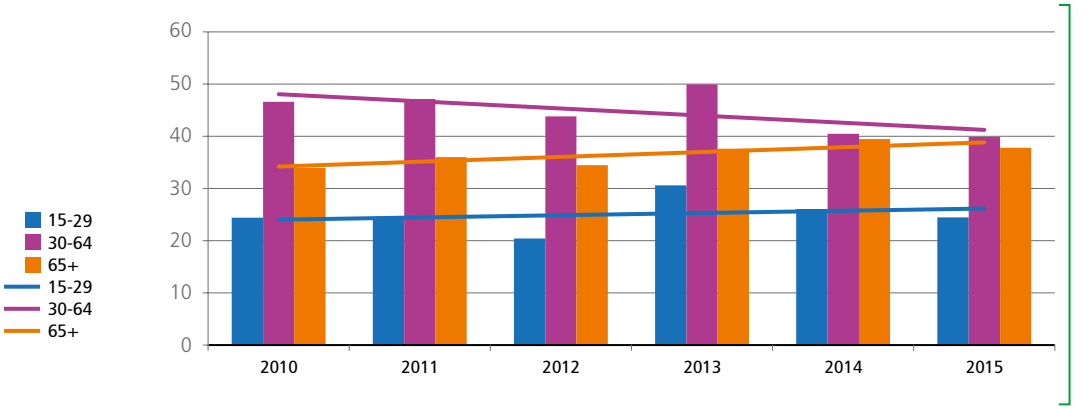
	2012	2013	2014	2015	Goal 2020*
Circulatory system diseases	857.18	847.27	804.06	878.2	700.60
External causes of death	123.16	121.8	113.41	110.5	77.74
Malignant tumours	280.21	274.04	278.19	287.4	265.90
Self-harm (suicide)	30.91	36.22	31.32	30.40	19.50

Source: Institute of Hygiene, SEC

* In 2014, when the LHS was being approved in the Seimas, the Lithuanian Department of Statistics changed the standard for counting standardised mortality (the EU standard was implemented). Seimas approved the LHS, where the standardized mortality was counted using the WHO standard used at the time. 2014-2015 data counted using the WHO standard is not supplied by the department of statistics. Aiming to ensure data comparability, LHS goals are recalculated using the EU standard in and shown in table 13. An assumption is made that the recounted standardised mortality by diseases for 2020 is corrected using the same coefficient as standardised mortality for 2012, for which standardised mortality is known from WHO and EU standards.

Detailed suicide dynamics by age indicated in red are displayed in figure 52.

Figure 52. Suicide dynamics in Lithuania 2010-2015, number by age groups per 100000

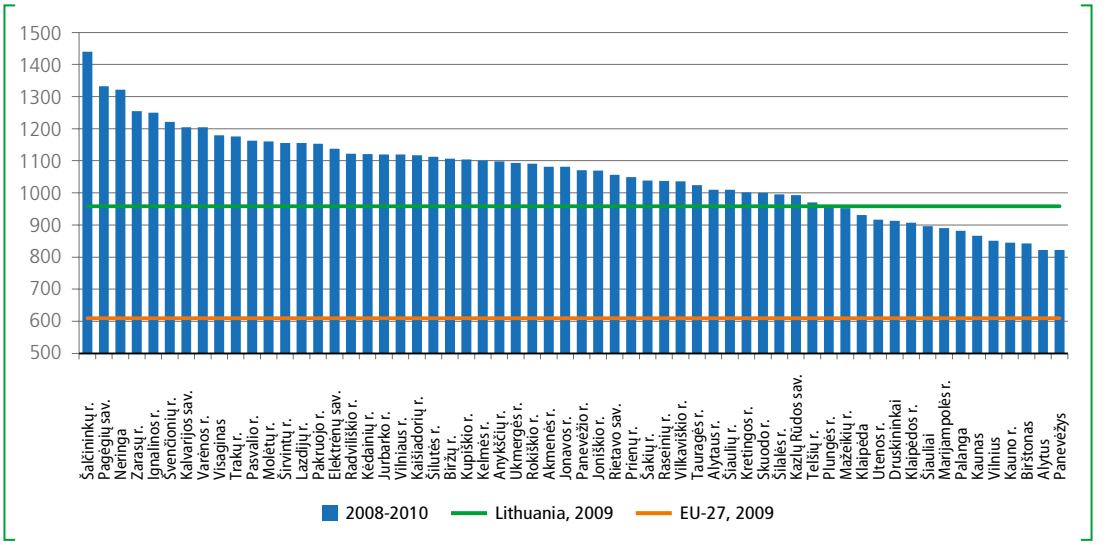


Source: Institute of Hygiene, SEC calculations

The suicide analysis by age groups shows some tendencies for dips in mental health for elderly people while gradual improvement can be seen for middle-aged people. It is likely that a decrease in working age people's mortality due to suicide can be linked to a decrease in unemployment in over the last years.

One of LHS goals was to lower the differences in healthcare, the level of which is portrayed in the LHS text.

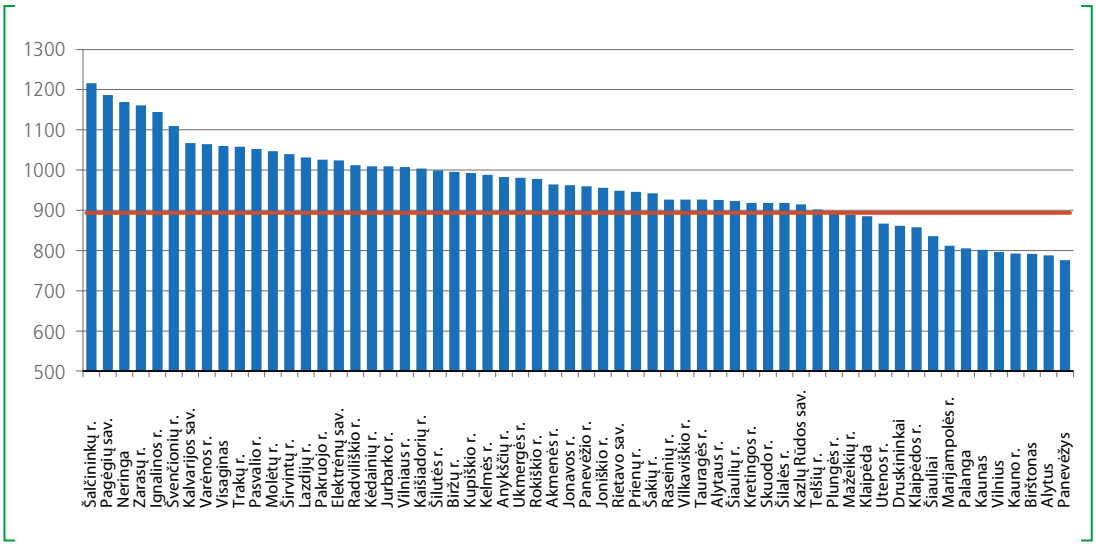
Figure 53. Standardised mortality in Lithuania municipalities 2008-2010, SDR per 100000



Source: LHS

Using the same methodology, a comparison of municipalities 3 years later shows differences in health in 2011-2013. WHO standardised mortality data was used.

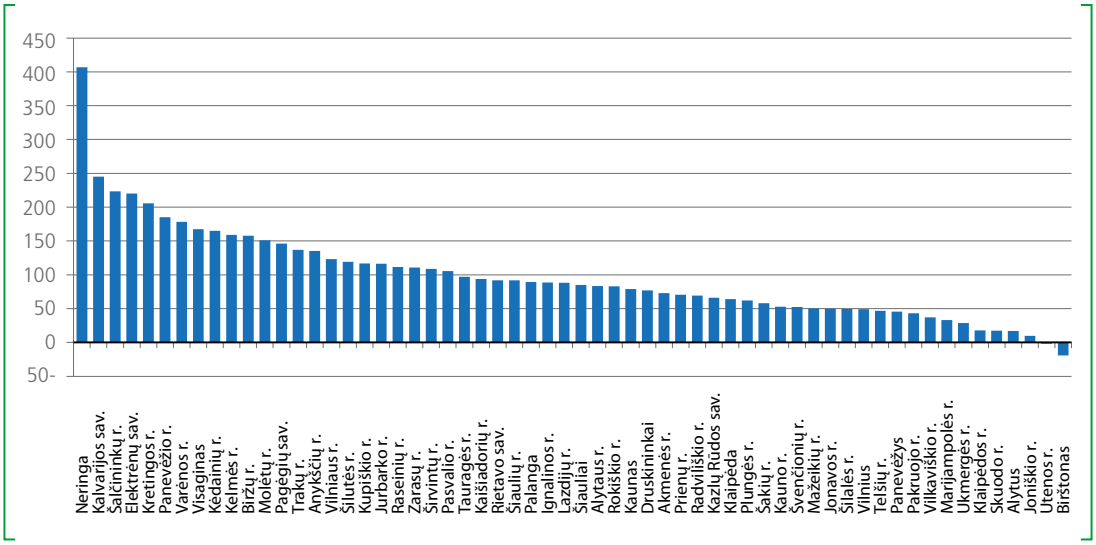
Figure 54. Standardised mortality in Lithuania municipalities 2011-2013, SDR per 100000



Source: Institute of Hygiene, SEC calculations

The figure below compares health differences between the years 2011-2013 and 2008-2010.

Figure 55. Decrease in standardised mortality per 100000 in Lithuania municipalities. Average for 2011-2013 is compared to average of 2008-2010



Source: Institute of Hygiene, SEC calculations

Positive results characteristic to almost all municipalities show the health strengthening process in Lithuania includes almost all municipalities and that a

certain amount of decrease in differences between regions is likely. An extra analysis is needed to confirm the former hypothesis.

Lithuanian health dynamics 2014-2015 as well as the first half of 2016

The year 2014, compared with 2013 saw less deaths in almost every age group and 2015 saw a drop in most age groups, but grew in the 75+ category by such a number that there were more deaths registered in 2015 than in 2013. Notably, all statistics department mortality indicators (per 1000 residents) for age groups over 65 in 2015 were worse than in 2014 as well as (except the 80-84 age group) in 2013.

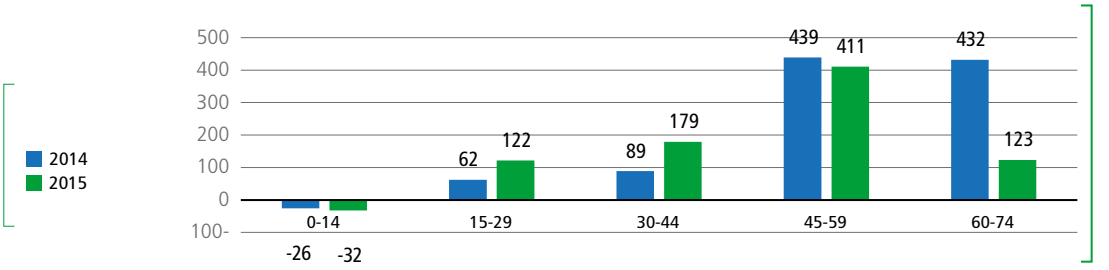
Table 14. Number of lives saved compared to 2013

Age	2014	2015
0 to 14	-26	-32
15 to 29	62	122
30 to 44	89	179
45 to 59	439	411
60 to 74	432	123
75+	263	-1068
Total	**1259**	**-265**

Source: Institute of Hygiene, SEC calculations

A graphically displayed number of saved lives in comparison to 2013 is reflected in figure 56.

Figure 56. A decrease in deaths 2014-2015 compared to 2013 (number of lives saved)



Source: Statistics Lithuania, SEC calculations

Available statistics enables the calculation of the economic results due to health improvements. A likely effect on the economy from health improvement is displayed in table 15.

Table 15. Improvements in health during 2013-2015, Lithuania

Overall number of lives saved	994
Lives saved of working age people (aged 16-65)	1629
GDP, which will be created in 2016 by working age people saved from death in 2014-2015 (an assumption is made that a worker creates 15 thousand euro of GDP)	24.44 million euro
Economic value of lives saved (statistical value of life according to the Ministry of Finance estimates from 2016 is 343927 euro)	341.9 million euro

The department of statistics has presented mortality indicators for half of 2016 which are compared to corresponding data from 2015 in table 16.

Table 16. Monthly number of deaths in 2015-2016

	January	February	March	April	May	June	Total for 6 months
Deaths in 2015	3828	3619	3969	3597	3471	3256	21740
Deaths in 2016	3794	3782	3620	3336	3484	3125	21145
Difference in number of deaths	**-34**	**163**	**-349**	**-261**	**13**	**-131**	**-595**

Source: Statistics Lithuania

The first data from 2016 (number of deaths decreased by almost 600) shows that in 2014 there was a drop in mortality which stopped in 2015 and is likely to recover in 2016. During the implementation span of LHP, a drop in health indicators in 2004-2007 was likely caused by an increase in alcohol use during those years in Lithuania. More research is needed to determine the cause of the decline in health indicators in the beginning of 2015, improvements in 2016 and what should be done to eliminate negative tendencies of health indicator dynamics.

Conclusion and suggestions

- From 1998 long-term health improvement planning (with Lithuania's health program as the base for it) reveals both the countries health systems advantages (ability to assess health indicator compliance with foreseen goals as well as indicate interventions for the players in the health market which effectiveness is backed up by scientific data) as well as disadvantages (weak relationship between indicators in strategic documents as well as planning documents, health indicator dynamics and slow improvements in indicators when compared to international data).
- The implementation of LHS (confirmed in the summer of 2014) will require consistent work to determine the level of measures taken in the program as well as health improvement goals, reasons due to which emerged deviations from the document provisions which were approved by the Seimas. The change in the method for calculating standardised mortality made in 2014 is one the many challenges awaiting those involved in LHS monitoring.

- Health goals and their detalization, confirmed in the LHS, reflected in the LHS project, specialised national and municipality health programs, creates the benchmark for monitoring LHS implementation, if necessary, adjusting legal decisions and decisions regarding health resource distribution.
- Changes happening outside the scope of the health sector (e.g., alcohol consumption, road safety) had essential influence on Lithuania health indicators in 1998-2010 and it is likely that they will remain significant while implementing the LHS.
- If, while implementing the LHS, it will be possible to effectively coordinate the actions of various institutions, it is likely that LHS goals, which are quite ambitious, will be achieved and Lithuania will lose its title as outsider (in terms of EU monitored health indicators).

Regional dimension of LHS

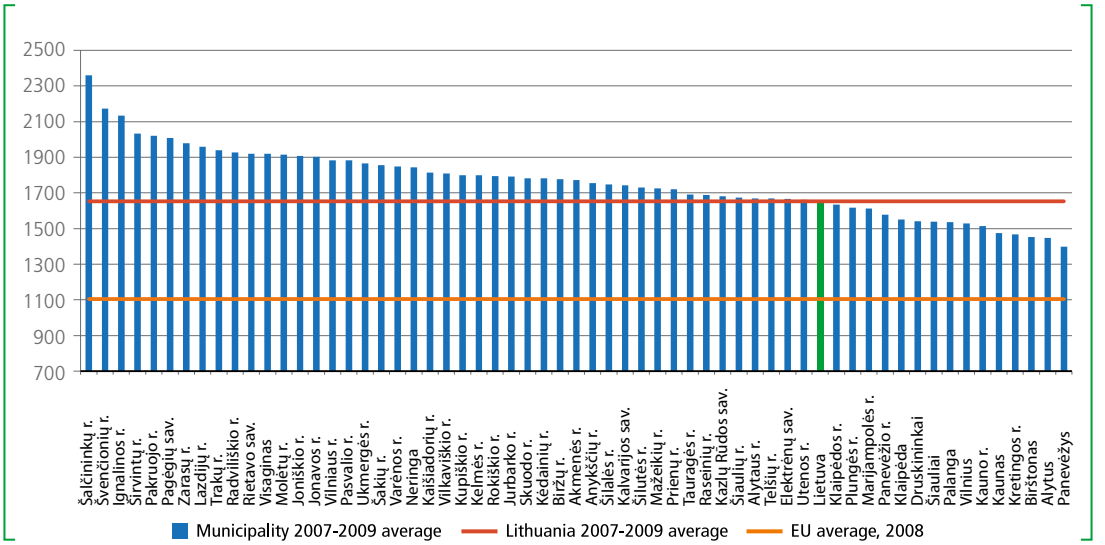
Standardised death rates by municipalities

The Lithuanian Health Strategy is calling to tackle regional health problems by implementing national policies as well as Health Programmes developed by municipalities.

The Department of Statistics has currently introduced the calculation of SDR according to Eurostat standards, thus numbers below are different in comparison to these in figures 53-55.

Statistical figures presented in figure 57 are indicating that at the time of LHS development mortality figures differed substantially between municipalities. A 3 year' average has been used to count volatility of data.

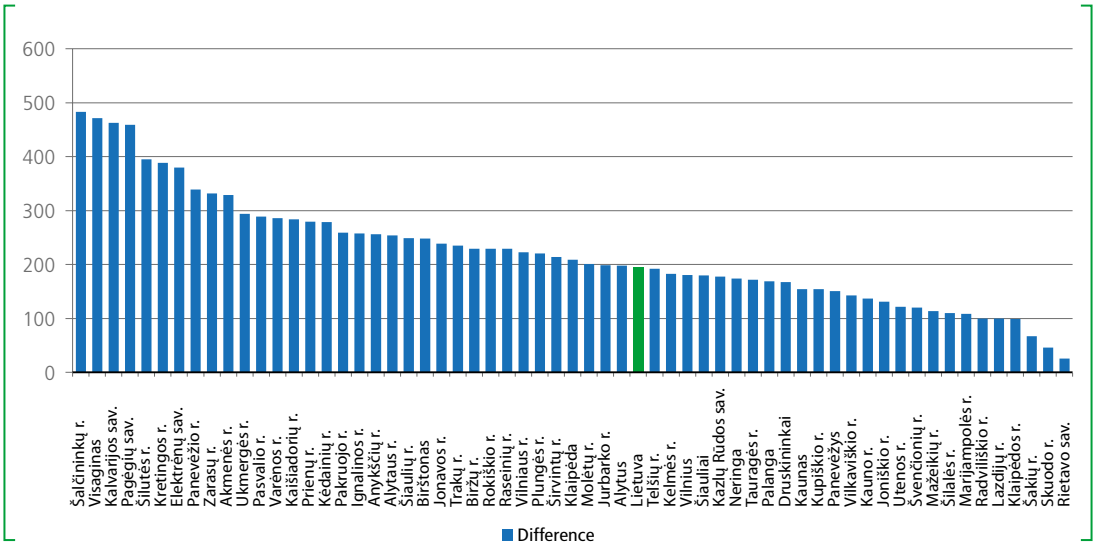
Figure 57. Mortality by municipalities, Lithuania, 2007-2009 average, SDR all causes, all ages per 100000



Source: Institute of Hygiene, SEC

During the period of 2007-2015 most of municipalities have witnessed improvements in population health. The different scale of improvement indicates that the dynamics of change should be considered by actors in health in addition to absolute figures. Improvements in health are measured in absolute figures as changes in SDR are presented in figure 58.

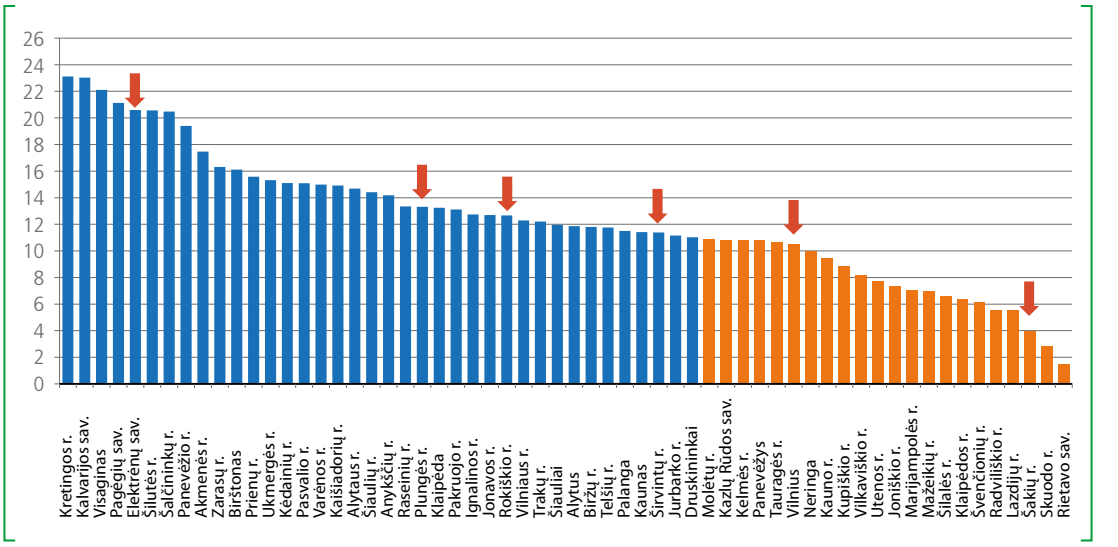
Figure 58. Reduction of mortality by municipalities between periods of 2012-2014 and 2007-2009, SDR per 100000. Difference between 2007-2009 and 2012-2014 averages



Source: Institute of Hygiene, SEC

Changes in percent calculated as ratio between the absolute change in SDR to the indicator at the beginning of the period (average of 2007-2009) are presented in figure 59.

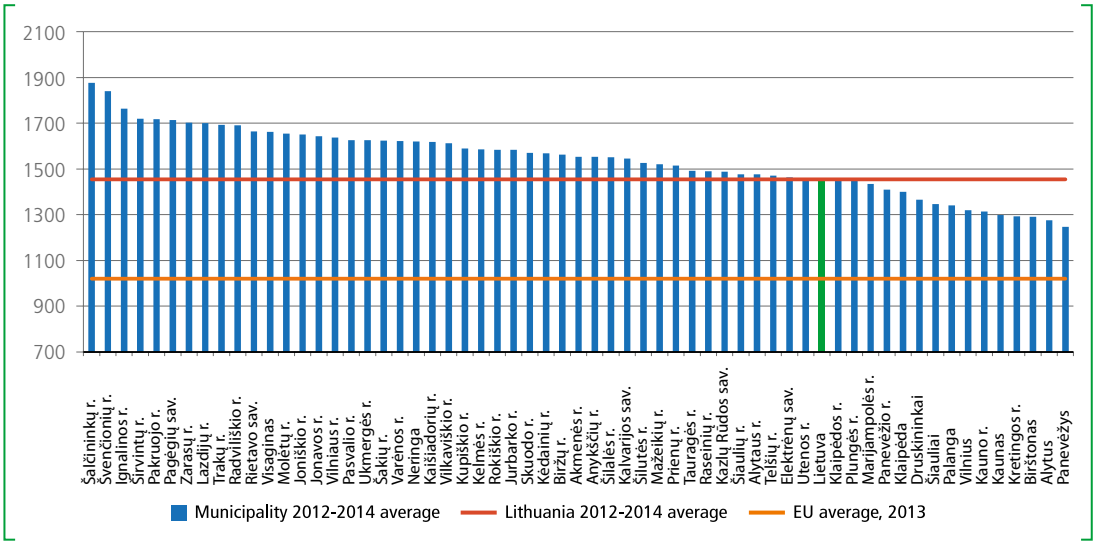
Figure 59. Reduction of mortality (SDR) by municipalities between periods of 2012-2014 and 2007-2009 in percent



Source: Institute of Hygiene, SEC

Municipalities with reduction of SDR by more than 11 percent are coloured in blue and those with reduction of SDR by less than 11 percent by orange. Arrows show municipalities (4 with medium changes, 1 with fast and 1 with slow changes. Underlined distinction between municipalities will be used in the future. The most recent differences in health are presented in figure 60.

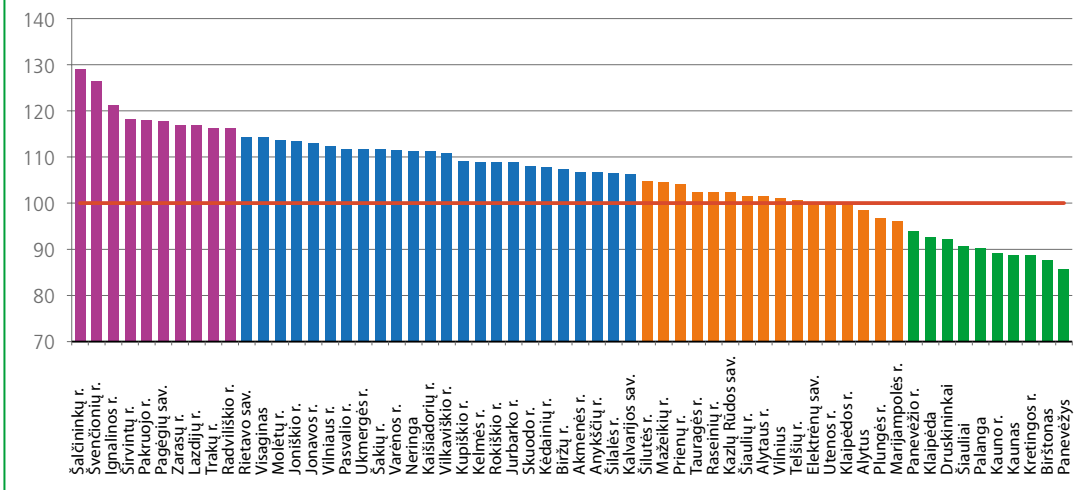
Figure 60. Mortality in Lithuania by municipalities, 2012-2014 average, SDR all causes all ages per 100000



Source: Institute of Hygiene, SEC

Health in all Lithuanian cities with population 50 000+ and resorts are above the national average and not so far from the EU average. On the other hand, the health status of the population of rural municipalities in the north-eastern part of the country is far behind national figures (see *figure 61*).

Figure 61. Municipalities of Lithuania according to deviation in percent from the national average, SDR per 100000, 2012-2014 average



Source: Institute of Hygiene, SEC

Municipalities with SDR of more than 15 percent above the Lithuanian average are coloured in pink, with SDR between 15 and 5 percent above the Lithuanian average in blue, with 5 percent deviation from the average in orange and more than 5 percent below the average in green. Arrows show municipalities that will be examined in more details later on.

Health objectives by municipalities

The national health programme has been designed by having in mind reduction of gap in health status measured mainly by mortality statistics between Lithuania and the average figures for the EU. Current differences between municipalities regarding health outcomes implies importance to adjust national figures to the needs and health aspirations of each self-government:

1. Municipalities with statistics close to the national average (orange fraction of the *figure 61*) may take national goals of longevity in 2024 as a proxy for the municipal ones. Municipalities with aspirations to outperform their peers may of course decide on more ambitious goals.
2. Municipalities with statistics slightly below the national average (blue fraction of the chart) having ambition to improve their relative position in the "health League" may take national goals of longevity in 2024 as a proxy for the municipal ones. Certain cautiousness is important to assure a match

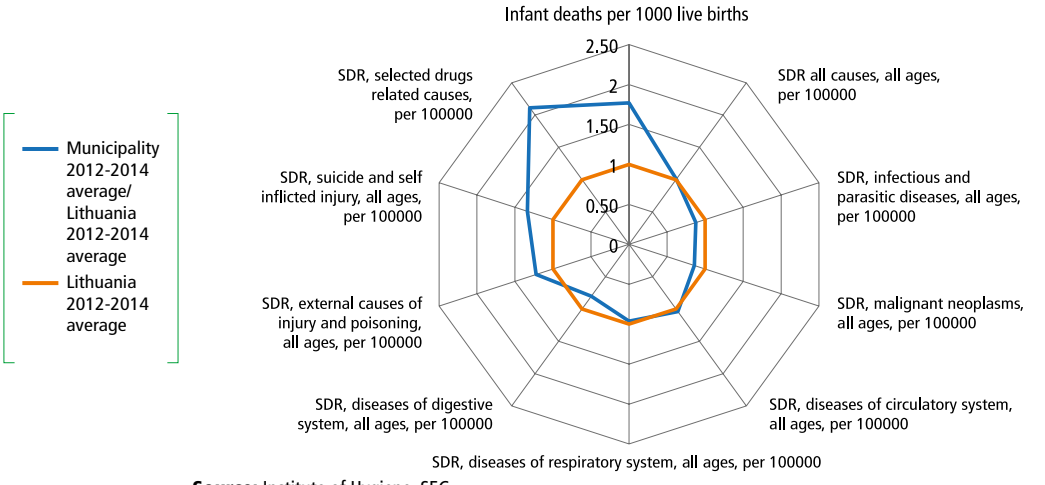
of optimistic expectations with the realism of processes in health promotion, disease prevention and cure.

3. Municipalities with statistics far below the national average (pink fraction of the chart) should most likely consider national goals of longevity in 2024 for deciding upon the dynamics of development. Absolut figures of health targets fixed in national strategy are most likely going to not be achieved by the majority of municipalities in the pink fraction but the deviation from the national average should not increase. Municipalities with aspirations to outperform their peers should look at reducing health gaps thus for a development rate faster in comparison to that of municipalities in the middle of the League. It is in the interest of the national authorities to support (the proper allocation of structural funds may be considered as one of forms of this support) the reduction of deviation from the national average.
4. Municipalities statistically above the national average (green fraction of the chart) may take national goals of longevity in 2024 just as a pessimistic scenario of development. For best performers, It make sense to decide on reaching most of health indicators currently available as EU average figures in 10 years. Municipalities with aspirations to outperform their peers may of course decide on more ambitious goals taking in to account that the source of this outperforming should mainly be generated not by national authorities but by municipalities (local authorities and respective communities combined) themselves.

Specificity of municipalities by causes of death

Elektrėnai municipality was selected as one with the biggest gains in health with SDR in 2012-2014 at Lithuanian average (see *figure 59*). It is a pretender to be an ambitious player in the yellow fraction of the League. Under assumption that the Lithuanian average for a particular cause of death equals 1 most of figures for the Elektrėnai municipality are close to the Lithuanian average with external causes of death especially drugs related and infant mortality of certain concern.

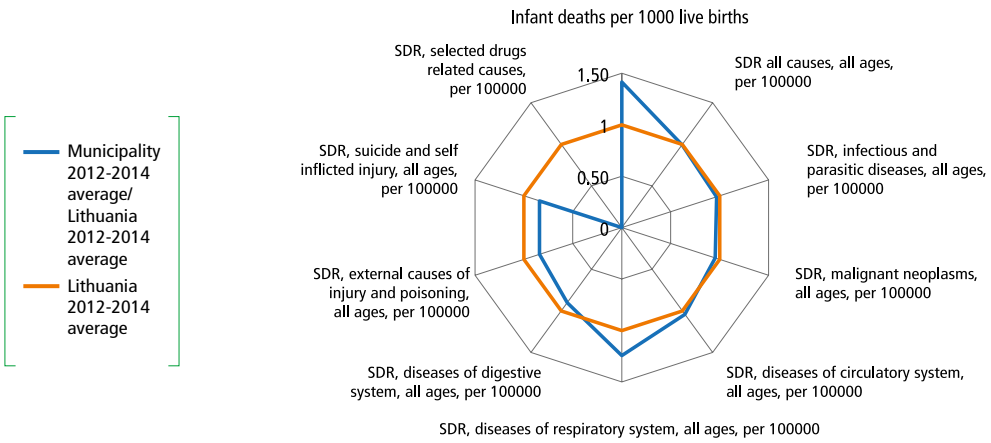
Figure 62. Mortality in Elektrėnai



Source: Institute of Hygiene, SEC

Plungė municipality was selected as one with medium gains in health with SDR in 2012-2014 at the Lithuanian average.

Figure 63. Mortality in Plungė

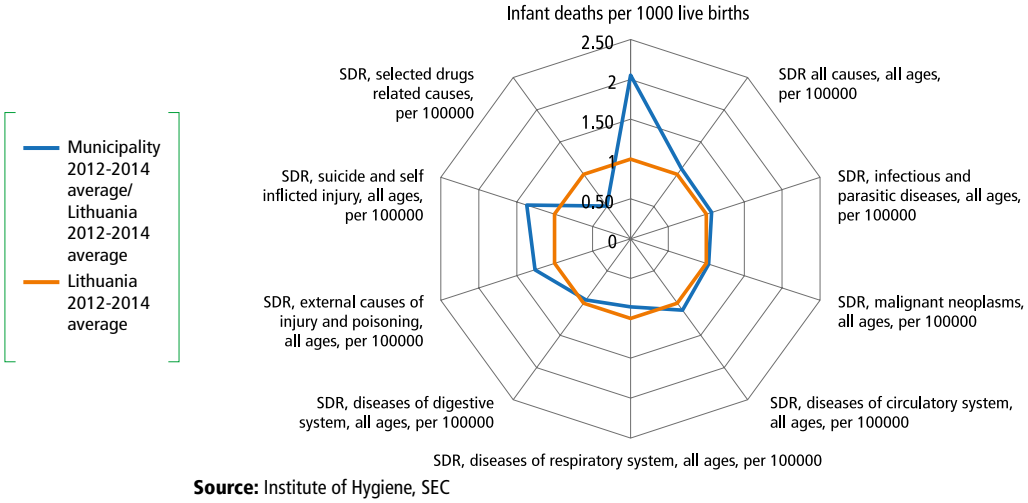


Source: Institute of Hygiene, SEC

Most of figures for the Plungė municipality are close to the Lithuanian average with infant mortality and diseases of the respiratory system of certain concern. Drugs related deaths are not recorded in the municipality in the years 2012-2014.

Rokiškis municipality was selected as one with medium gains in health with SDR in 2012-2014 modestly above the Lithuanian average. External causes of death including suicides as well as infant mortality is of certain concern in the territory.

Figure 64. Mortality in Rokiškis

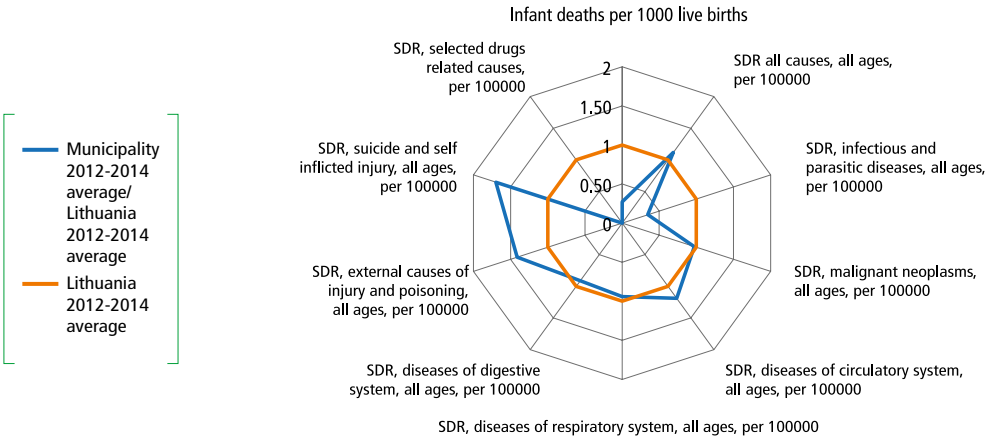


Source: Institute of Hygiene, SEC

Šakiai municipality according to the main characteristics (tempo of gains and absolute SDR is similar to Rokiškis. But with quite a specific structure of deaths.

Infant mortality as well as deaths caused by infectious diseases are below national average, drugs related deaths are not recorded, but deaths caused by external causes and diseases of circulatory system are more common.

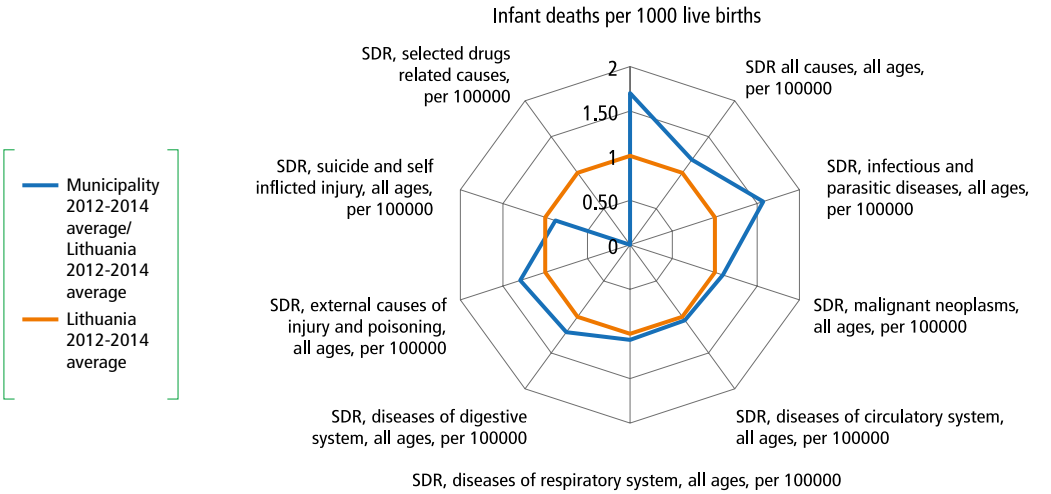
Figure 65. Mortality in Šakiai



Source: Institute of Hygiene, SEC

Širvintai municipality was selected as one with medium gains in health with SDR in 2012-2014 much above the Lithuanian average. Most causes of death except ones related to suicides and drugs are above the national average.

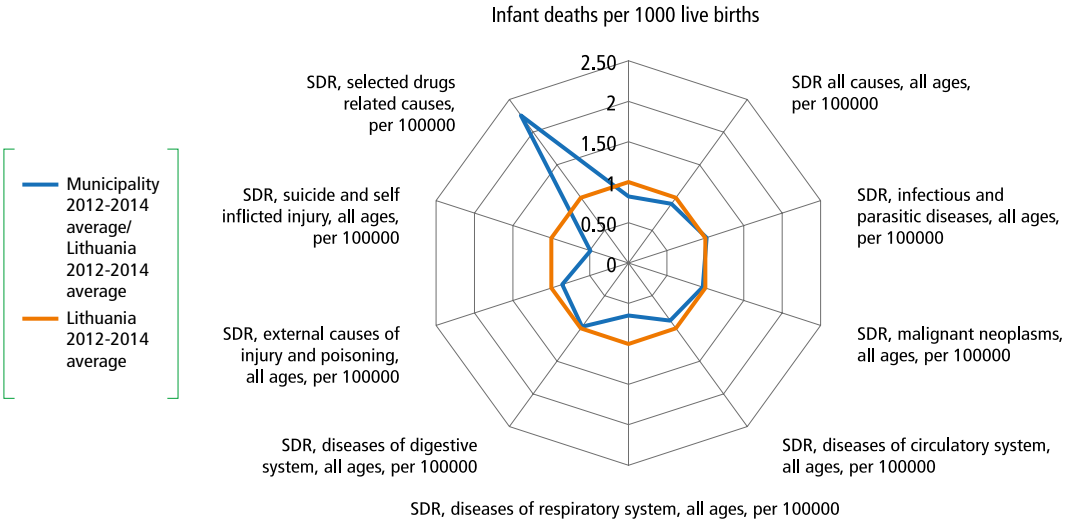
Figure 66. Mortality in Širvintai



Source: Institute of Hygiene, SEC

Vilnius municipality was selected as one with medium gains in health with SDR in 2012-2014 below the Lithuanian average. Most causes of death except ones related to drugs are below the national average.

Figure 67. Mortality in VIlnius



Source: Institute of Hygiene, SEC

Charts reflecting municipal specificity are indicating importance of regionalisation of objectives of municipal public health development:

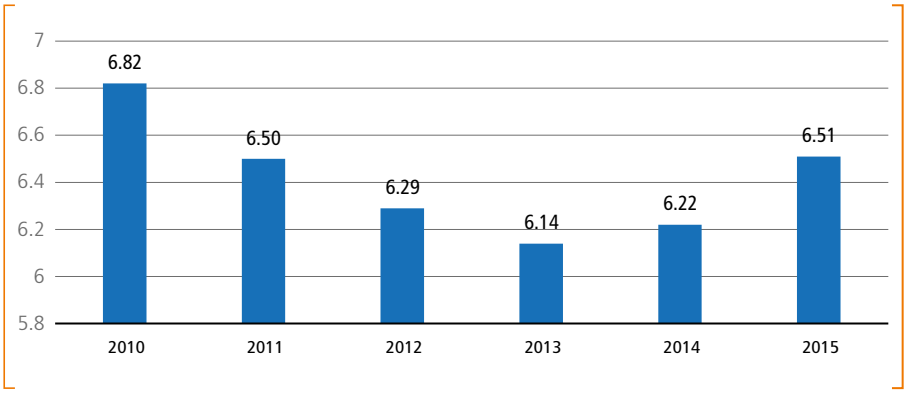
- Elektrėnai and Vilnius are territories with relatively wide spread drug abuse thus secondary prevention and harm prevention as well as treatment of drug addicts is of importance for these municipalities. Primary prevention is the main objective for most rural municipalities regarding drugs.
- 4 of 5 rural municipalities presented by the charts are confronted with problem of infant mortality. This is an indication of an importance to strengthen the regional dimension of neonatal policy in Lithuania with certain specific measures designed and implemented in each territory of concern.
- Most of rural municipalities are challenged by deaths from external causes above the national average. The seriousness of the situation regarding this cause of death is underlined by the fact that the Lithuanian figure for external causes related deaths is far above the European average. Plungė municipality has the best figures from all studied rural territories. The "statistical leadership" of Plungė may be considered as worth studying for the design of good regional practise based municipal health strategies.
- In years 2012-2014 Širvintai municipality was behind national average by almost all indicators used in the analysis. The Municipality is in the proximity of the Lithuanian capital which is usually consider as a positive health factor. Specificity of health system including quality of health governance may appear to be restraining factors at least during the period covered by statistics.

4 Health care in Lithuania according to National Health Accounts

Since 2004 Lithuanian Department of Statistics is computing current health care expenditures according to sources of financing, health functions and providers. Statistics for 2004-2011 had been reflected in Health Studies Lithuania 2013. The current paper is looking for statistics for years 2010-2015.

Health expenditure as share of GDP was falling in 2010-2013 from 6.82 percent to 6.14 percent and growing in 2014-2015 up to 6.51 percent.

Figure 68. Current health expenditures in Lithuania as share of GDP, percent



Source: Statistics Lithuania

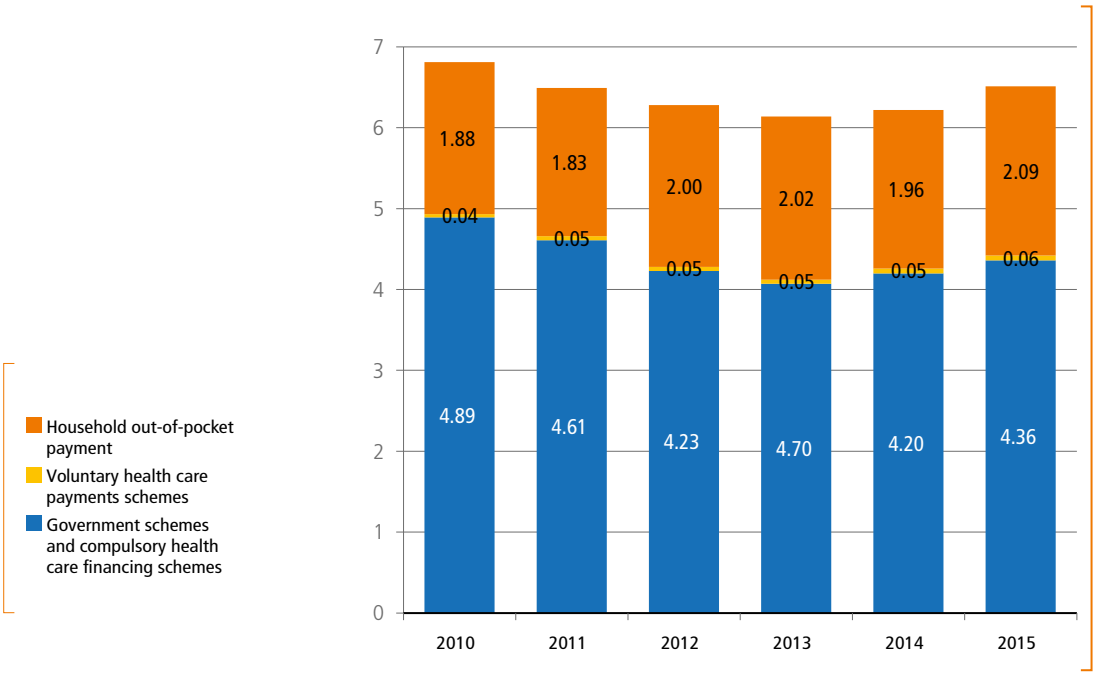
Data on expenditures by financing sources provides signs to understand volatility.

The period of 2010-2013 was marked by economic recession of 2009-2010 and austerity programs to balance public finances that followed in 2011-2013. Austerity reduced share of public financing from 4.89% of GDP in 2010 to 4.07% of GDP in 2013. The decline of public financing has been counted by growing private spending from 1.88% of GDP in 2010 to 2.02% of GDP in 2013, but this growth was too small to mitigate all reduction in public spending.

Softening of austerity policies in 2014 had contributed to recovery in public health spending, thus (with stable private spending) growth of expenditures for health in GDP.

Statistical data shows that importance of private voluntary health insurance is marginal in Lithuania with less than 1 percent of health care costs covered by the source.

Figure 69. Current health expenditures by financing source in Lithuania, share of GDP, percent



Source: Statistics Lithuania

Structure of current health care expenditures by functions during the period 2004-2010 was marked by a decrease of relative importance of medical goods from 37.3 percent in 2004 to 30.1 percent in 2010 as well as preventive care from 1.8 percent to 0.9 percent and increase of long term nursing care from 3.6 percent in 2004 to 8.9 percent in 2010 and ancillary services from 4.3 percent to 5.8 percent.

Statistics for 2010-2015 is presented in the figure 70 and table 17 shows that structural changes of 2004-2010 were somehow halted with stable expenditures for nursing at 8.6 percent in 2015 and share of ancillary services reduced to 5.2 percent. Preventive care recovered from 0.9 percent in 2010 to 1.9 percent in 2015. Distribution of expenditures for curative care slightly (by about 2 percent points) shifted from hospital care to outpatient care, thus illustrating certain success of health restructuring.

Figure 70. Structure of current health expenditures in Lithuania by functions, percent

Source: Statistics Lithuania

The table shows that expenditures in monetary terms are growing for most of functions even for functions (e.g., inpatient care) that are losing share of total expenditures. Rehabilitative care was the only health sector with reduced annual funding from almost 90 million euro in 2011-2012 to about 70 million euro in 2014-2015.

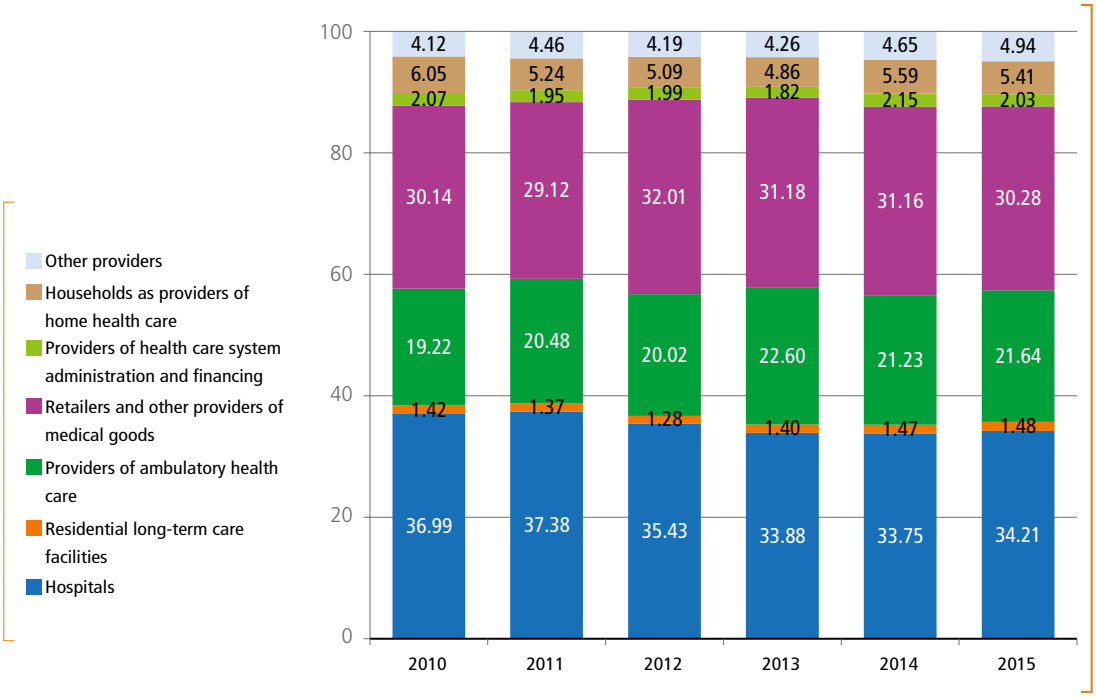
Table 17. Structure of current health expenditures in Lithuania by functions, thousand euro

	Inpatient and day curative care	Outpatient and home based curative care	Rehabilitative care	Long-term care (health)	Ancillary services	Medical goods	Preventive care	Governance, and health system and financing administration	Total
2010	546803.63	384854.01	63721.39	170845.7	111223.67	575653,9	17765,16	39526,45	1910394
2011	573100.61	434457.07	85814.83	163383.87	120341.4	589689,9	25358,03	39642,87	2031789
2012	572155.25	431995.93	93876.32	160352.94	105426.38	667472,8	23917,11	41651,91	2096849
2013	581324.17	488353.07	66898.35	163297.5	112347.35	666499,4	28758	39044,05	2146522
2014	601587.99	488382.26	66452.6	198397.48	117158.64	703306,6	41585,81	48705,98	2265577
2015	658084.9	538871.69	68922.28	210187.62	126203.71	732983,2	46892,33	49437,31	2431583

Source: Statistics Lithuania

Structure of current health care expenditures by providers during the period 2010-2015 is indicating stable leadership of 3 main institutional groups. Hospitals are in command of about 35 percent of the market, retailers – 30 percent and providers of ambulatory care – 21 percent. Certain decrease of share for hospitals corresponds to modestly reduced role of inpatient care.

Figure 71. Structure of current health expenditures in Lithuania by providers, percent



Source: Statistics Lithuania

The table below is for readers looking for absolute figures.

Table 18. Structure of current health expenditures in Lithuania by functions, thousand euro

	Hospitals	Residential long-term care facilities	Providers of ambulatory health care	Retailers and other providers of medical goods	Providers of health care system administration and financing	Households as providers of home health care	Other providers	Total
2010	706.572,21	27.086,07	367.198,71	575.715,34	39.526,45	115.629,08	78.666,02	1.910.393,89
2011	759.537,46	27.900,92	416.015,62	591.603,78	39.642,87	106.503,39	90.584,55	2.031.788,59
2012	742.863,50	26.829,09	419.815,32	671.184,41	41.651,91	106.655,79	87.848,65	2.096.848,68
2013	727.214,70	29.987,58	485.121,30	669.356,03	39.044,05	104.380,26	91.417,99	2.146.521,93
2014	764.543,22	33.282,95	480.952,57	706.062,37	48.705,98	126.576,58	105.453,65	2.265.577,31
2015	831.930,44	36.095,82	526.255,10	736.196,15	49.437,31	131.495,56	120.172,70	2.431.583,07

Source: Statistics Lithuania

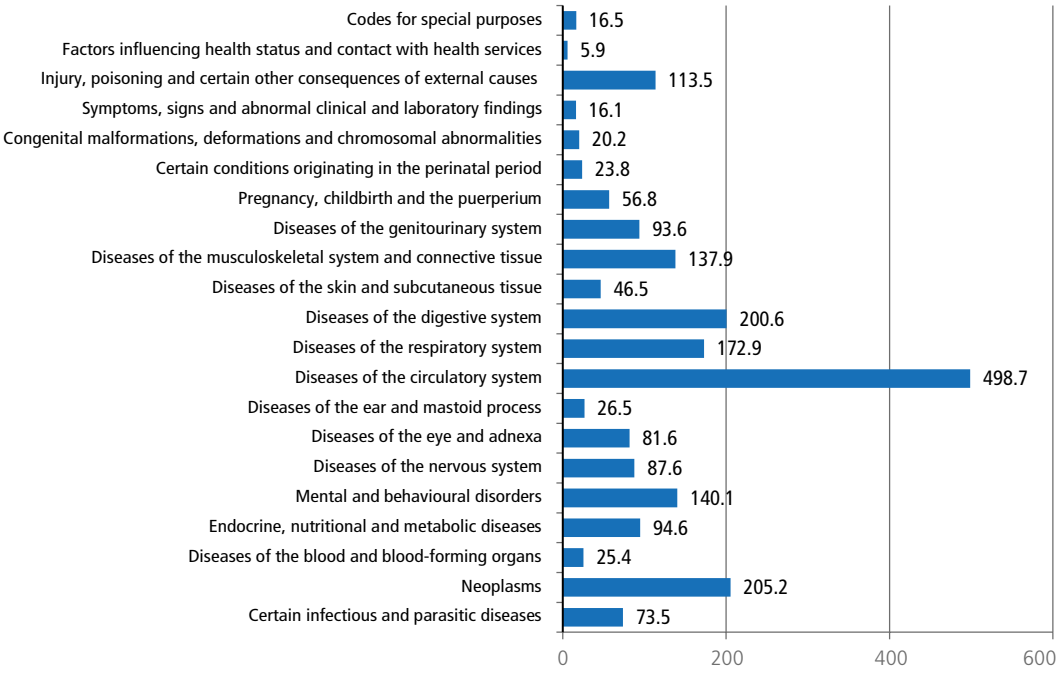
Recent development of System of national health accounts (SHA) provides an opportunity to examine national health expenditures by diseases. Eurostat-funded project, Health Expenditures by Diseases and Conditions (HEDIC) started in November 2013 and lasted 30 month. Research Consortium had representatives from 16 European Member States (MS) including Health Economics Center (Sveikatos Ekonomikos Centras) from Lithuania. The primary aim of the research was to develop further the methodology for the consumer health interface under the System of Health Accounts (SHA), and hence to provide more detailed information on health care expenditure in relation to its uses and beneficiaries, as a contribution to the public health statistics available for monitoring EU health. For the final report of the project see Eurostat Statistical Working Papers, HEDIC 2016 edition. Data presented in figures 72-76 has been generated during the project by Health Economics Center using projects methodology and data provided by Lithuanian Statistics and Lithuanian Social Health Insurance Fund.

The enhancement of SHA named HEDIC delivers information about structure of expenditures in percent as well as in monetary form.

Figures presented in the figure 72 are indicating:

- Circulatory diseases is clearly the main cost driver in Lithuania with about 500 million euro spend in year 2013.
- Neoplasms and diseases of digestive system, respiratory and mental disorders, diseases of musculoskeletal system are covering substantial share of health care costs. High costs of treating digestive problems are related to dental care covered by this IDC group.
- Infectious diseases are generating about 75 million euro in health care costs or 2-3 times less in comparison to diseases indicated in group above. Relatively low expenditures for treatment of infections reflect the fact that modern health care is mainly about treatment of non-communicative diseases.

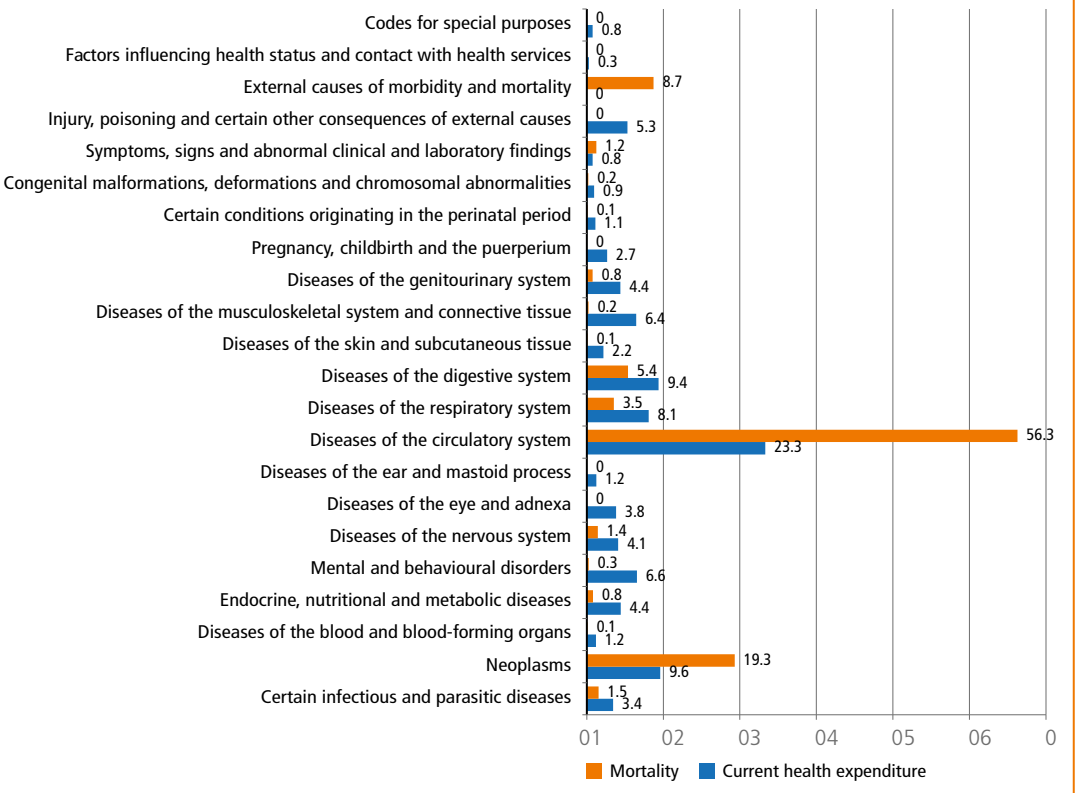
Figure 72. Current health expenditures in Lithuania by diseases, 2013, million euro



Source: HEDIC

Expenditures per disease as percent of total are presented in figure 73. Comparison of expenditure structure with structure of mortality provides a picture of complex interactivity between disorders and health interventions aimed to save life, to cure non-fatal disease, to reduce suffering or just to create comfort. For mental disorders with relatively high expenditures and low mortality data presented in the picture may be inspirational for raising questions about precision of medical statistics.

Figure 73. Structure of current health expenditures and mortality by diseases in Lithuania, 2013, percent



Source: HEDIC

HEDIC provides an opportunity to study health care expenditure structure per disease according to health functions, provides, financial sources. For all ICD groups costs by functions are presented in the table 19.

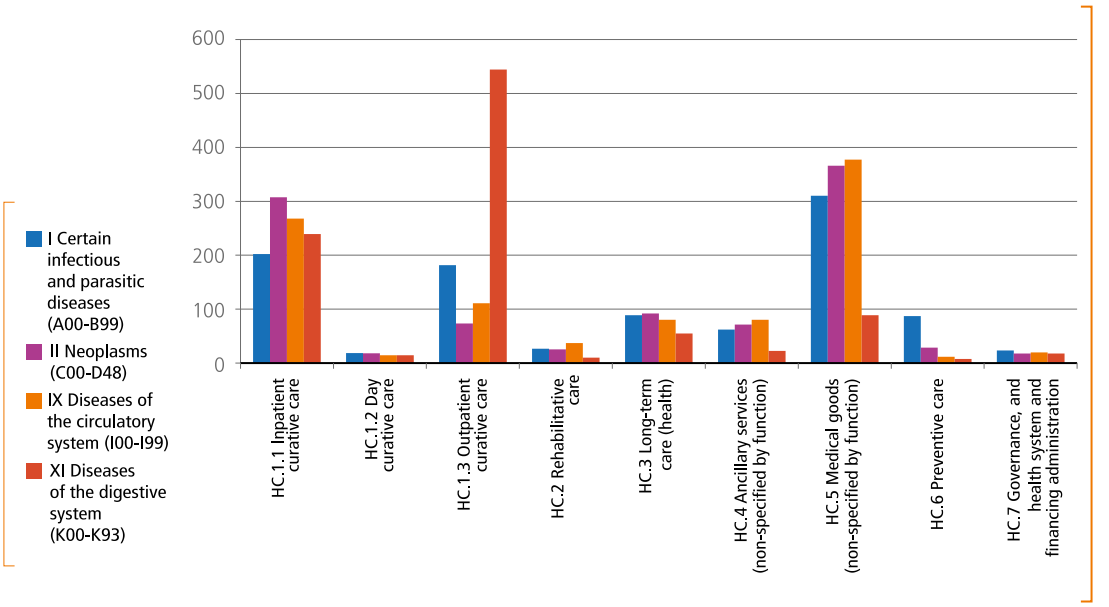
Table 19. Structure of current health care expenditures by diseases and functions, Lithuania, 2013, percent

	Inpatient curative care	Outpatient curative care	Rehabilitative care	Long-term care	Medical goods	Preventive care	Total
Certain infectious and parasitic diseases	0.76	0.62	0.09	0.31	1.07	0.30	3.44
Neoplasms	3.13	0.71	0.24	0.88	3.51	0.27	9.60
Diseases of the blood and blood-forming organs	0.16	0.23	0.01	0.05	0.70	0.01	1.19
Endocrine, nutritional and metabolic diseases	0.43	1.39	0.03	0.12	2.29	0.02	4.43
Mental and behavioural disorders	2.29	0.66	0.09	0.72	2.14	0.05	6.56
Diseases of the nervous system	0.65	1.07	0.20	0.17	1.74	0.03	4.10
Diseases of the eye and adnexa	0.55	0.82	0.05	0.15	2.12	0.03	3.82
Diseases of the ear and mastoid process	0.11	0.63	0.01	0.03	0.40	0.01	1.24
Diseases of the circulatory system	6.59	2.59	0.87	1.87	8.81	0.27	23.33
Diseases of the respiratory system	2.15	2.29	0.23	0.59	2.32	0.06	8.09
Diseases of the digestive system	2.38	5.11	0.09	0.52	0.83	0.07	9.38
Diseases of the skin and subcutaneous tissue	0.40	0.96	0.03	0.11	0.56	0.02	2.18
Diseases of the musculoskeletal system and connective tissue	1.85	1.84	0.50	0.52	1.36	0.05	6.45
Diseases of the genitourinary system	1.33	1.34	0.08	0.36	1.02	0.03	4.38
Pregnancy, childbirth and the puerperium	1.27	0.40	0.07	0.35	0.40	0.02	2.66
Certain conditions originating in the perinatal period	0.57	0.16	0.02	0.16	0.14	0.01	1.11
Congenital malformations, deformations and chromosomal abnormalities	0.28	0.20	0.02	0.08	0.30	0.01	0.94
Symptoms, signs and abnormal clinical and laboratory findings	0.11	0.00	0.00	0.03	0.56	0.01	0.75
Injury, poisoning and certain other consequences of external causes	1.99	1.42	0.31	0.56	0.33	0.04	5.31
Factors influencing health status and contact with health services	0.21	0.00	0.00	0.06	0.00	0.00	0.27
Codes for special purposes	0.00	0.00	0.20	0.00	0.56	0.00	0.77
Total	**27.20**	**22.42**	**3.13**	**7.64**	**31.17**	**1.32**	**100.00**

Source: HEDIC

Examples of these structures for 4 main diseases are presented in pictures below.

Figure 74. Structure of current health care expenditures by diseases by functions, total expenditure per disease = 100, 2013, Lithuania



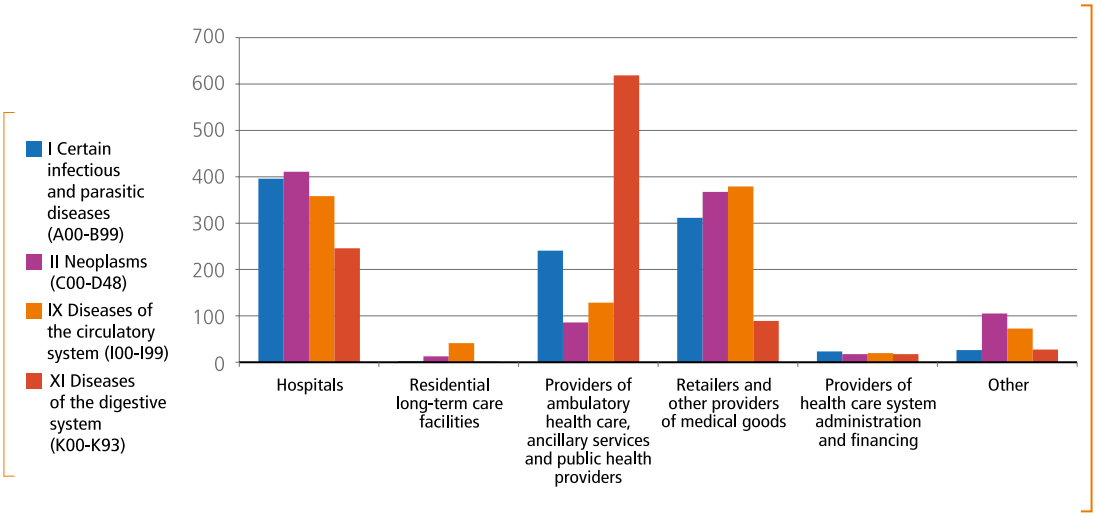
Source: HEDIC

The first glance on health care expenditures according to health functions is providing these insights:

- For most diseases 30+ percent of expenditures are allocated to medical goods purchased on retail market (mainly medicines).
- Hospital acute care is the second biggest (about 27 of expenditure) and outpatient care is the third (about 22 percent of expenditure) biggest component of costs.
- Dental care representing roughly halve of expenditures related to diseases of the digestive system makes structure of this group very special. Dental care is mainly about outpatient care and has very little to do with medical goods obtained on retail market.
- Preventive care is important for management of infections but marginal for other health policies (about 1,3 percent of expenditure).
- Using potential of day care is an opportunity for the future.

Governance costs are relatively small. Gains in efficiency of health care system related to smart additional investment in governance of health are likely.

Figure 75. Structure of current health care expenditures by diseases by providers, total expenditure per disease = 100, 2013, Lithuania

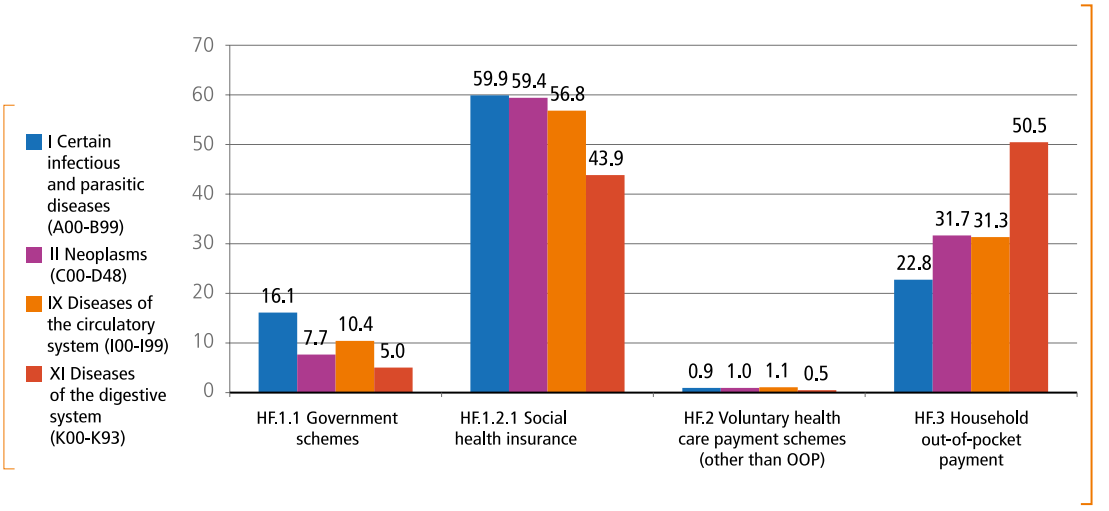


Source: HEDIC

The first glance on health care expenditures according to health providers is inspiring these insights:

- Hospitals are strongest (from expenditure point of view) actors in health system. The fact that hospitals in Lithuania are providing inpatient as well as outpatient care is contributing to the share of hospitals in total health costs much above share of inpatient care (see *figure 74*).
- Retailers of medical goods represent the second strongest actor with its importance sometime undermined by linking health just to professional activities of doctors and nurses and/or vilified by overstressing for-profit nature of most of companies dealing with medical goods.
- Outpatient care institutions are of most importance for dental care (thus patients heaving digestive disorders) and treatment of infections. On the other hand, according to financial figures, consulting and cure of cancer and heart problems has not strongly established in family practices and other outpatient institutions.

Figure 76. Structure of current health care expenditures by diseases by financial source, total expenditure per disease = 100, 2013, Lithuania

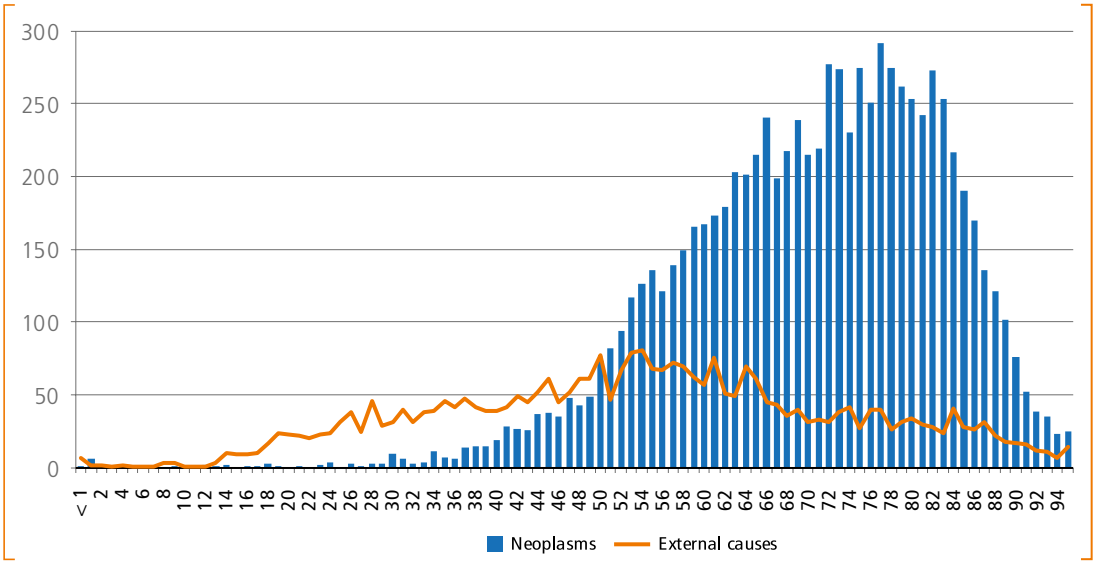


Source: HEDIC

Quick look to health care expenditures according to financial sources is generating ideas as follows:

- Public financing is covering about 70 percent of costs related to most diseases excluding dental care.
- Social health insurance is of most important financial channel in health sector with state budget and municipal budgets playing supportive role.
- Majority of dental costs (thus expenditure linked to digestive disorders) are covered by patients.
- Voluntary health insurance is very limited in covering costs of all diseases.
- Marginal importance of voluntary health insurance in dental care is, likely, explained by the specificity of dental market. Big dental costs usually are of not accidental nature and poorly insurable because of the reason.
- Deaths related to external causes is an example of strongest divergence of Lithuanian health system from these in majority of EU countries. External causes is the main cause of mortality in the age group 10-40 years. Most of deaths in this group are before retirement age what is in sharp contrast with mortality caused by cancer with majority dying at the age 65+ (see picture).

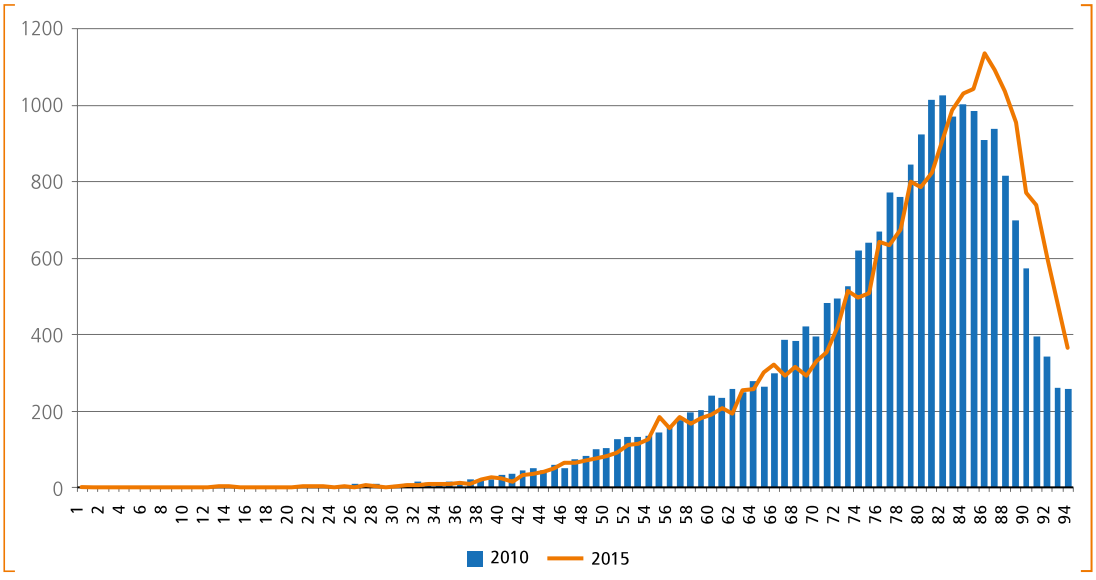
Figure 77. Mortality from neoplasms and external causes by age in Lithuania, 2015, persons



Source: Institute of Hygiene

Deaths related to cardiovascular diseases similar to neoplasms are most prevalent in senior age. Comparison of figures for year 2010 and 2015 shows clear shift of mortality to older age. In 2010 mortality from cardiovascular diseases peaked at age 81-83. The maximum in 2015 was at the age around 90.

Figure 78. Mortality from cardiovascular diseases by age, Lithuania 2010 and 2015, persons



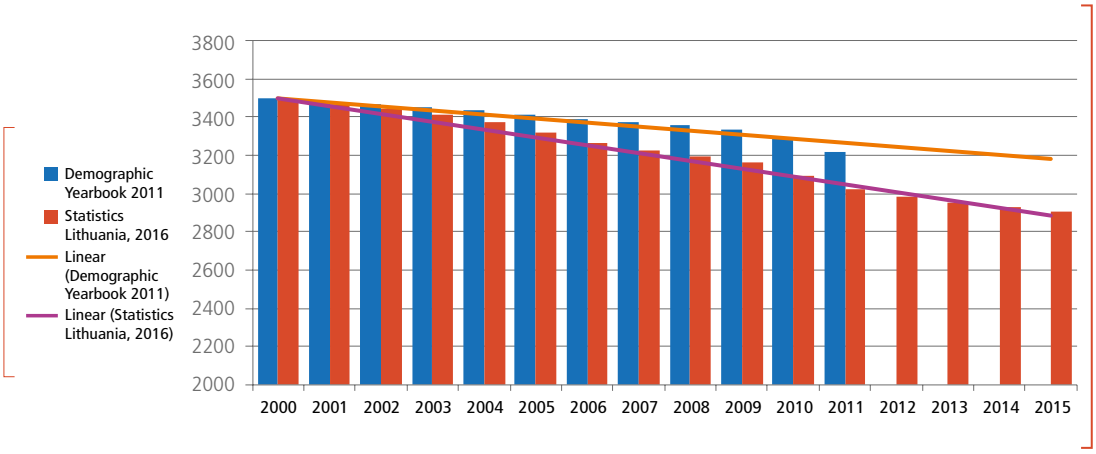
Source: Institute of Hygiene

5 Recent development in health

Demographic situation

Number of residents in Lithuania at the beginning of 2016 was 2.888,6 thousands[1], i.e. by 32.7 thousand less to compare with the beginning of 2015. There were several reasons for the decrease in population – negative net migration and negative natural growth. Number of Lithuanian residents has decreased by 594.6 thousand during the recent fifteen years (2000-2015).

Figure 79. Change in number of residents (population), thousand



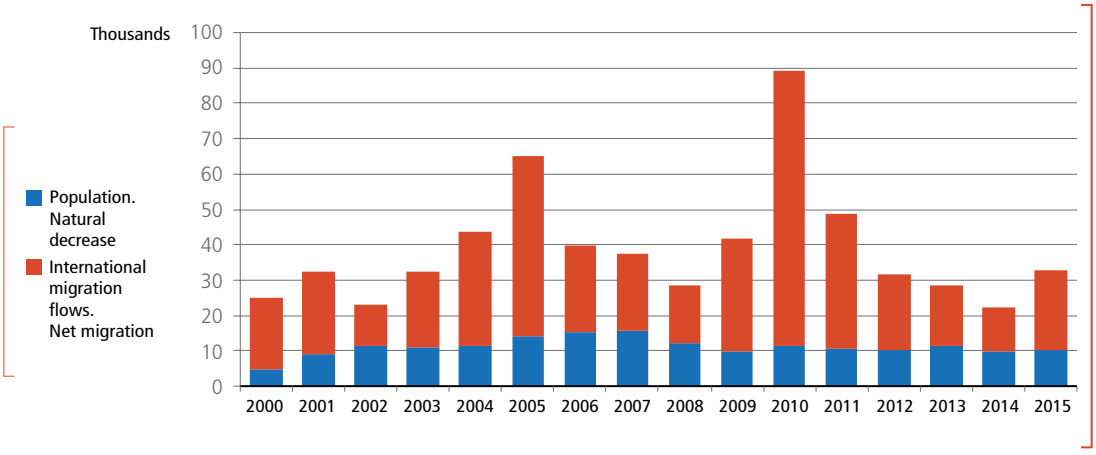
Source: Statistics Lithuania, Demographic Yearbook 2011

Figure 76 shows that until 2011 perception what regards resident population was more optimistic. Population census of 2011 has revelled almost 200000 less residents in comparison to pre census statistical data. Trend of depopulation in period 2000-2010 also appeared to be much stronger. The trend remained almost the same in 2011-2015.

31.48 thousand were born in Lithuania in 2015 (by 1106 infants more to compare with 2014). The lowest birth rates were reported in 2002 – 8.6 births per 1000 population; this number has increased and reached 10.8 births per 1000 population in 2015. There were 41.78 thousand of death cases reported in Lithuania in 2015, by 1524 more to compare with 2014. Thus, natural decrease of population in 2015 was – 10301. Highest natural decrease of population in Lithuania was in 2007 and reached – 15604.

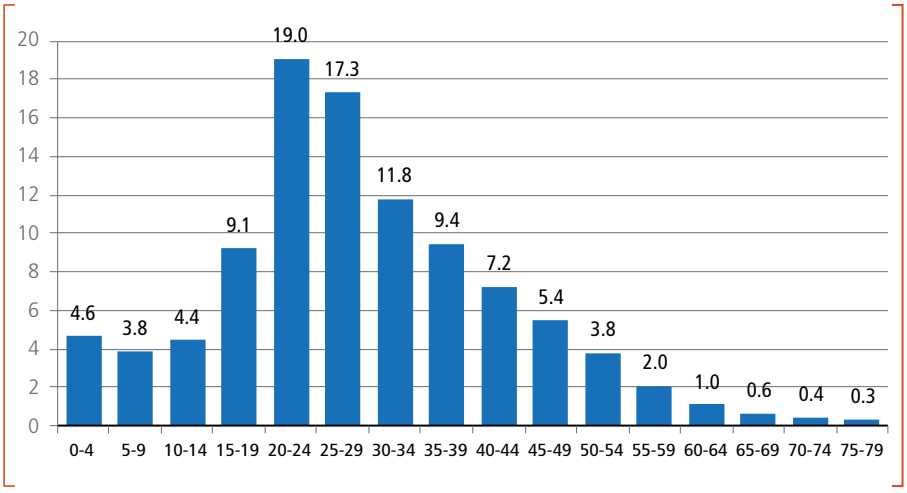
[1] Statistics Lithuania, 2016.

Figure 80. Decrease in the number of residents due to natural decrease of population and emigration



Source: Statistics Lithuania

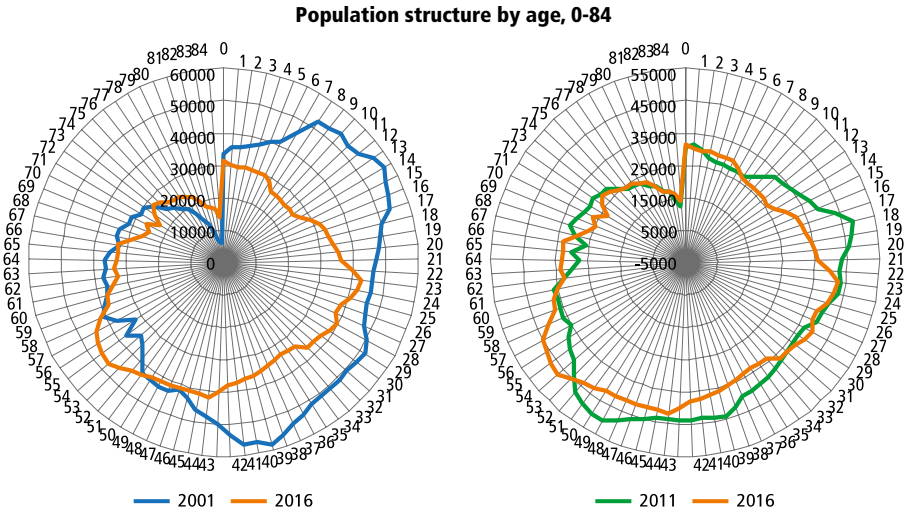
Figure 81. Emigration structure by age groups, 2001-2015, percent of total



Source: Statistics Lithuania

The figure below illustrates the changes in the structure of Lithuanian population during the period 2001-2016. At the beginning of 2016 there were 548.53 thousand of residents, or about 19% of all population, aged 65 years and above in the country; this number in 2001 was 13.9%. The society is getting older because of progress in longevity as well as emigration (country is losing people mainly in the age group 15-45). It is likely that (assuming no big new developments would happen) number of adolescents and young people will be smaller in 2025 in Lithuania while those of 60-70 years old will sharply increase.

Figure 82. Population by age



Source: Statistics Lithuania

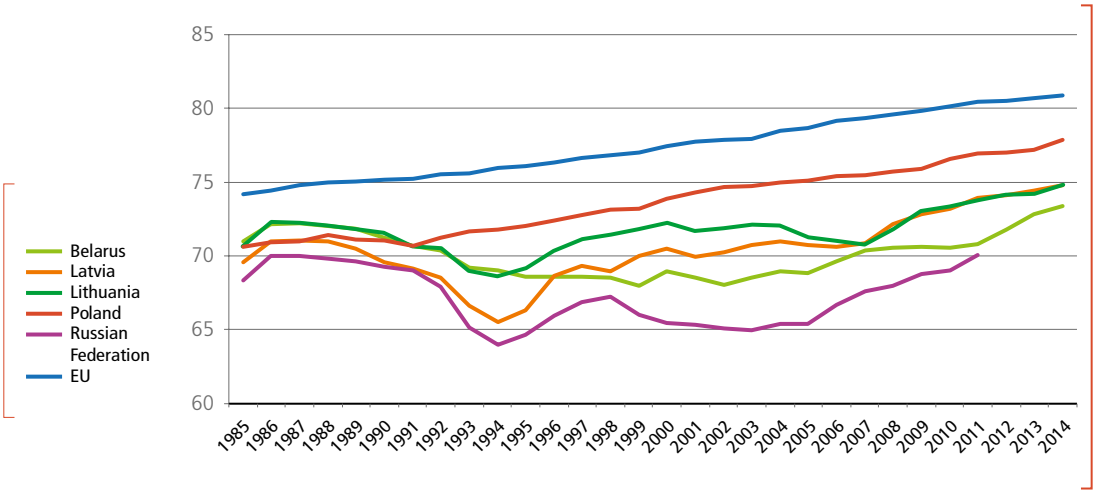
Figure 82 shows changes in the population structure by age groups.

Trends in Health: countries Lithuania has border with

Life expectancy of Lithuanian population has been studied in previous chapters. The picture reflecting Lithuanian figures in comparison to countries Lithuania has border shows that during period 1985 2014 dynamics of health in Lithuania has been:

- Behind Poland as well as EU average.
- Very close to Latvia.
- Somehow better in comparison to Belarus and Russia.
- There is quite clear trend of divergence between EU and countries of former Soviet Union reflected on the chart.

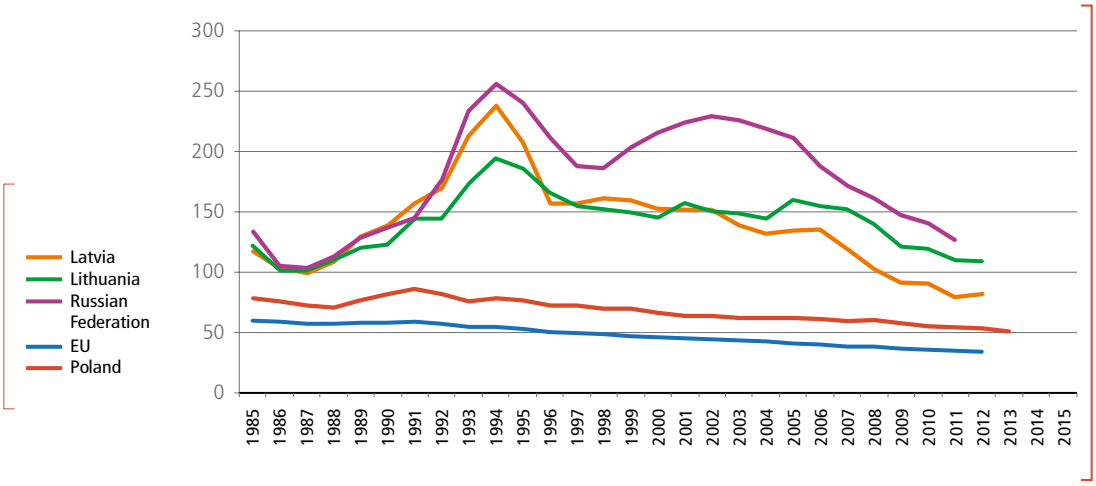
Figure 83. Comparison of life expectancy at birth (years) in Lithuania and in neighbouring countries



Source: WHO HFA Database

Divergence is even more clear looking to statistics of mortality because of external causes.

Figure 84. Comparison of mortality related to external causes in Lithuania and in neighbouring countries, SDR per 100000

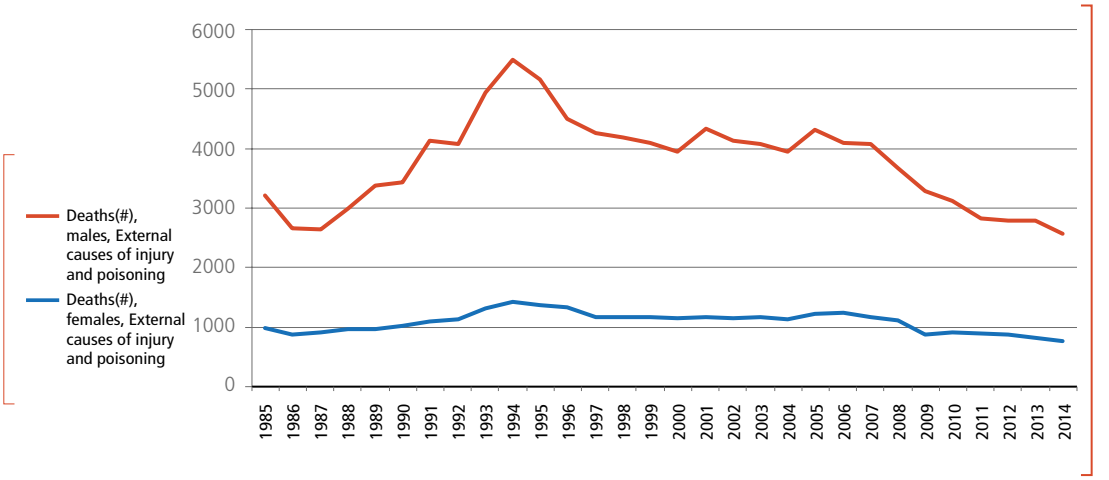


Source: WHO HFA Database

It looks like after the collapse of Soviet Union for about 15 years (1990-2005) issues other than health and life preoccupied public policy in Latvia, Lithuania, Russia. Period of initial accumulation of capital was revelling neglect to human dignity common to Western Europe or Americas decades ago. Improvement of

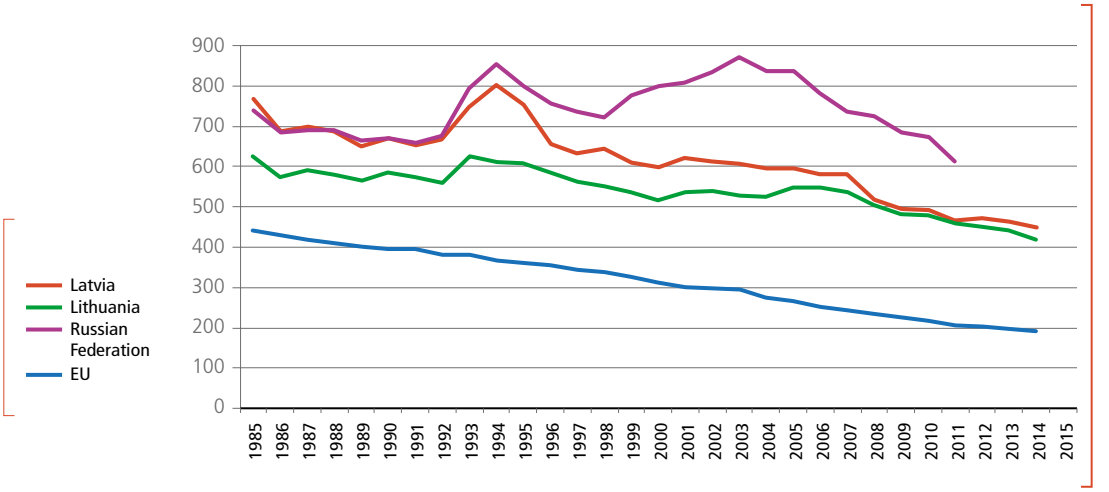
violence related health in these countries since 2005 is obvious (certain successes in managing traffic accident related mortality have been described in previous chapters), but a lot needs to be achieved for converging with "Old" Europe. Lithuanian statistics show that men are the main risk group regarding violence related mortality.

Figure 85. Deaths related to external causes, persons, Lithuania



Source: WHO HFA database

Figure 86. Mortality related to diseases of the circulatory system (SDR) in Lithuania and in neighbouring countries, SDR per 100000



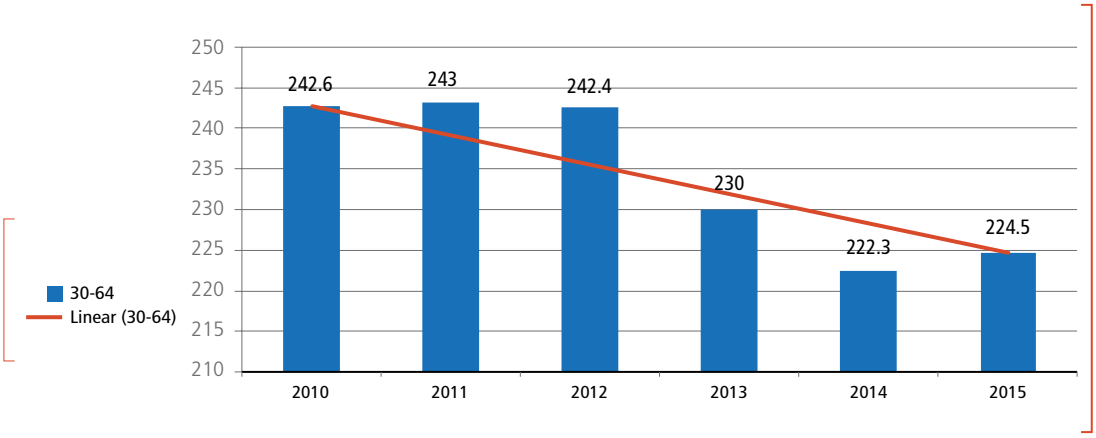
Source: WHO HFA database

In contrast with mortality related to external causes Latvia and Lithuania have not experienced hike in mortality related to diseases of the circulatory system

during years 1990-2005, but the progress has been minimal thus a gap between Lithuania and EU in 2014 is much bigger in comparison to the gap in 1985-1990.

There are some indications that improvement in the field of managing diseases of the circulatory system are coming what regards health of working age population (see *figure 87*), but the time series is too short to conclude that an improvement is sustainable.

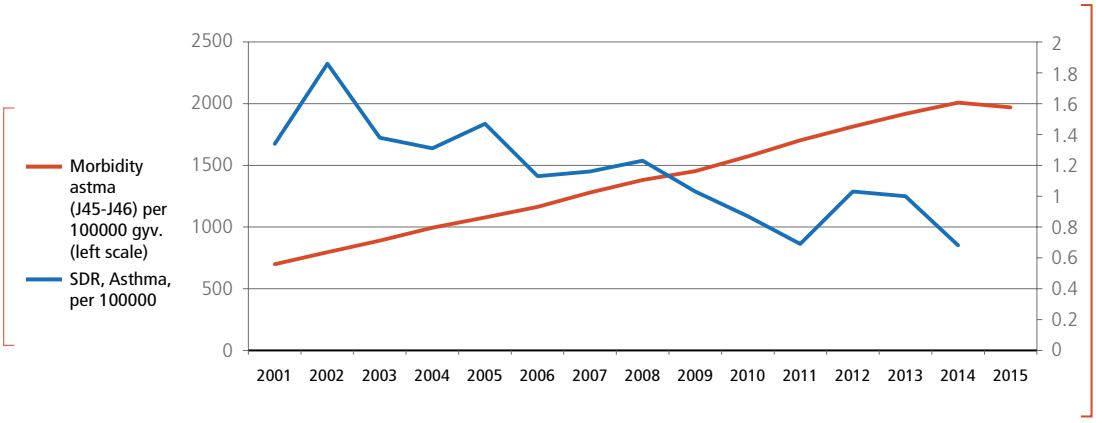
Figure 87. Mortality related to diseases of the circulatory system per 100000 population at age 30-64, Lithuania



Source: WHO HFA database

Health statistics related to management of asthma is an example modern health technologies worked well for Lithuanian patients.

Figure 88. Management of asthma patients, Lithuania

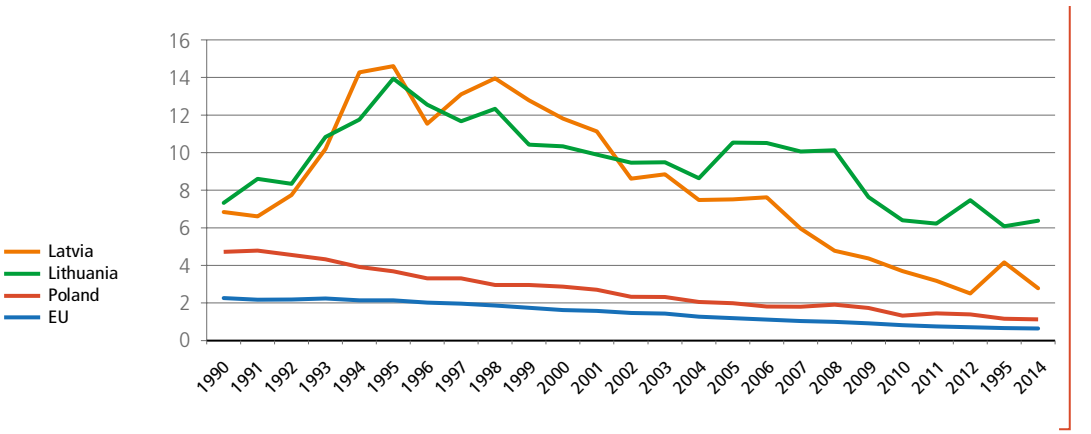


Source: Institute of Hygiene

Epidemiological patterns and improved diagnostics have resulted in constant growth (period 2001-2015) of morbidity figures. On the other hand, mortality

(SDR) is constantly declining and the disease stopped to be considered as a serious life endangering problem in Lithuania. There is a long way to go for the similar outcome what regards tuberculosis (see *figure 89*).

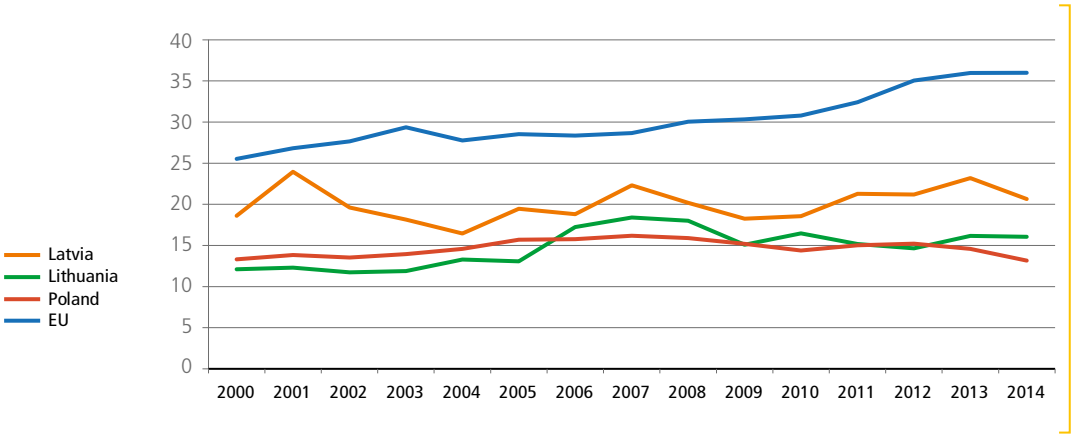
Figure 89. Management of tuberculosis, Lithuania and neighbouring countries, SDR per 100000



Source: WHO HFA database

There are statistics indicating that countries of New Europe are in some aspects of development outperforming EU average. Unfortunately (for authors of the study) these examples are rare or as in case with mortality related to mental disorders, likely, presenting stigma but not a leadership in management of the disease. It is somehow strange that probability to die from mental disorder in Lithuania and Poland is 2 times lower in comparison to EU average.

Figure 90. Mortality related to mental disorders, diseases of nervous system in Lithuania and in neighbouring countries, SDR per 100000



Source: WHO HFA database

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