

# Health Forecasting in Europe

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## SUMMARY

*The primary goal of this paper is to summarise the main health forecasting methods of the WHO, the OECD and the European Union. The paper is divided into four sections. First, the main concepts are clarified, and then the methods, tools and techniques are explained. Finally, the EU health strategy 2008-2013 and the health policy responses to the financial crises of 2008-2009 are characterised.*

*Keywords: health forecasting methods; health forecasts; health policy*

*Journal of Economic Literature (JEL) code: C10, C50, I18, I19*

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## INTRODUCTION

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Prediction of the future is an area of growing interest nowadays. The actors of planning, strategic management and decision making use a wide range of forecasting methods and tools for their work. Due to the development of scientific and technical background, a wide range of these methods and techniques, such as simple regressions, simulations, econometrics and complex forecasting methods, are available to decision makers. They want to know the effects of their actions; what type of influences the regulations, laws, programs and different plans will exert on the population. In health strategy planning they can identify the disparities in health outcomes caused by different political decisions by means of forecasting techniques. The policy makers need information about key health trends and changes for the planning processes, such as the changes in tendency of disease burdens and health expenditures.

## THE MAIN CONCEPTS OF FORECASTING

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Planning, monitoring and controlling are the three key elements of management (Shipp 1989). Planning is the most important of these because the health services necessary for the population can only be provided through precisely defined health goals, plans and programs. Planning represents what is to be done and what decisions have to be made now to achieve the concrete goals in the future. Therefore, the decision makers need information about the future effects of their present decisions (Shipp 1989).

Based on the Encyclopaedia Britannica, economic forecasting is “the prediction of any of the elements of

economic activity.” “... they describe the expected future behaviour of all or part of the economy and help form the basis of planning.” “... Formal economic forecasting is usually based on a specific theory as to how the economy works.” “... economic theory may determine the general outline of a forecast, judgement also often plays an important role. A forecaster may decide that the circumstances of the moment are unique and that a forecast produced by the usual statistical methods should be modified to take account of special current circumstances. This is particularly necessary when some event outside the usual run of economic activity inevitably has an economic effect.” (Encyclopaedia Britannica 2012: Economic forecasting)

According to Garrett (1999) forecasting means numerous realizable or probable futures of quite high degrees of probability.

Forecasting models consist of a large number of equations which are used to represent the relationships between different variables (Wall 2003). There is a wide range of forecasting methods which can be used by decision makers. We can forecast almost everything; therefore it is very important to follow five major steps in the forecasting process (Ozcan 2009):

1. to determine the goal of the forecast and to identify the necessary resources for the implementation,
2. to determine the time horizon of the forecast,
3. to select an appropriate forecasting technique and model in accordance with the financial resources of the organization and the complexity of the problem examined,
4. to conduct and complete the forecast: using the appropriate data and making the accurate assumptions based on the experience with a given situation. In forecasting the appropriate data means the availability of relevant historical

- data and recognition of the variability in a given data set,
- to monitor the accuracy of the forecast.

## FORECASTING METHODS, TOOLS AND TECHNIQUES

We can find a large number of forecasting methods and tools in the literature. The following is an overview of the most important forecasting methods and tools used in health policy decision making.

The first categorisation is based on the work of Garrett (1999). This work provides a comprehensive study about the health forecasting methods and applications of futures techniques in health in general. Based on this work, the forecasting methods can be grouped into three main categories (Garrett 1999):

- quantitative methods involving trends, projections and extrapolations;
- qualitative and normative techniques based on subjective judgements and expert opinions;
- multi-optional, causal or systemic methods.

This grouping is just one possible way of categorization. Table 1 shows the general relationship between the functions and tools but these relationships are not one-to-one relationships.

In Table 1 we can see that most of the functions (e.g. Soliciting experts and opinion, Developing consensus, Analysing, Scanning, etc.) can be performed with one of the numerous tools (e.g. Delphi method). A single function (i.e., Soliciting experts and opinion) often requires several different tools (e.g. In-depth interviews of experts, Genius forecasting, Surveys, Idea generation, etc.). Several tools and methods can be used to perform more than a single function.

In forecasting the following functions are used frequently (Garrett 1999):

- Soliciting experts and opinion:** The goal is to obtain ideas or judgements from people outside the core group. Expert judgements might be the oldest methods of forecasting. The experts are persons whose opinions considerably influence the expectations, their viewpoints are valuable within a particular sector, they possess a great deal of experience and their professional reputations are recognized by the professional community.
- Generating ideas:** The goal is to collect and imagine many alternatives. A creative way of thinking is formulated during most of the futures activities.
- Developing consensus** is composed of many expert opinions to make a decision.
- Analysing:** clarifying and explaining the structure, function and relationships of a system.

- Scanning:** observation and monitoring the future trends and new developments that may influence the future.
- Projecting** means “moving from the present into the future”.
- Making judgements** means “weighing alternatives and determining their consequences”.
- Empowering** stands for “helping people to shape their future”.

Further characterisation and description of the tools and functions can be found in Garrett (1999).

*Table 1*  
*General relationship between functions and tools*

Tools	Functions							
	Soliciting experts and opinion	Generating ideas	Developing consensus	Analysing	Scanning	Projecting	Making judgements	Empowering
In-depth interviews of experts	xxx			x	x	x	x	
Genius forecasting	xxx			x	x	x		
Surveys	xxx		x	x	x	x	x	
Delphis	xxx		xxx	x	x	x	xxx	
Brainstorming		xxx						x
Checklist		xxx						
Attribute listing		xxx						
Morphological analysis		xxx						
Idea generation	x	xxx					x	
TKJ method	x	xxx	xxx				x	x
Quality circles	x	xxx	xxx				x	x
National group method	x	xxx	xxx				x	
Colour-based tools	x	xxx	xxx				x	
Structural analysis matrix				xxx		x	x	
Actor interviews and surveys	x			xxx	x			
Role playing		x		xxx		xxx		x
Actor analysis and political mapping				xxx		xxx		
Simulation games		x		xxx		xxx	x	x
Time-space grids		x		xxx	x	xxx		
Futures wheels		x				xxx		
Statistical analysis				xxx		xxx		
Environmental scanning					xxx			
Trend impact analysis						xxx		
Cross impact analysis						xxx		
Guided imagery		x				xxx		xxx
Relevance trees and paths							xxx	
Cost benefit and risk analysis							xxx	
Multi-objective, multi-criteria decision-making							xxx	
System dynamics modelling				xxx		xxx		
Econometric modelling				xxx		xxx		
Optimisation modelling				xxx			xxx	

Explanation: xxx- major functions of this tool, x- one possible function of this tool.

Source: Garrett 1999, pp. 130-131

Another way of grouping is based on Ozcan (2009). Five categories of forecasting methods are determined by Ozcan:

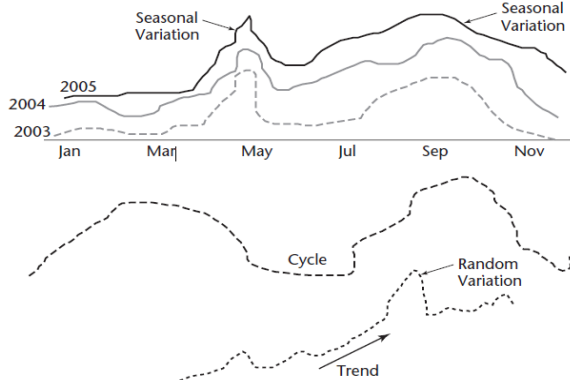
### *Judgmental Forecasts*

Judgemental forecasts are based on subjective executive opinions, consumer surveys, mental estimates of the market, intuition and the opinions of the managers and the staff. Judgemental forecast methods include:

- the Delphi method, which obtains the opinions of managers and staff who have relevant knowledge;
- the jury of executive opinion model uses the consensus of a group of experts, often from several functional areas within a health care organisation, to develop a forecast.
- naive extrapolation involves making a simple assumption about the economic outcome of the next period or a subjective extrapolation from the results of current events.

### *Time-Series Approach*

Mathematical and statistical techniques use historical data called time series. A time series is measured at regular intervals such as daily, hourly, weekly, monthly or yearly. A forecast which is based on time-series data assumes that future values of the series can be predicted from past values. The behaviour of the series in terms of trend, seasonality, cycles, irregular variations or random variations can be identified by analysis of time series.



Source: Ozcan, 2009

Figure 1. Characteristics of seasonal variations

Figure 1 illustrates these terms. As we can see, seasonality refers to short-term and relatively frequent variations caused by factors such as weather, holidays, and vacations. Health care facilities often experience weekly and even daily ‘seasonal’ variations. The regular (e.g. daily, weekly, monthly or annual) fluctuation of data is called a cycle. Cycles often behave like business cycles. Random variations are residual variations that are

caused by unforeseen circumstances such as wars, accidents, etc.

### *Techniques for Averaging*

These techniques make the smoothing of data possible. Using this technique, the forecast will be less variable than the original data set. Four techniques of averaging are described in this section: naive forecasts, moving averages, weighted moving average and single exponential smoothing.

Naive forecasts are the simplest forecasting technique. This method can be applied for a data set that exhibits seasonality or a trend. Its major weakness is that it cannot be used to make highly accurate forecasts because it simply projects the actual value of the previous period for any other period and does not smooth the data.

Moving average forecasts are updated by adding the newest value, dropping the oldest and then recalculating the average. The forecast ‘moves’ by reflecting the recent values. The average data points are fewer in number; therefore, the moving averages will be smoother, but less responsive to real changes. Health care managers have to face a problem in selecting and determining an appropriately reasonable number of periods for the moving average forecast. The selection depends on the number of the available periods as well as on the behaviour of the data.

The weighted moving average is similar to a moving average and – like it – is easy to calculate. All the values are weighted equally but the weighted moving average assigns more weight to the most recent values in a time series.

In single exponential smoothing each new forecast is based on the previous forecast plus a percentage of the difference between that forecast and the actual value of the series at that point, expressed as:

$$\text{New forecast} = \text{Old forecast} + \alpha (\text{Actual value} - \text{Old forecast}),$$

where  $\alpha$  is the smoothing constant, expressed as a percentage of the forecast error. (Ozcan 2009)

### *Techniques for Trend*

Data trends can be determined from time series. “Trend is a longer run direction of change which can be seen in time series data. A clear trend can be used to predict some future changes.” (Wall 2003: 311)

Kerékgyártó et al. (2007) identify two basic types of trend methods: (1) moving averages and (2) analytical methods. Analytical methods include the following: linear function, exponential function, hyperbolic and logistic functions.

According to Ozcan (2009), a trend is a gradual, long-term movement and it can be linear or non-linear

(Ozcan 2009). Techniques for trend are further grouped by Ozcan (2009) in the following way:

Linear regression as a trend line method is often used for describing trends in health care data. The independent variable  $x$ , takes a value in time and is shown as  $t$ , and the equation is represented as:

$$y = a + b \cdot t,$$

where  $y$  = the predicted (dependent) variable,  $t$  = the predictor time variable,  $b$  = slope of the data line,  $a$  = value of  $y$  when  $t$  is equal to zero.

Trend-adjusted exponential smoothing can be used when a time series exhibits a trend. If the data exhibits a trend, simple smoothing forecasts can reflect it accurately. Trend-adjusted smoothing would be preferable to simple smoothing if the health care manager detects a trend in the data after the graphing. A single exponential smoothing with trend (SEST) forecast has two components: smoothed forecast (SF) and trend (T). The formula for SEST for the next period,  $t + 1$ , can be written as:

$$\text{SEST}_t = \text{SF}_{t-1} + \text{T}_{t-1},$$

where

$$\text{SF}_{t-1} = F_{t-1} + \alpha (A_{t-1} - F_{t-1}),$$

the previous period's forecast + smoothed error, and

$$\text{T}_t = \text{T}_{t-1} + \beta (F_t - F_{t-1} - \text{T}_{t-1}),$$

i.e., the previous period's trend + smoothed error on trend.

### *Techniques for Seasonality*

The analysis of seasonal variations is a very important factor in planning. Seasonality plays an important role in the planning capacity of systems. Seasonal variations mean daily, weekly, monthly, or other regularly repeated movements (upward or downward) in a data set. Seasonal variations in a data set deviate from the average series value. Seasonality models can be either additive or multiplicative models. In the additive model, seasonality is expressed as a quantity, in the multiplicative model as a percentage of the average amount. The seasonal percentages are referred to as seasonal indices. The use of the multiplicative model is more frequent than that of the additive model. If time series data encompass trend and seasonality, the health care manager can decompose the seasonality by using seasonal indices to get a clearer picture of the trend. Ozcan (2009) distinguishes the following seasonal indices techniques: quarterly indices technique, monthly indices technique and daily indices technique, employing seasonal indices in forecasts.

### *Accuracy of Forecasts*

According to Ozcan (2009), the complex nature of most variables makes correct forecasting regarding the future values of the previously mentioned variables almost impossible. In his opinion, errors may be caused by using an inadequate forecasting model or an improperly used technique. Forecasting errors can occur if they are caused by irregular variations beyond the manager's control, and even random variations in data can have the same effect. A forecast error equals the actual value minus the forecast value:

$$\text{Error} = \text{Actual} - \text{Forecast}$$

Two aspects of forecast accuracy have the potential to influence a choice between forecasting models. The first one is the historical error performance of a forecast model and the second is the ability of a forecast model to respond to change. Two commonly used measures of historical errors are the mean absolute deviation and the mean absolute percent error.

### *Forecast Control*

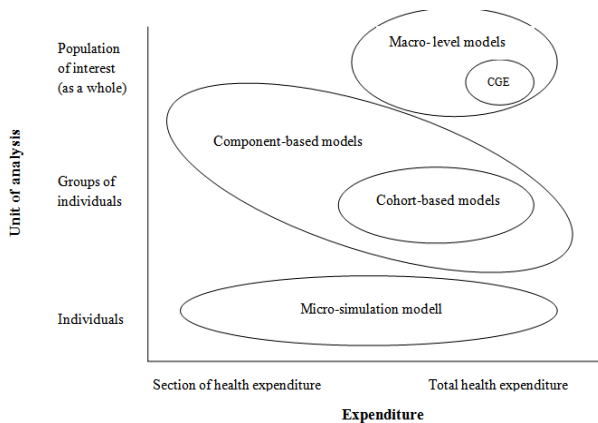
A health care manager must ensure that the forecasting methods function properly and provide consistent results. A variety of reasons can lead to the forecasts getting out of control, such as changes in trend behaviour, cycles or new regulations that affect demand. (Ozcan 2009)

## AN OECD COMPARATIVE ANALYSIS OF FORECASTING METHODS

This study reviewed 25 models that were developed for health policy analysis in OECD countries by governments, research agencies, academics and international organisations. Working groups identified the following classes of models: micro-simulation models, component-based models, macro-level models and combined models (Astolfi et al. 2012a).

This comparative analysis identifies and classifies current health expenditure forecasting methods and presents the advantages and disadvantages of the methods. Based on Astolfi et al. (2012a), forecasting models are considered as either predictive or policy-oriented. Predictive accuracy is reasonably feasible over a short period of time where the probability for policy intervention to alter the future course of events is low. The aim of policy-oriented health expenditure forecasting models is to inform policy makers about when and how to implement reforms and what effects those reforms are likely to have. Most of the models that the study reviewed use a long-term horizon (from 30 years to 75

years) and only a few models use a medium-term time horizon (from 5 years to 15 years).



Source: Astolfi et al, (2012b):121

Figure 2. Classes of forecasting models

In Figure 2 we can see the classes of forecasting models that are based on OECD research. The forecasting models can project health expenditure on the levels of individuals, groups of individuals or a community. At the same time models can focus on specific sections of health expenditure, such as public expenditure, social security, private insurance and others. The higher the level we make analyses at, the higher the level of aggregation is, as shown by Figure 2.

We can distinguish three main categories of health expenditure forecasting models based on the level of aggregation of the analysed units and the level of detail of health expenditure to be projected.

### *Micro Simulation Models*

Micro-simulation models simulate different policy scenarios related to prevention, treatment and the organisation and financing of care. They also examine results forecast by different characteristics included in the model, such as diseases, age-groups, providers or treatments. For the analysis the units are provided by the individuals. Individuals can be aggregated into policy-relevant groups and analysed using relevant indicators, such as inequality and poverty indices.

### *Component-Based Models*

Component-based models are the most dominant group. These models forecast health expenditure by component, such as financing agents, providers of care, goods and services consumed, groups of individuals or some combination of these groups. The models often consist of different layers when expenditures are grouped by financing agents. Each layer may use a different technique to project a sub-component of health expenditure. A major sub-class of component-based models is represented by cohort-based models where

individuals are grouped into cells according to several key features. The stratification of population can be made based on the interest of the population, generally into five-year age cohorts.

Further classifications can be made by sub-dividing the cohorts according to other commonly-used attributes (such as gender, health status, and proximity to death). These models are often identified with actuarial models or cell-based models. In such models, “The cell identifies the subcategories into which each cohort is divided. Each cell is associated with an average cost of health goods and services. Actuarial projections allow predicting the likely evolution of the population and therefore the future number of individuals included in each cell of the model. Future health expenditure is determined by multiplying the average costs by the projected number of individuals included in each cell.” (Astolfi et al. 2012a: 3)

Cohort-based models are getting popular over the years because their implementation and maintenance tends to be simple, it is relatively inexpensive and the impact of policy changes can be assessed easily by simply modifying the policy parameters. They need less data than micro-simulation models.

### *Macro-Level Models*

These types of models focus on forecasting the total health expenditure and include analyses of time-series and cross-sections of aggregate indicators. These models are the most appropriate to use for short-term projections in case of clear and uninterrupted trends and in the absence of structural breaks. Astolfi et al. explain that “Econometric regression analysis is used to fit time-series data. Projections can be based on pure extrapolation of the statistical models fitting the data or they can be based on the projected values of the critical explanatory variables, whenever included.” (Astolfi et al. 2012a:3)

This class of models includes computable general equilibrium (CGE) models, which are a special category of macro-models. These models attempt to connect health expenditure growth to its impact on the overall economy and identify what the long-term determinants of medical spending growth are. Macro-level models require the least data because these are complex models and require strong assumptions about the behaviour of individuals, firms and governments.

Combined-models are a new approach to forecasting models. These models provide more improved tests of policy scenarios to understand the broader social and economic implications of policy changes. (Astolfi et al. 2012a)

## **DRIVERS OF HEALTH EXPENDITURE**

The main determining factors of the drivers of health care expenditure are summarised by the OECD study. The study shows that the main determinants of health

expenditure growth vary according to the time horizon of the projection (Astolfi et al. 2012a):

1. In the short term, expenditure growth is strongly linked to government budget decisions.
2. In the medium term, technological changes play an important role in explaining growth.
3. In the long term, risk factors such as obesity and changes in the prevalence of chronic diseases play an important role in explaining growth.

The determinant factors of health spending growth can be grouped into three categories (Astolfi et al. 2012a):

1. demand-side factors, such as demographic factors and health status, income, consumers' behaviour,
2. supply-side drivers, such as technological progress, changes in treatment practices, health prices and productivity,
3. regulatory factors, such as institutional characteristics of health systems and their financing.

## THE EU HEALTH STRATEGY 2008-2013

The European Commission adopted a new Health Strategy in 2007, published in *Together for Health: A Strategic Approach for the EU 2008-2013*. This strategy provides a strategic framework that deals with the main questions and problems regarding health in Europe. The strategy is based on a value-driven approach that is based on understanding health and the health systems. As we know, there is a relationship between the health status of the population and economic growth, therefore, the health factor is a main driver of economic growth.

The main goal of the EU Health Strategy (2008-2013) is to give direction to future EU activities in health. Member States have the main responsibility for providing healthcare to European citizens and defining health policy. The role of the European Commission (EC) is to promote cooperative action, particularly relating to health threats and issues with a cross-border or international impact and the prevention of illnesses.

The EU's principal action in the area of health started in the 1990s. "Initially, the EU worked on eight sectoral health programmes that addressed individual issues such as cancer, communicable diseases, rare diseases, injury prevention, pollution related diseases, drug prevention, and health promotion and monitoring." (PHEIAC 2011:20)

In 2000, the European Commission adopted the first public EU Health Strategy for the period 2003-2007. In 2006, the Commission acknowledged that Europe was

facing new health challenges relating to globalisation, innovative technologies, an ageing population, new disease threats, and lifestyle-related illnesses that required a new approach. A new strategy dealing with this issue was presented in 2007 in a White Paper (2008-2013). Within this framework, the Strategy was structured around four core principles and three strategic objectives. (PHEIAC<sup>1</sup> 2011)

### *EU Health Strategy's Principles*

Principle 1: A strategy based on shared health values that mean universal access to good quality care and respecting the social values and norms of security and solidarity.

Principle 2: "Health is the Greatest Wealth", which means a healthy population is a requirement for economic productivity and prosperity. Therefore, it is important to understand the economic relationships between health status, health investment and economic growth.

Principle 3: Health in All Policies: Community policies play an important role in the population's health in general. Therefore, it is important to develop synergies with other sectors such as environment policy, social policy, tobacco taxation, regulating pharmaceuticals and food products, trade, ICT, etc. in order to achieve the stipulated objectives.

Principle 4: "Strengthening the EU's Voice in Global Health": maintaining collective leadership in global health in order to achieve improved health outcomes for EU citizens and others plays a key role in EU Strategy.

The health of the population plays a vital role in EU policies. The objective of the EU is to reposition health in all policies in a global context. The strategy focuses on three strategic issues:

Objective 1: "Fostering good health in an ageing Europe"

This includes actions that promote health and prevention of diseases through tackling issues such as nutrition, physical activity, alcohol, drugs, tobacco, environmental risks, genetic disorders, and injuries in all settings to help promote a healthy and productive population that ages healthily.

Objective 2: "Protecting citizens from health threats"

The EC will also focus on new challenges coming from globalisation, such as pandemics, global biological incidents, climate change and bioterrorism.

Objective 3: Supporting dynamic health systems and new technologies

New technologies can help to improve the prevention of illnesses, delivery of treatments, and support a shift from hospital care to prevention and primary care, they can lower the costs of the healthcare system, facilitate patient mobility, etc.

<sup>1</sup> *Public Health Evaluation and Impact Assessment Consortium*

## Action Areas of EC Outputs

Table 2 shows the most common EC action areas in relation to the EU Health Strategy. These actions are based on objectives or principles.

Table 2  
EC outputs by action area (2008-2010)

Action area	Objective or Principle under which the majority of actions in this action area fall	Number of actions	% of total
Health information	Principle 1	16	11.7
Disease (communicable, pandemic)	Objective 2	13	9.5
Disease (common, rare, chronic)	Objective 1	10	7.3
Bilateral health governance	Principle 4	10	7.3
Global health governance	Principle 4	8	5.8
Health technology/e-Health	Objective 3	7	5.1
Health in all policies	Principle 3	6	4.4
Patient safety	Objective 2	5	3.6
Nutrition and PA	Objective 1	5	3.6
Tobacco	Objective 1	5	3.6
Alcohol	Objective 1	4	2.9
Environment/climate change	Objective 2	4	2.9
Health inequalities	Principle 1	4	2.9
Pharmaceuticals	Objective 3	4	2.9
Medical devices/medicines	Objective 3	4	2.9
Health economics	Principle 2	3	2.2
Health workforce	Objective 3	3	2.2
Transport	Principle 3	3	2.2
Healthy ageing	Objective 1	2	1.5
Mental health	Objective 1	2	1.5
Health security	Objective 2	2	1.5
Agriculture	Principle 3	2	1.5
Organ donation/transplantation	Objective 1	2	1.5
Regional health governance	Principle 4	1	0.7
Children and young people	Objective 1	1	0.7
Energy	Principle 3	1	0.7
CBRN	Objective 2	1	0.7
Patient rights	Principle 1	1	0.7
Health services	Principle 3	1	0.7
Injury prevention	Objective 1	1	0.7
Other	Various	6	4.4
Total			137

Source: Commission of the European Communities (2007)

## HEALTH POLICY RESPONSES TO THE FINANCIAL CRISIS

The crisis has had a substantial negative effect on the financial resources of the health system but at the same time the demand for health services increased. In this period three main challenges were identified by the policy makers due to the economic shocks (WHO Reg. Office, 2012):

1. The decision makers require more predictable sources of revenue for their planning and they need more accurate projections. The investments, the budgets and the procurements of goods and services, the human resources and the potential expenditures should be determined in a more reliable way. The unexpected effects of economic shocks endanger sustainable health

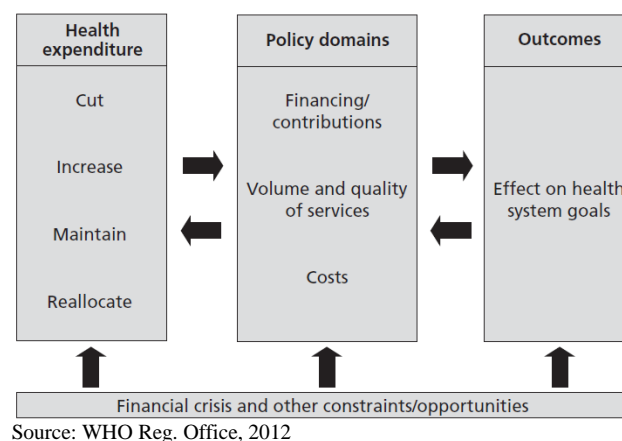
systems because of the elimination or significant reduction of the revenue the demand for financial resources dramatically increases.

2. The health system is a dynamically developing industry; therefore, its needs for sources of revenue are increasing rapidly. For both the individuals and the society, health has become the most important issue. However, economic growth depends on the general health status of population, so the decision makers have to take into consideration the determinant factors of health and should promote those action plans that support our health. The determinants of health are summarized by Dahlgren and Whitehead (2007). Hence the financial resources for these action plans should not be reduced even if the resources are scarce.
3. An unequal distribution of resources would injure the essential social norms and damage the equitable and reasonable access to care and quality of care; it would increase the costs and expenditures in the long term that would aggravate the existing budgetary deficit and contribute to health disparities.

International organisations such as the WHO, OECD and the European Union have adopted general guidelines for the member states related to health policies.

### WHO's Regional Committee for Europe

In 2009, the WHO's Regional Committee for Europe adopted a resolution (EUR/RC59/R3) and drew the attention of the Member States to the need to continue to protect and promote universal access to effective health services during a time of economic crisis.



Source: WHO Reg. Office, 2012

Figure 3. Health policy responses to the financial crisis and other economic shocks

Figure 3 shows the possible health policy responses to health system shocks. In the framework of the WHO three main dimensions were determined which can be seen in Figure 3: health expenditure, policy domains and outcomes. In the first dimension when the health decision



makers were confronted with an economic shock, a decision had to be made to change the rate of public expenditure on health.

Secondly, the policy tools for changing the expenditure levels can be classified into three main policy domains:

1. The level of contributions for publicly financed care: national health budget, social insurance contributions, aspects of fiscal policy such as allocating taxes for health, private expenditure on health and the private health insurance fee, etc.
2. The volume and quality of care financed by the public: the statutory benefits package, population coverage, waiting times, etc.
3. The cost of care financed by the public: the price of medical goods, health worker salaries, payments to providers, overhead costs, etc.

Thirdly, the impact of any proposed reforms for the desired health goals must be taken into account by the policy makers in the course of planning. Several goals can be identified by the decision makers, such as improving health outcomes, ensuring equal access to health services, maximising health gain from given resources and avoiding waste, and providing reliable information about features of the health system such as benefits, costs and quality.

The key message of the WHO work is that the policy makers have to handle the policy tools carefully. A difference has to be made between the policy tools that promote health system goals and those that put the health system at risk. If unexpected events require politics to reduce the financial resources and public spending on health, the negative effects on the health system operation and performance must be minimised and reforms must be carried out that will increase the efficiency of the health system in the long term.

## DISCUSSION

Encyclopaedia Britannica and the literature related to health economics clearly define the terms of forecasting and economic forecasting. All forecasting activities are connected somehow with planning processes, policies or decision making. There are several forecasting methods, tools and techniques that are available for decision makers. Depending on which are applied by policy

makers, they will influence the scenarios and decisions. There is a growing demand for more reliable forecasting; therefore, there is a need to identify the main determinant factors of health and to take economic, environmental, technological, social and geopolitical risks into consideration (World Economic Forum 2012). The rapid development of computer technology and the acceleration of information and data transfer also have had positive effects on the reliability and accuracy of forecasting. Qualitative forecasting methods and tools have increasingly greater importance among the forecasting methods.

The WHO, the OECD and the EU place great emphasis on improving the health of the society. Since the European countries have different historical backgrounds, cultural values, economic progress etc., the focus of policies can be different. The EU goal is to improve health in all policies with several tools and action plans and to provide guidelines for policies to achieve better health outcomes.

The global financial crisis has set a new challenge for the decision makers and the use of forecasting methods has become appreciated. At the beginning of the crisis the EU composed a strategy focused on health improvement because it is an important driver of economical growth. The health sector is a dynamically developing industry; therefore it requires ever more financial resources. The health policy responses to the crisis were examined closely by the WHO and produced the following results. In the countries which had financial reserves, a clear health strategy and well-defined long term health goals, the health system's sustainability and the health system goals were less damaged by the economic crisis. Estonia was mentioned as an excellent example of the countries well-prepared for the economic crisis.

Another key message of the WHO work is that the policy tools have to be used more carefully by policy makers. Distinction must be made between the policy tools that promote health system goals and those that risk the health system. If the decision makers face an unexpected shock, they must consider several policy options for the short and long terms. They should choose measures which promote the efficiency of the health system and health status in the long term. Furthermore, the goal of the decision makers is to take measures which avoid or decrease the negative trends and improve the positive effects in the long term.

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