

FORECASTING MODEL

1 - FORECASTING APPROACH

◀ Belgium

The Belgian forecasting model looks at **both demand and supply** of health workforce:

- *The model estimates trends in the supply of health workforce, factoring in multiple scenarios regarding various levels of inflows in the workforce;*
- *On the demand side the model takes in consideration the evolution of demand based on health expenditures and the ageing of the population.*

IN DETAILS:

Essential in the correct functioning of the Belgian forecasting model is a precise definition of this **starting stock**. Exact information about size and composition of the current workforce is a sine qua non condition for reliable forecasting.

This starting stock is then modified by **inflow and outflow**. In a workforce model, inflows are defined as new graduates entering the labor pool, immigration, extra flows (e.g. people entering health sector from other sectors mid-career). Outflow is determined by survival rate, halting of activities, emigration, etc. Expected evolutions about future inflows (e.g. education and migration) and outflows (e.g. emigration and retirement) of the profession and future level of activity are used to forecast the future levels of the (active) workforce.

In combination with the projected population evolution, the Belgian forecasting model also produces expected densities (number of health professionals per 1000 inhabitants).

FOR FURTHER INFORMATION:

- http://www.health.fgov.be/eportal/Healthcare/Consultativebodies/Planningcommission/18070759_FR
- http://www.euhwforce.eu/web_documents/JAHWF_130521_WP6_workshop/JAHWF_130527_WP6DOC_Eindproduct_FR_Gegevenswoordenboek_geharmoniseerdeplanningsmodel080526.pdf
- *“Belgian Harmonized Mathematical Planning Model (BHMPM)”, Pieter-Jan Miermans.*



◀ Denmark

The quantitative forecast includes a **supply side** and **five very simplistic scenarios for the demand side**, one scenario showing the demand for workforce if the current ratio between the profession and population size is being kept and four scenarios showing the expected demand for workforce increasing 0 %; 0,5 %; 1 % or 1,5 % per year.

The decision not to create a more elaborate demand forecast is primarily due to great difficulties associated with forecasting demand. When producing a five year plan setting either the number of postgraduate training posts for medical or dental specialists the Danish Health and Medicines Authority uses the results from the supply forecast and is furthermore advised by different stakeholders regarding their qualitative estimation of the need of medical or dental specialists in the different specialties on a national and regional level.

◀ England

The forecasting model looks both demand and supply of health workforce.

The forecasting approach is **different for the different professions** forecasted (110 different roles). However demand and supply are always take into account. Workforce planners model demand and supply variables and assess if the current training volume is likely to produce under or over supply if not adjusted.

Factors influencing **demand** include:

- *Changing patterns of disease;*
- *Developments in technology;*
- *Introductions of new professional or regulatory standards;*
- *Financial constraints;*
- *New roles substituting current roles.*

Factors influencing **supply** include:

- *Current workforce levels;*
- *Rates of attrition from training courses;*
- *Rates of staff turnover;*



- Retirement age;
- Inflow and outflow from other countries and healthcare employers.

◀ Finland

The forecasting model follows a **need based approach** and produces demand side projections regarding demand for new labour for 28 industries and occupational groups in each of them as well as supply side projections for intake needs in different fields and levels of education.

The **macroeconomic forecasting (VATTAGE model)** is based on projections of

- The employment rate;
- The GDP growth;
- The social security development.

The “**demand for labour**” forecasting (Mitenna model) is based on the projections regarding demand for new labour and takes into account the changes in the occupational structures of the industries, natural wastage, total supply of labour and the efficiency and effectiveness parameters (the completion rate, the proportion of multiple education, the labour force participation rate) for the education system.

FOR FURTHER INFORMATION:

- The **VATTAGE** is a model used in VATT, the Government Institute for Economic Research, to study the effects of tax policies and environmental policies on the economy. The model can also be used to study scenarios concerning the driving forces of economic growth and employment. See http://www.vatt.fi/file/vatt_publication_pdf/t150.pdf
- The **Mitenna** model provides long-term data on changes in demand for labour, natural wastage of labour, demand for skilled labour and educational needs. The anticipation process in the Mitenna model anticipates demand for and supply of labour in the target year and reconciles these factors. The anticipation method is divided into two sections. The first focuses on the needs of the world of work. This involves anticipation of demand for new labour, i.e. the amount of labour and the types of educational qualifications required by economic life over a certain anticipation period. The calculation consists of forecasts of changes in demand for labour and estimates of labour wastage. The second section concerns the supply of labour. New labour is mainly supplied by new young age groups. The unemployed labour force also adds to supply. In addition, supply of labour is influenced by labour force participation rates, i.e. the proportion of graduates entering the labour force. The effects of net immigration and age group forecasts are also taken into account in anticipation of the total supply of labour. Main phases of the anticipation process in the Mitenna model can be found in Figure 3, p. 20 in http://www.oph.fi/download/144754_Education_training_and_demand_for_labour_in_Finland_by_2025_2.pdf

◀ Norway

The Norwegian health and social personnel forecast model (**HELSEMOD**), developed by Statistics Norway, looks at **both demand and supply** of health workforce.

The **supply side** analysis include:

- *The size of the workforce in the health and social sector, register data reported annually to Statistics Norway;*
- *Average working hour for the health and social workforce;*
- *Number of students in health and social sciences, based on annual statistics from the register in the Ministry of Education and Research;*
- *The candidate production from educational institutions;*
- *The number of persons leaving the health and social labour marked because of death.*

The **demand side** analysis include:

- *Population size (the population is projected by age and sex at the national level up to and including the year 2100);*
- *Current utilisation patterns (multiple sources are used to disclose the current utilisation patterns);*
- *Changing utilisation patterns (the model only indirectly include the assumption that observed increase in utilisation of health services will continue in the projection time span as a part of general economic growth; progress as a result of new health technologies and research may entail higher demand in itself due to the new possibilities; on the other hand, improved health status in the general population may indicate that the need for health services does not increase as much as the rise in the number of for example elderly with high health care needs);*
- *Changes in health service delivery (some reforms are incorporated in the HELSEMOD 2012 model and in earlier version, for example the Coordination Reform which presumes that the municipalities will play an increasing part in meeting the growth in demand for health services; in order to include the reform into the analyses, Statistics Norway has assumed expansion of home nursing care, general practitioners, physiotherapy and in health promoting activities compared to the baseline alternative; another example is a long term national program to strengthen mental health care resulting in an increased supply of services, reflecting a former unmet need of mental health care);*
- *GDP/ health expenditure growth (the model assumes that positive economic growth will create higher expectations and utilisation of services beyond the impact of demographic changes).*

It is mainly applicable for planning purposes of future health personnel capacity to cope with health care needs in the population. It is not a prognosis, but an exercise in disclosing what happens 20 years ahead under certain conditions. The model is based on alternative projections based on different assumptions, and offers different scenarios (i.e. high, medium, low) for the different approaches. The baseline year for the most

recent projections is 2010, and the model projects the health care personnel needed towards 2035.

FOR FUTURE INFORMATION:

Roksvaag, K. and I. Texmon (2012), *Arbeidsmarkedet for helse- og sosialpersonell fram mot år 2035 [Helsemod- the labor market for healthcare personnel towards 2035]*, Report 14/2012, Statistics Norway, Oslo, available at http://www.ssb.no/emner/06/01/rapp_helse/rapp_201214/rapp_201214.pdf

◀ Spain

The forecasting model looks **both demand and supply** of health workforce.

The **supply** submodel was implemented for each of the 43 specialties, and separately for women and men, since the flows that affect the stock of specialists, emigration and immigration, drop-outs, productivity, mortality, etc., differ significantly by gender.

On the **demand** side, the model allows the analysis of the degree of sensitivity of the parameters that are most uncertain: population growth, and the growth rate for the demand of each specialty.

The model calculates the supply and the deficit or surplus.

◀ The Netherlands

The forecasting model looks both demand and supply of health workforce.

It allows to develop different scenarios using different hypothesis and it calculates the needed influx into specialist training (a specified range is calculated for each specialism).

- *The forecasting process starts out with estimating the present demand, expressed in FTE supply, by correcting the present demand with unmet demand or abundance of demand.*
- *Then, they make a projection of the demand 18 years later, by taking into account demographic, epidemiological, and socio-cultural developments mixed with policies.*
- *Based hereon, they develop different scenarios, using different estimates for efficiency, horizontal and vertical substitution, professional developments, and working hours changes.*



- For each of the scenario's, they calculate the needed influx into specialist training, given the expected retirement of the present supply, the supply in training at the moment, the immigration of specialists, the feminization, and the yield of the training.
- The experts decide on which of the scenarios are the most likely. This results in a specified range for the needed influx in medical training for each specialism.
- This range is presented to government with unanimous support from health insurance companies, training institutes, and professionals (<http://www.capaciteitsorgaan.nl/Portals/0/capaciteitsorgaan/publicaties/capaciteitsplan2010/0%20Capaciteitsplan%20Hoofdrapport%20Engels.pdf>).