

- FORECASTING THE DEMAND FOR THE HWF IN THE NORWEGIAN PLANNING SYSTEM

Reference information:

Norwegian Directorate of Health  
Pb 7000 St Olavs plass, 0130 Oslo  
Department of Education and Personnel  
Universitetsgata 2  
Web: [www.helsedir.no](http://www.helsedir.no)

Contact people:  
Øyvind Søetorp: [oyvind.soetorp@helsedir.no](mailto:oyvind.soetorp@helsedir.no)

Main aspects:

- *The Norwegian forecasting model covers a wide range of aspects;*
- *It is also a robust model;*
- *The model is based on alternative projections on different assumptions, and offers different scenarios (i.e. high, medium, low) for the different approaches. This makes the model quite flexible and can be used in different scenarios.*

Description:

The Norwegian health and social personnel forecast model (HELSEMOD) is developed by Statistics Norway. 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. It should be noted that HELSEMOD is the main Norwegian forecast model for health personnel, but there is also other registers and statistics used for planning purposes on national, regional and local level supplementary to the results of the HELSEMOD. This chapter however focuses on the HELSEMOD model.

The various factors of the demand side in health planning models are surrounded by a lot of uncertainties. The OECD distinguishes five different approaches to modelling the demand side, than can be commented based on the Norwegian experience:

1. *Population size;*  
.....
2. *Current utilisation patterns;*  
.....



3. *Changing utilisation patterns;*  
 .....

4. *Changes in health service delivery;*  
 .....

5. *GDP/ health expenditure growth.*  
 .....

◀ 1) Population size

Any model should include population size as a basic element for all types of forecasting. Changes in the age groups of the population using health services are a basic component in projecting the demand for services and personnel. By assuming a fixed ratio between health professionals in different services and population in actual age groups may, it is possible to construct a relevant first order indicator of future demands. An increase in population will also affect the supply side of health personnel. This approach can easily be implemented based on population projections which are known with a relatively high degree of certainty for the first decades. However, this approach is not sufficient to forecast future population needs because it does not take into account other factors. In the most recent population projection (2011) made by Statistics Norway, the population is projected by age and sex at the national level up to and including the year 2100.

◀ 2) Current utilisation patterns

Most models also consider the effects of changes in population structure to estimate the future demand for health services. This exercise requires data on present health care utilisation rates by age and sex, in different settings. These patterns are translated into health workforce requirements by using existing data on population size. It is assumed that the utilisation rates and the related health workforce requirements remain constant over the course of the projection period. In baseline scenarios, changes in demand are driven by changes in population size and structure only. This approach is useful if the change in utilisation pattern cannot be projected properly (see approach 3). However, it is easier for countries with fully developed health care systems to use the existing utilisation rates than countries without access to the same data and where the living conditions are expected to improve. This should be taken into account in developing a forecasting model.

The HELSEMOD model uses data from multiple sources in the Statistics Norway`s health statistics to disclose the current utilisation patterns. Available data varies across the different health care settings, and health care utilisation data is not seamless between hospital and primary health care in Norway. If data is not available, it is assumed the same pattern for every population group. The lack of good data for all groups could be considered a weakness in the model. The demographical component is shown as a time series for each year in the projection period, which is beneficial when building a forecasting model.

### ◀ 3) Changing utilisation patterns (e.g. need-based)

In addition to merely considering the population size and current utilisation patterns, it is also possible to incorporate possible changes in the demand by using different methods. The two most common approaches are: the utilisation-based approach and the needs-based approach. However, there may be gaps between utilisation and needs for health services. For both approaches, the most common factor is changes in population health status (morbidity or epidemiology). This can be taken into consideration by using data on past trends in health risk factors and the incidence/prevalence of a number of diseases by age and sex, making assumptions that these trends will either continue or stabilize in future years. The use of available data is often complemented by expert consultations to seek views on the most probable scenarios in terms of morbidity in the years ahead. “Needs-based” models try to assess any current gap between utilisation rates and health care needs by using information about unmet care needs as reported for instance in population-based surveys and/or by using available evidence on gaps between current use and recommended use according to existing clinical guidelines.

One should consider the quality of available data before making such projections, as this approach requires a large amount of information from administrative sources, disease registries and/or population-based surveys. Certain models make assumptions about compressions or expansions of morbidity or mortality, and build their projections on health workforce requirements based on arbitrary assumptions. Such practices should be avoided.

Epidemiological trends and expert judgments can also estimate changes in the prevalence of e.g. circulatory diseases, cancer, diabetes, lung diseases, mental diseases, people with dementia, alcohol abuse and other conditions that may increase the demand for health services. Even though such judgments may not produce specific numbers by

themselves, they are an important supplement/alternative to available data.

A model may consider past trends in the health care and social services when making projections. The HELSEMOD model only indirectly include such aspects through the assumption the 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.

#### ◀ 4) Changes in Health Service Delivery

Changes in the composition of health services may also impact the future demand for different categories of health professionals. One can expect a re-organisation of the health care service deliveries to influence the health workforce requirements, requiring a different number and mix of health care providers. Many countries try to re-orient activities away from hospitals for example by strengthening primary health care, home-based care and long-term care in institutions. These policies are likely to have an impact on the health personnel demand. Some countries have tried to include this in their health workforce planning models. For this purpose, the model requires possible assumptions about the future direction and magnitude of the reforms. Some Norwegian reforms are incorporated in the HELSEMOD 2012 model and in earlier versions. An example is 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. This is one way to take into consideration that the health care delivery system affects the health workforce demand. 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. Such reforms can influence future demand considerably. Although the effect of different re-organisations can be hard to measure, it is an important factor to incorporate into any forecasting model.

#### ◀ 5) Gross Domestic Product (GDP)/Health Expenditure Growth



Future economic growth in the society, whether negative or positive, is likely to be very important for the future demand for health services and health professionals. Positive economic growth increases the public and private resources to pay for health services. Only a few models have tried to incorporate economic growth. Experiences show that countries with affluent economies tend to increase the share of GDP spent in the health care sector. Countries with reduced public spending and high unemployment rates tend to protect the health sector, although expansion of patient co-payment is often introduced. The HELSEMOD model assumes that positive economic growth will create higher expectations and utilisation of services beyond the impact of demographic changes. The model includes this aspect through GDP growth.

### Results:

Since most of the Norwegian health spending is publicly (more than 80 %), the model recognises the increasing health and social spending depending on political decisions. Models in countries with different health systems will also benefit from incorporating economic growth.

The political re-organisation of health care deliveries is influencing the demand but it is still early to say if the assumptions made to measure it are good.

### Helpful tips:

- *The forecasting model would benefit from including projections not only at the national level, but also at a regional level. If possible, this should be a part of future model. The model would improve if it could incorporate to forecast changing utilization rates directly. This could be hard to measure but is a good indicator of the future need*
- *Based on the OECD experiences, and following the Norwegian model, for an easy implementation of the Norwegian model:*
  - *Population size projection should be incorporated, although interpreted with care;*
  - *Considering the current utilisation rates is a good basis for the model, but is insufficient for forecasting future needs;*
  - *Being able to forecast changing utilisation rates will greatly improve the accuracy of the model;*
  - *The effects of significant health reforms or political priorities should be quantified and incorporated into the model;*

- *National economic development and health expenditure growth should be incorporated and is essential for a good forecasting model.*

### Further information:

Ono, T., G. Lafortune and M. Schoenstein (2013), “Health Workforce Planning in OECD Countries: A Review of 26 Projection Models from 18 Countries”, OECD Health Working Papers, No. 62, OECD Publishing. <http://dx.doi.org/10.1787/5k44t787zcwb-en>

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, [http://www.ssb.no/emner/06/01/rapp\\_helse/rapp\\_201214/rapp\\_201214.pdf](http://www.ssb.no/emner/06/01/rapp_helse/rapp_201214/rapp_201214.pdf)

World Health Organization (2014), Health systems in times of global economic crisis: an update of the situation in the WHO.

