Forecasting

Is there a basic approach to estimate "the right people"?

Although the seven planning systems share planning principles and in most cases also the basic dimensions of planning (quantity and timing) the models and process to forecast those quantity in the future are varied. **At its basic stage, HWF planning consists in forecasting the evolution in the supply of and in the demand for healthcare services taking into account demographic variables.** Healthcare workforce forecast models function by projecting supply, demand, or both. To determine the evolution of supply, the initial stock of physicians, nurses, or any other health care professional is considered. The current health workforce is then updated according to the evolution of the factors known to affect it, like changes in the mortality and retirement rates, migration flows, medical school intakes, etc. Forecasting demand is arguably more complex, mostly due to a higher uncertainty over the estimate of the underlying parameters. Common economic factors like the evolution of demography, income or the GDP growth rate influence the demand for healthcare services.

A multi-professional approach to health workforce planning, taking into account the interaction between professions (vertical and horizontal substitutions) is also to be considered as essential for a reliable forecast.

What's "the right time"?

To set "the right time" it's necessary to take into account not only the training period (from 4 to 12 years) but, in case government wants to implement new policies, there is also a lead time due to all the legislative hurdles that have to be passed before any change can be started. A period of 6 to 7 years is considered realistic for any policy to be implemented, so it is considered realistic to use 5 and 12 additional years for changes to be accomplished. The total time frame is **therefore usually 12 to 18 years** from the present time. Therefore, any Country commencing with health workforce planning has to dampen the expectations on the short term, e.g. the first 6 to 10 years.

Is it feasible to forecast other HWF dimensions?

More comprehensive forecasting models consider also the skills of the workforce, their geographical distribution, the impact of technological progress, the epidemiological needs of the population or the kind of services provided and how all these factors

evolve and their interactions within the system. System dynamic approach are very useful to forecast many dimensions interacting in a complex system.

Whatever dimensions are considered, the underpinnings of sound HWF planning is a credible and reliable forecast.

How to have a credible and reliable forecast?

Every forcasting has to be matched with the related margin of error.

It is important that the basic assumptions on which the forecasting models are based can be easily reviewed and changed and that the models are, in general, flexible, in order to be updated in particular the effects of significant health reforms or political priorities should be quantified and incorporated into the model.

It is also important that the models provide for the possibility of starting from a current imbalance between supply and demand. In the first years of modeling focus on developing a supply forecast combined with simplistic scenarios for the demand side:

- *for the supply forecast it is important that the models can formulate different scenarios related to different conditions of the supply;*

- *for the demand forecasts, in addition to aspects of the population, it could be important that the models take into account the budget constraints; also it is feasible to develop a qualitative method for involving stakeholders in the description of future demand.*

Minimum planning requirements

- *Forecast both supply and demand, first of all measuring and predicting the demographic variables;*

- *Involve stakeholders in the description of future demand;*

- *Provide different scenarios related to different conditions of the supply;*

- *Calculate the margin of error of the forecasting;*

- *Take into account the interaction between different health professions and the budget constraints;*

- *Set at 12 (for nurses) or 18 (for medical doctors) years the minimum time horizon and restrain expectations on shorter terms.*

Other recommendations for a better planning process

- *Focus the forecast on long-term structural factors and avoid being overly sensitive to cyclical fluctuations;*

- *Forecast the trend of dependence of the health care system on foreign trained HWF personnel;*

> *Be able to forecast changing utilization rates because considering the current utilization rates is a good basis but is insufficient for forecasting future needs;*
>
> *Include parameters to address the issue of inequitable geographic distribution of the HWF;*
>
> *In order to ensure that the dependency is addressed and more workforce needs are identified".*

Data

How to look at the dimension "quantity"?

The **quantity** could be expressed in working **full time equivalents** or in headcount. The expression in full time equivalent is important because in most countries there appears to be a gender difference in average working FTE between males and females that changes very slow. Females tend to work less FTE on average than man. In combination with an expected feminisation of the health workforce this will augment the number of students required to enter education programmes. It's also important to distinguish the "**professionally active**" workforce and the "licensed to practice" workforce.

To have **updated data** on the quantity of health professionals currently active is also a necessary condition to have a reliable forecasting.

How to collect data?

It's common to use different sources for data collection, also because mainly the data useful for the forecasting exercise are usually not collected with planning purposes. In the first stages it recommended to start with the "most" easily available data and only in the next stages working on both improving the data quality and increasing the data quantity (inclusion of additional parameters / sources) on a continuous basis. At that point it could be necessary to design and implement standardized and automated approaches for data collection, analysis and reporting (templates, macros, statistical programming codes). Probably, in the beginning, there are only **aggregate data** available that is anyway sufficient to start the planning process. Then, it's necessary to improve data collection investing in a individual database. To build such robust data collection it's important to acquire political support in order to establish a legal framework (e.g. data access rights).

If the forecasting model requires data not available from any sources use **qualitative methodology to gather the information** needed (surveys, Delphi, estimations).