WP6 Deliverable D.061

Joint Action Health Workforce Planning and Forecasting

User guidelines on qualitative methods in health workforce planning and forecasting

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Key messages

- Health workforce planning and forecasting is complex due to the large number of potential factors influencing the supply and demand of health workforces. There is also a degree of intrinsic uncertainty associated with considering the future.

- In addition, workforce planning and forecasting is particularly important for the health workforce due to its specific training pipelines and distinct professions, the relationship between the health workforce and the health of national populations, as well as the investment that MSs make in health professionals' education.

- Whatever the stage of health workforce planning and forecasting – whether implementing a health workforce planning and forecasting process for the first time, or looking for methods to enhance existing processes – these user guidelines provide examples of methods and tools used by Work Package 6 Joint Action partners and Member States which can be harnessed to helpfully process some of the inherent complexity and uncertainty surrounding workforce planning and forecasting.

- The qualitative methods presented within these user guidelines can be used for a number of purposes alongside quantitative methods to ensure that an integrated approach to health workforce planning and forecasting is achieved by Member States. It is encouraged and recommended that these qualitative methods are adapted and deployed as part of robust national processes that Member States use to arrive at informed and transparent decisions regarding the health workforce.

- It is also recommended that MSs examine and take into account how various partners have reviewed workforces thus far and the methods they have used. This existing body of evidence provides good opportunities for learning when MSs consider and plan similar workforce groups for their own national contexts. It is encouraged that international, national and local dialogue occurs more frequently in the future with support of those partners who have made workforce planning advances, have useful evidence and approaches that may assist. The Joint Action pilot studies will also provide information on potential adaptations for MSs evaluating the applicability of methods to their specific national contexts.

- These qualitative methods can be used to describe current workforce situations and can also be used to systematically investigate different workforce futures. These methods include ways of gathering information on factors likely to affect future health workforces, ways of defining plausible futures and quantifying those futures or uncertain parameters for model-based planning.

- Ultimately these methods are used to inform real world decisions in the field of workforce planning and forecasting for national specific contexts such as, but not limited to, *numerus clausus*. As a result it is a prerequisite that stakeholders and experts are identified and engaged effectively as part of workforce planning and forecasting to enhance the collective intelligence used to arrive at robust decisions using such methods.

- The central idea and assertion of these user guidelines is that use of such methods improves the relevance of outputs, aids transparency of decision-making and helps to develop a shared vision of the future health workforce for Member States and across Europe.

Executive summary

These user guidelines are aimed broadly at health workforce planners and forecasters in Member States (MSs) and stakeholder organisations in the European Union who would like to apply qualitative methods to improve their health workforce planning and forecasting in their specific national contexts.

Whilst health workforce planning and forecasting in the European Union has been found to be highly 'context dependent' (Kuhlmann *et* al, 2012) and determined by its perceived purpose and degree of institutionalisation in individual MSs (European Commission, 2012), there are similarities in the qualitative methods used by Member States to undertake workforce planning and forecasting.

This document describes the qualitative methods used by partners in Work Package 6 (WP6) in the Joint Action on Health Workforce Planning and Forecasting. Qualitative methods are those which are used to gather and process information on the key factors which are likely to affect the supply and demand of health workforces (through techniques such as interviews) and includes methods to describe and quantify potential futures.

These methods were identified from survey responses from WP6 partners and these guidelines contain information on the operational use of individual methods (section 3) and also descriptions of the contexts in which they are used; individual descriptions of health workforce planning and forecasting for seven WP6 partners (Belgium, Finland, Germany, Hungary, Netherlands, Spain and the United Kingdom) are presented in Annex 3.

The identified qualitative methods are presented with examples and tools where available to make their accessibility and ease of use as straightforward as possible. Section 3 describes the use and rationale for conducting:
- stakeholder identification and analysis
- literature reviews
- interviews
- surveys
- scenarios
- Delphi exercises

It is assumed that there is a sequential relationship between these methods and the use of model-based planning with greater resource implications and use of model-based planning as scenarios and delphi exercises are used.

Whatever the stage of workforce planning and forecasting in specific national contexts, it is recommended that robust qualitative methods are used to enhance the knowledge and expertise used in health workforce planning and forecasting processes to improve the ways in which decisions on these workforces are reached.

1. Introduction

These user guidelines are aimed broadly at health workforce planners and forecasters in Member States (MSs) and stakeholder organisations in the European Union who would like to apply qualitative methods to improve their health workforce planning and forecasting in their specific national contexts.

Health workforce planning and forecasting is dependent on reliable *quantitative* and *qualitative* data and methods. Quantitative projection methods and reliable data on, for example, the number and distribution of health care professionals in a health system must be supplemented by appropriate *qualitative* methods and data as they can facilitate an in-depth understanding of health workforces and the complex relations surrounding their supply and demand.

In addition, workforce planning and forecasting is particularly important for the health workforce due to the specific training pipelines and distinct professions in the health workforce, the relationship between the health workforce and the health of national populations, as well as the investment that MSs make in health professionals' education.

This document identifies and classifies the various qualitative methods that can be used to supplement health workforce planning and forecasting. It primarily focuses on MSs involved as partners in WP6 (Horizon Scanning) in the Joint Action on Health Workforce Planning and Forecasting. Taking the qualitative methods used by these partners (such as interviews, scenario generation and Delphi exercises), these guidelines aim to assist MSs in the selection of appropriate methods for their national contexts.

To support the general objective of the Joint Action – as a platform for collaboration and exchange between partners to prepare for the future of the health workforce – this document selects a number of qualitative methods which are described in more detail (section 3). Practical tools and examples of their use are provided so that these qualitative methods can be easily understood and, where appropriate, adapted to enhance MS-specific health workforce planning processes.

Regardless of the stage of development of workforce planning and forecasting in national contexts, the use of qualitative methods is strongly recommended. Qualitative methods may be used, for example; to more fully understand the future direction of a health workforce, to optimise the engagement of different forms of expertise from stakeholders or to sense-check findings. The importance of effectively involving stakeholders early and often in workforce planning and forecasting is well made by Dussault *et al* (2010):

> 'Even with the best data and projections at hand, governments cannot dictate or decree change. It still has to be somehow negotiated, hence the importance of engaging the various stakeholders as early as possible in the process. Stakeholder involvement to build on existing workforce planning expertise and to nurture the process of health workforce planning is probably the most vital part in the process, as there is a need for a common agenda and language and *a priori* consensus about methods and conceptualisation for workforce planning.'
> (Dussault *et* al, 2010).

1.1 Quick start table for selecting a qualitative method

This section provides a quick start option for those readers with a specific question or desire to select a qualitative method that they can jump to now using the table below to learn more.

However, we strongly suggest the reader works through the document in sequence as the background, target audience and aims of this guidance are important to understand.

Also of note and preceding the methods, there is clarity provided within section 3 which we consider important, namely:

- An overview of qualitative methods in health workforce planning and forecasting.
- More about WP6 (Horizon Scanning) and our work.
- Definition and explanation of the application of horizon scanning for this Joint Action. This includes descriptions of the stages that will be followed as the work progresses.

Quick start table: Selecting the right method for you

Choose what you would like to do	Method section
Identify people to be involved in your project.	3.1 Identifying stakeholders and experts
Understand what information already exists on a workforce topic.	3.2 Literature review
Interview stakeholders and experts to obtain a deeper understanding of a workforce topic.	3.3 Interviews
Collect qualitative or quantitative information from a defined group.	3.4 Surveys
Investigate plausible futures.	3.5 Scenarios
Quantify scenarios or uncertain variables.	3.6 Delphi exercises

2. Background

Health workforce planning and forecasting

Effective workforce planning has been described as ensuring 'the right people, with the right skills, in the right places, at the right time' (Taylor, 2005).

Over time there have been strategic additions to this description (Hornby and Santric Milicevic, 2011) resulting in definitions of workforce planning that contain further dimensions. As what is required of health workforces is multifaceted, what is included as being the 'right' workforce can extend to include a workforce that has the 'right values and behaviours' (Health Education England, 2014) or is 'doing the right work effectively and efficiently, at the right cost, with the right productivity' (Dussault *et al*, 2010). There is also a definition of workforce planning that relates to forecasting the required health workforce to meet future health service requirements and the development of strategies to meet those requirements (Roberfroid *et* al, 2009; Stordeur and Léonard, 2010).

Although there is agreement on the correct objective of a workforce planning process (such as right people, right places, right skills, right time), the processes and models which are used internationally in different states and health systems are varied. For example, the models which are used vary from those which consider demographic variables only, to those that consider more 'elaborate' supply and demand variables (OECD, 2013).

Health workforce planning and forecasting in the European Union

Planning models in the European Union (EU) have been found to be 'highly context-dependent with regard to their fit with the institutions and policy approaches of the healthcare system, the educational and occupational systems and the availability of reliable and complete data' (Kuhlmann *et al*, 2012).

The Feasibility Study (European Commission, 2012) links this diversity in workforce planning across the EU to the relationship between the perceived purpose of workforce planning in each country and the extent to which it is institutionalised. The 'national specific drivers' in each case mean that there is no agreement on what constitutes a 'good system'. The study argues that each system should be judged against its initial purpose and it identified a broad classification of three possible purposes of workforce planning:

a) **Monitoring**: data on the current and future health workforce are collected to monitor performance and make forecasts (e.g. of expenditure)
b) **Analysis** to respond to challenges in terms of balancing demand for and supply of human resources for health, within the current environment
c) **Strategic planning** of the longer term direction of the health system, including resource allocation, system characteristics and ensuring a sustainable health workforce.

Source: The Feasibility Study (European Commission, 2012)

Figure 1: 'Determinants of health workforce planning systems' (European Commission, 2012, p115)
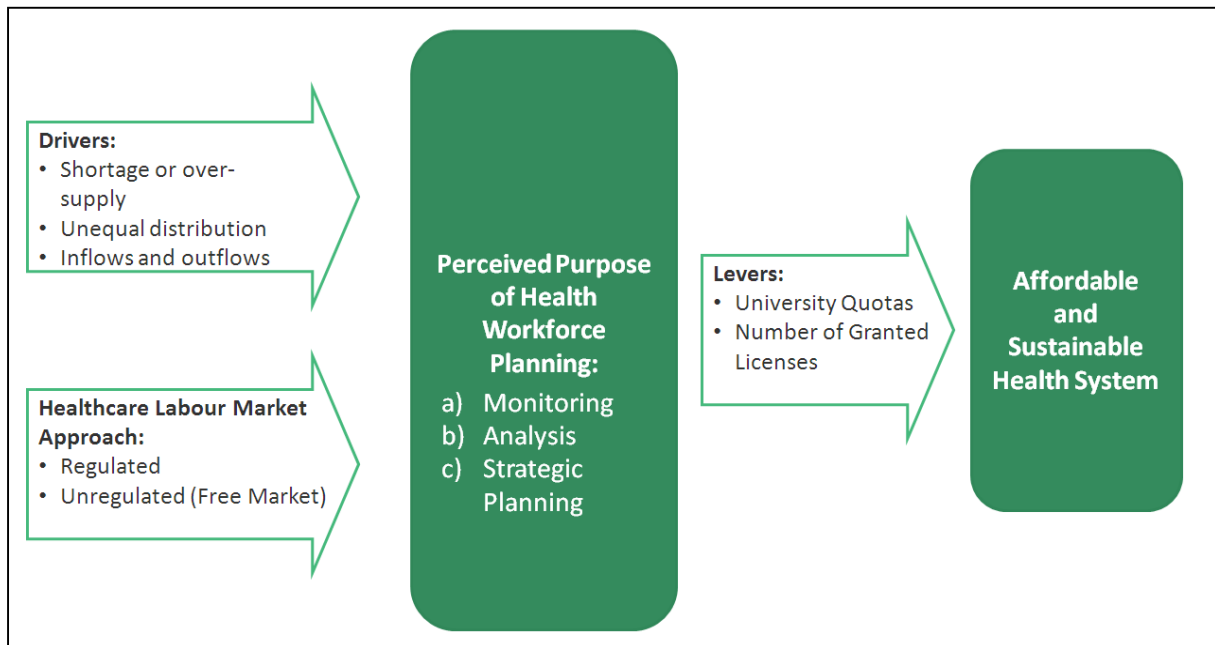

In terms of diversity in forecasting approaches, the OECD's review of projection models (including those used by eight partners in the HWF Joint Action) distinguishes between the supply and demand sides of these models. It notes that the majority of supply models are based on a stock-flow approach which take into account 'replacement needs' only by making 'convenient assumptions' – such as that all health workers retire at a given age – but that some models take wider factors into account (such as retention rates and changes to retirement patterns).

On the demand side, the OECD's review categorises the projection models by five approaches: population size only, current health care utilisation patterns; population health needs; possible health service reforms and finally, on projected growth in gross domestic product and health spending. The supply and demand factors and approaches are shown in figure 2.

The OECD report acknowledges that health workforce planning is not an exact science and that projections are based on assumptions which require regular reassessment in a changing environment. Also of relevance is the recommendation that we 'need to first know where we are before we can know where we're heading' in that all projections need good data on the current situation and that workforce planning helps to strengthen this important first step (OECD, 2013 p11). Often, in working towards a quantitative description of the current situation there is a sequential need to first describe and understand what is currently happening in qualitative terms.

Figure 2: General framework to assess the future supply and demand of health workers (OECD, 2013: p21).
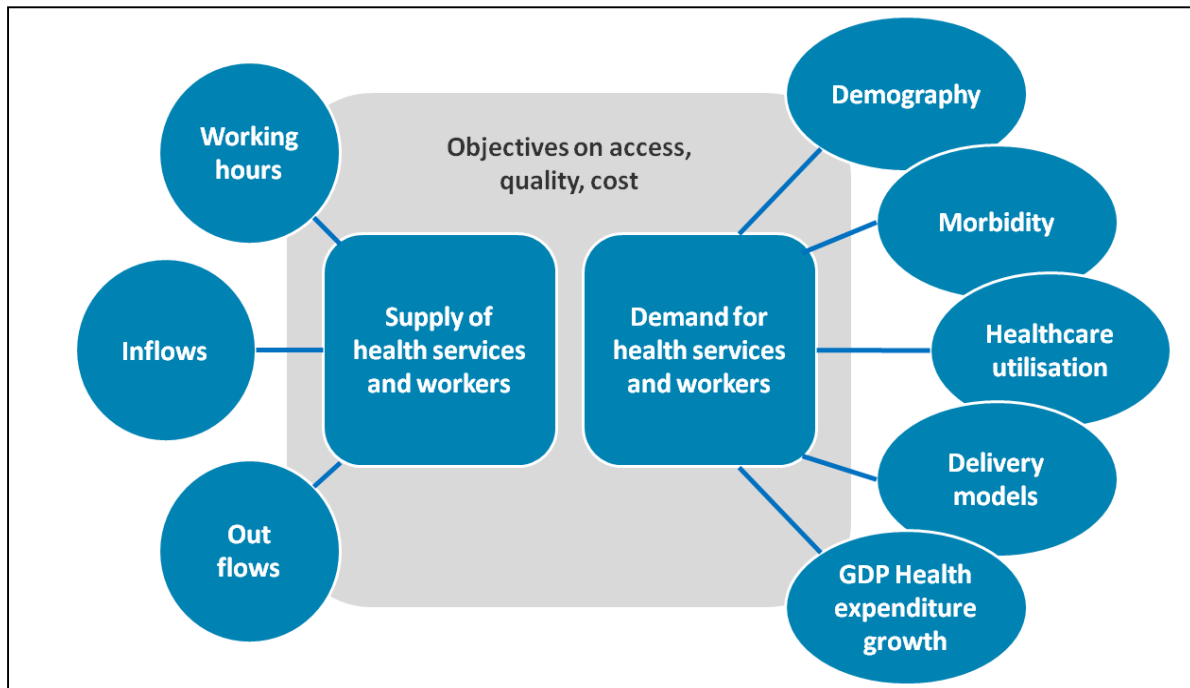
Target audience

Having described some of the diversity in both the aims of workforce planning and the projection models in use, this allows us to consider who these user guidelines are aimed at.

As noted above, there is diversity within the EU on the types of health workforce planning process and therefore also diversity in the forecasting models which are used. We also know that, in 2012, only 13 countries within the EU conducted model-based planning (European Commission, 2012). With this diversity in mind these guidelines are aimed broadly at MS and EU stakeholders working in national contexts at different stages of development of health workforce planning and forecasting (i.e. whether model-based planning is in use or not) who would like to understand the benefits of using qualitative methods in health workforce planning and forecasting and, where appropriate, apply them to their national contexts.

They are written with the aim of being applicable regardless of the stage of development of planning and forecasting. Indeed, there is a relationship proposed between planning and forecasting, in that forecasting requires reliable data which may not exist until developments are made in the planning process to trigger improvements in data reliability (OECD, 2013). This is likely, in practice, to be a highly iterative process as workforce planning and forecasting develops and does not necessarily have an end-point, depending on the purpose of health workforce planning and forecasting in the national context.

Aims of the user guidelines

Image: Thinkstock

In terms of developments in planning, these guidelines describe the qualitative methods which can be used to improve the planning process and offer methods which can be selected as required.

The application of qualitative methods is strongly advocated and their use in planning processes should be refined and developed.

Workforce planning and forecasting is complex due to the intrinsic uncertainty and complexity of factors influencing workforce supply and demand and it is an assumption of these guidelines that the methods used should be updated in response to improvements in (at least) the sophistication of projection models, improvements in understanding of the dynamic processes involved in health workforce planning and better relating outputs of planning processes and forecasting models to strategic decisions regarding health workforces.

The aims of these user guidelines are supplemented and supported by the deliverables of other work packages in the Joint Action, in particular from the core work packages 4 and 5, with their related forthcoming deliverables D043 'Report on HWF planning data' and D052 'Handbook on planning methodologies'.

3. Overview of qualitative methods in health workforce planning & forecasting

Work package 6 (Horizon scanning)
Horizon scanning is defined as 'a systematic examination of information to identify potential threats, risks, emerging issues and opportunities' (House of Commons, 2014). Horizon scanning in the Joint Action on Health Workforce Planning and Forecasting was commissioned as changes in health system design, delivery and demographics are likely to have a significant impact on the future health workforce that is required. WP6 will deliver a report on future skills and competences which employs a systematic examination to arrive at a series of papers communicating this European-level horizon scanning as they relate to trends and professional health workforces (EU Joint Action HWF, forthcoming).

Application of horizon scanning for this Joint Action
Horizon scanning, if deployed systematically, enables the identification and analysis of factors and their interrelationships. In order to successfully do this, WP6 has adopted a multi-stage approach to horizon scanning, supported by defintions of key terms. We set out out these definitions and stages below:

> **Key Factors** are the factors that are most significant to the behaviour of the health and social care system.
>
> **Trends** are historical changes over time to indicators. Indicators can be related to particular factors.
>
> Centre for Workforce Intelligence, 2014a

Stage 1: Engagement with subject matter experts

Experts with a range of backgrounds and subject matter knowledge are identified and invited to take part in a horizon scanning exercise. This typically involves a one–to–one interview with a WP6 team member or a partner who has volunteered to conduct the interview following horizon scanning training. Sessions are designed to extract as many participants ideas from which factors may be identified that may be important or the most significant (key factors) to the future of the health system, regardless of how maverick or unconventional they seem.

The key factors identified in these horizon scanning sessions often have an associated direction of change, potentially becoming a trend via a historical change, and are clearly linked to other factors within the system. Factors may be anything related to the health and social care system that is able to affect, or is affected by, other components of the system.

Stage 2: Establishment of factor themes

It can often be possible to identify factor themes that encompass a set of related factors. However this aggregation must not lose the usefulness and meaning of the factors identified. Aggregating factors in this way enables analysts to reduce the number of factors being considered within the system so that their linkages may be effectively mapped. One example of this would be the inclusion of drivers such as age profile, and migration, birth and death rates in the population factor theme, as illustrated in stage two of Figure 3.

In these factor themes, individual key factors that have a large influence on the system may be identified and may warrant further investigation as to possible policy interventions.

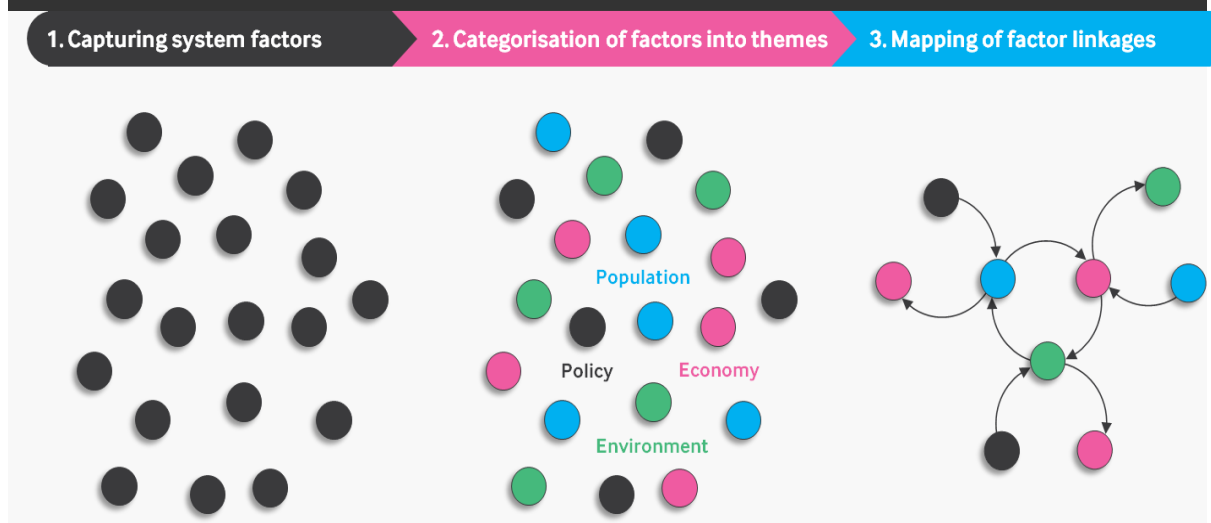**Stage 3: Mapping influential system factors**

The information captured from the horizon scanning exercises carried out with subject matter experts allows clear linkages to be drawn between individual factors. These factors and linkages may then be mapped in a causal loop diagram (see stage three, Figure 3) to simplify the complex system that emerges.

This stage in the horizon scanning phase provides analysts with a high-level view that can inform decisions that might be effective in stimulating change upon systemic factors. Despite this, further analysis is required in order to deduce:

- whether policy interventions will have a positive or negative effect on outcomes
- to what scale changes will occur and
- how long it will take for the change to occur.

Figure 3: System factor identification in the horizon scanning phase (CfWI, 2014a)

The horizon scanning process enables the capture, categorisation and linkage of influential systemic factors and components from subject matter experts.

| 1. Capturing system factors | 2. Categorisation of factors into themes | 3. Mapping of factor linkages |

Population

Policy   Economy

Environment

Qualitative methods

These user guidelines investigate the qualitative methods which are in use in health workforce planning and forecasting in the EU to identify potential threats, risks, emerging issues and opportunities as they relate to the supply and demand of health workforces. An analysis of the Feasibility Study for the Joint Action (European Commission, 2012) and a survey of WP6 partners revealed that different MS incorporate forward looking activities into health workforce planning and forecasting in different ways and that there was not a shared definition of horizon scanning across the MSs.

Rather, an analysis of the survey responses (presented in annex 3) revealed a range of qualitative methods that are in use to carry out the analytical activity of looking beyond the present and considering how certain factors or changes may influence the supply and demand of health workforces. A grouping of these methods into their overall categories of qualitative information collection is shown below to demonstrate the types of activities which occur. The methods highlighted in bold are those that are developed in more detail in section 4 and were selected based on the material that WP6 partners provided to describe that particular method to a sufficient extent to be included in the user guidelines.

To share the information on the range of qualitative methods used – and encourage people in specific national contexts to select the methods most appropriate for them – we have reproduced the responses from partners in Annex 5 and listed the WP6 partners in Annex 2.

Table 1: Grouping of methods into overall categories of collection

Qualitative information collected by	Method and example(s) of how they are used
Desk research	**Literature reviews** to identify trends, factors and policies which may affect workforces; and to identify experts.
Interviewing experts and stakeholders individually	**Identifying experts and stakeholders** as part of a statutory or organisational group, or by methods such as chain referral sampling. Semi-structured **interviews** of stakeholders and experts to identify trends, factors and policies which may affect workforces. Individual meetings to provide workforce intelligence.
Group meetings of experts and stakeholders	Structured meetings to generate **scenarios.** Structured online involvement (such as a **Delphi exercise** or electronic group decision rooms) to reach consensus on numerical values for inclusion in a forecasting model. Group meetings to reach consensus on numerical values for inclusion in a forecasting model; to provide workforce intelligence and focus groups to discuss research developments.
Observation of practice	Field trips to observe the practice of the workforce (for example in clinical settings) to enhance the workforce planners' understanding.

Sections 3.1 to 3.6 gives more information on conducting literature reviews, surveys, interviews, scenarios and Delphi exercises. They are listed in a general order of increasing resource inputs that are required to carry them out. However, this is not an absolute hierarchy, because it may depend on, for example, the scale of stakeholder and expert involvement.

To add a further dimension, whilst literature reviews, surveys and interviews can be used to horizon scan in purely qualitative terms, the use of scenarios and Delphi exercises are commonly used in combination with a quantitative model and therefore have greater resource requirements and are generally more complex to use.

Figure 4: Qualitative methods, resources and model-based planning (CfWI, 2014)
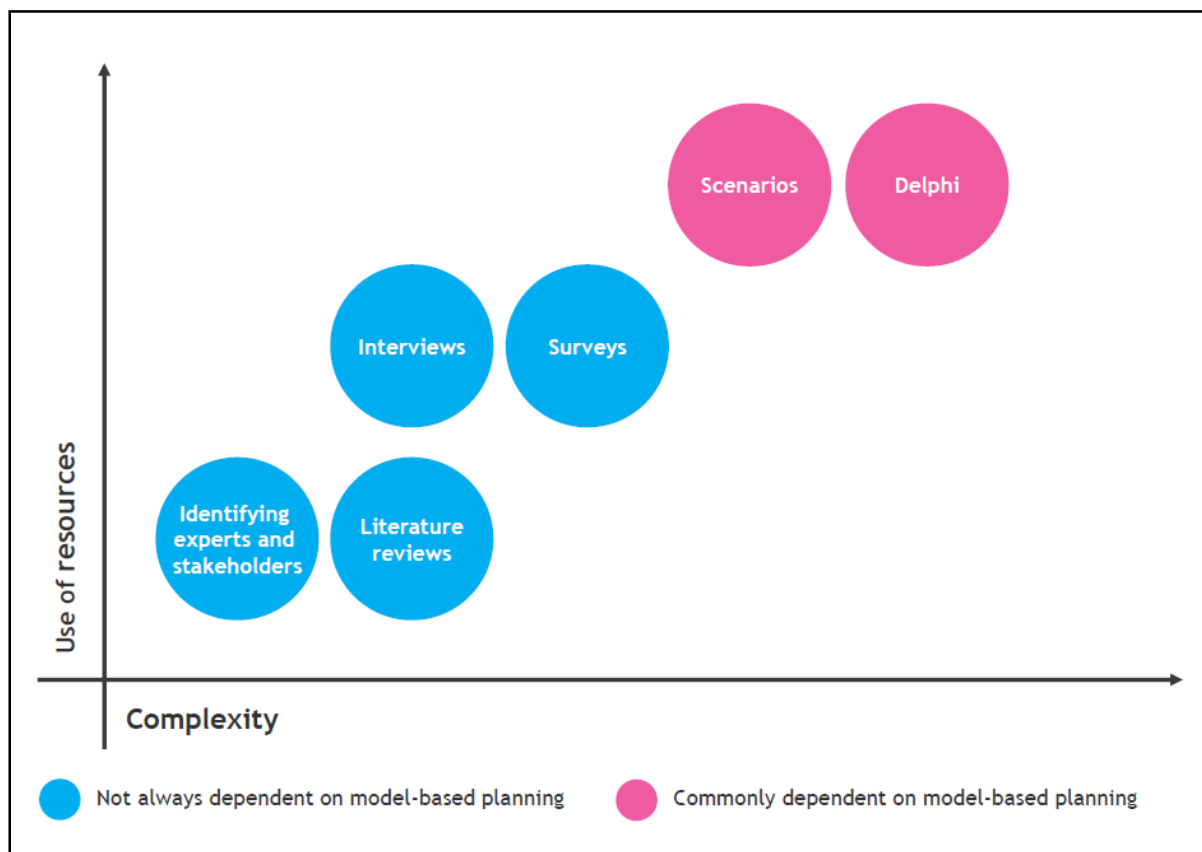
3.1   Identifying experts and stakeholders

Effective involvement of stakeholders and experts is essential to health workforce planning and forecasting. Due to the complexity and uncertainty inherent in workforce planning and forecasting a sensible response is to ensure that all of the relevant people are identified and brought into the health workforce planning process, with the central idea that this improves the relevance of outputs, aids in transparency of decision-making and helps to develop a shared vision of the health workforce.

For clarity of definitions, the predominant and longstanding business management definition of stakeholders is of 'any identifiable group or individual who can affect the achievement of an organisation's objectives or who is affected by the achievement of an organisation's objectives' (Freeman and Reed, 1983).

An expert is defined broadly as any person 'with comprehensive or authoritative knowledge in a particular area' and through carefully defining the expertise needed on a project informed choices can be made on whether single experts or combinations of expertise (for example in Delphi exercises – see section 3.6) are most appropriate (Caley *et al*, 2014).

However, the decision about how to define stakeholders and experts for each workforce planning and forecasting project is important as it affects who is taken into account in complex areas of public policy where many individuals, groups and organisations are involved (Bryson, 2003).

In considering health workforce planning and forecasting for different national contexts, this specific definitional question should be taken into account for each workforce project. Once defined, stakeholders can be identified and mapped using a variety of techniques (see, for example, Bryson, 2003 which describes the power and influence grid as shown below).

Figure 5: Power and interest grid (Bryson, 2003)
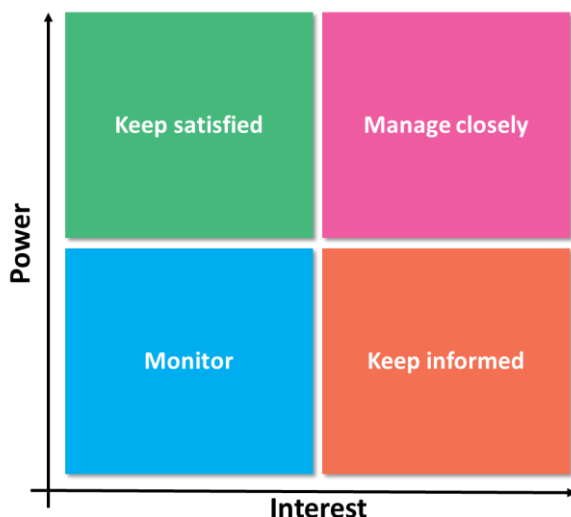
In this section we reference templates on power versus impact analysis and an engagement plan (section 3.1.2).

3.1.1 Subject matter experts

Outside of country situations where the composition of expert groups is determined statutorily there is a need to identify and consult subject matter experts.

As health workforce planning and forecasting faces limits on the availability of empirical data on future supply and demand factors, experts are often used to provide judgements on values that input into models. Another way in which subject matter experts are important is in helping to identify stakeholders. This is achieved by non-probability sampling methods, some of which are described below.

> **Non-probability sampling**
>
> 'A sampling procedure in which the sample is chosen on the basis of convenience [or] personal judgment.'
>
> **Judgmental sampling**
>
> 'A form of non-probability sampling in which a researcher selects a sample from a population on the basis of judgement'
>
> (Law, 2009).

At the outset of a research project, non-probability sampling may begin with judgmental sampling where people are selected as experts on the opinion of the researcher (Deming, 1990), or a subject matter expert known to the researcher, i.e. the initial sample is based on judgement or decided by the purpose of the research. Once this initial stage is complete, sampling by referral from subject matter experts to identify other experts and stakeholders can be appropriate, as below.

3.1.2 Stakeholder analysis and engagement

An effective way of obtaining a list of stakeholders is to assemble a group of subject matter specialists and ask them to compile a list of all of the people and organisations that should be consulted or who are potentially affected by a workforce planning project (NHS Institute, 2008).

Once stakeholders are identified, there are a range of tools to analyse and then plan for their engagement in the project. A common way to analyse stakeholders is through mapping their relative power and interest in the project, through four or nine sector tables (see, for example, NHS Institute, 2008). Once the stakeholders are analysed this categorisation determines the level of engagement you may seek from different individuals or groups. This can be planned using templates (see, for example, Australian Government, 2011).

3.1.3 Examples of where this method is used

Country and organisation	Source
Netherlands, Capaciteitsorgaan	www.capaciteitsorgaan.nl
United Kingdom, Centre for Workforce Intelligence	www.cfwi.org.uk

3.2 Literature reviews

Literature reviews can be used to identify evidence that may affect the supply and demand of health workforces, to identify experts and stakeholders for further involvement in workforce planning projects and as a systematic way to appraise available research evidence. This section takes the general and relevant points from the CfWI's *Literature review guidelines* (CfWI, 2014b) technical paper to demonstrate the common features of a workforce planning literature review.

3.2.1 Aims of a literature review

The literature review's main purpose is to consider the evidence that is available, and examine previous research and thinking on a topic. Ideally, a literature review should identify areas where research is lacking, or where additional research would add value. The literature review aims to ensure that:
- all available evidence has been considered prior to research
- that the research conducted meets high standards of quality, validity and credibility
- stakeholders can be confident in and engage with the research that has been conducted.

So that these aims are met, it is good practice to scope the literature review before it is conducted.

3.2.2 Scoping the literature review

The first step in scoping the literature review is to identify the research question. Whilst the focal area of the literature review is established, it is vital that a good understanding of the project area is developed, and that the broader context and implications of the area are understood.

Interviews with stakeholders can help to identify gaps in the literature, and ensure that the literature provides sufficient overview of the project area, especially where:
- limited information or data is available on the given area
- the area in question is particularly small or specialised

3.2.3 Checklist
- Allocate appropriate time to the literature review, potentially around 15 to 20 per cent of the overall project timeframe.
- Allocate sufficient resources to the literature review, including research databases, access to libraries and institutes and discussions with experts in the field on key pieces of literature.
- Ensure there is sufficient time for specialists and experts on the research topic at hand to discuss and review the literature review after it has been outlined and written.

3.2.4 Search strategy
One way to detail the search strategy is to construct a search profile which outlines the search parameters that define the relevant literature. Systematic literature reviews differ from non-systematic reviews in that they have an explicit methodology (including search criteria and screening of studies to include or discard on the basis of stated criteria) so that the review is accountable and open to debate (Alliance for Useful Evidence, 2013).

3.2.5 Structure

A suggested format for workforce planning and forecasting literature reviews is suggested below, it is not a prescriptive or definitive structure, but a starting point to be adapted as appropriate:

- **Executive summary**
- **Introduction to the workforce review:** for example, an outline of the work done and the places of employment; numbers of the profession and the other professions they interact with (an understanding of the diversity of the proessions that they interact with)
- **Demand:** for example, the drivers of workforce change including health-system developments, changes to specific care pathways; technological developments
- **Supply:** for example, further detail on workforce numbers and historical trends in supply, as well as drivers which may affect these numbers
- **Conclusion:** describe how the review will be used in the wider project and the main findings.

Figure 6: Literature review process (CfWI, 2014)
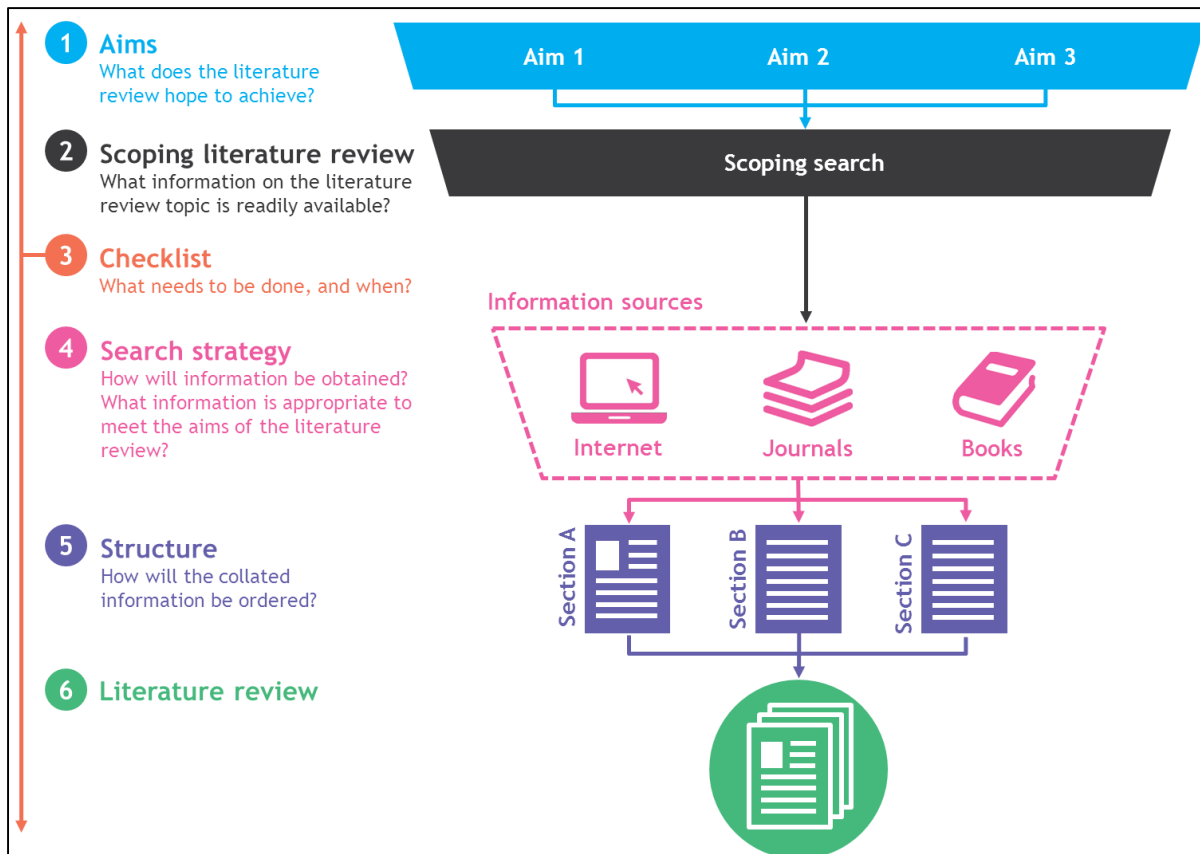
3.2.6 Examples of where this method is used

Country and organisation	Source
Belgium, Belgian Health Care Knowledge Centre	www.kce.fgov.be
Netherlands, Capaciteitsorgaan	www.capaciteitsorgaan.nl
United Kingdom, Centre for Workforce Intelligence	www.cfwi.org.uk

3.3   Interviews

There is a continuum of interview types – from unstructured to structured – and their selection is based on the level of control that the researcher wishes to exert over the interviewees responses (Bernard, 2006). A large proportion of qualitative methods in health workforce planning and forecasting that were highlighted by WP6 respondents focused on the more unstructured interviews and meeting methods to produce inputs into models or provide contextual information about particular workforces.

This section focuses on semi-structured interviews and highlights templates used in the Joint Action using this method.

3.3.1   Focal question

In workforce planning and forecasting the topic of concern (or focal question) depends on the type of review being conducted. Often, it concerns asking people to think up to a certain year (determined by the timescale of the review) about the things that may change the requirements, numbers and deployment of specific professions - for example: 'thinking up to the year 2025, what are the driving forces that may affect the requirements, numbers and deployments of the pharmacist workforce in England'. Through using semi-structured interviews to conduct horizon scanning, it is possible to ask questions which concern complex systems and are also about the future. The future has a high degree of uncertainty and the method provides a step in processing some of this uncertainty and complexity in a systematic way.

3.3.2   Benefit of using semi-structured interviews

Semi-structured interviews are considered to be an effective qualitative research method at the outset of a research project when it is useful to target people based on the specific knowledge and experience that they have (Bernard, 2006). Based on the use of an interview guide, semi-structured interviews allow the interviewer to be in control of what they want from an interview but also leaves them and the respondent free to follow new leads (ibid, 2006). The two-way interaction may also allows the interviewer to encourage participants to think over a longer timescale than usual.

The people that are interviewed may be identified through non-probability sampling methods, such as referral sampling. It may also be beneficial to consider selecting interview participants who have expertise about a related area (such as technology) so that a variety of views are included.

The number of semi-structured interviews to be conducted will vary for each project. As part of project initiation stages it is recommended that this is discussed and agreed. The main cost element is resource time and the overall timescale that can be afforded at the stage of a review. Generally in qualitative research projects the sample size may not be determined in advance, rather it is determined once theoretical saturation is achieved, i.e., the interviews end when in the process no new information is emerging on categories of interest (Liamputtong *et al*, 2006).

In terms of interview skills for semi-structured interviews, the aim is to have a relatively natural conversation where you use certain prompts (as described in the template in section 3.3.4). Recapping

on the information that you have heard to ensure that you have understood it correctly is also a useful skill.

3.3.3   Predictions and complexity

Horizon scanning is not concerned with making predictions or attempting to gather predictions from people. When using semi-structured interviews to conduct horizon scanning, it is necessary to interview a range of people with different experiences of the area of interest and ask them what they think the driving forces are which influence the particular part of the complex system in question.

Health systems are complex because too many factors are interacting to make reliable predictions about what will happen (Gloubermann and Zimmerman, 2002). Whilst horizon scanning is not setting out to make predictions, there is a great deal that can be understood from experts on the key forces which may shape the supply and demand of future health workforces.

3.3.4   Interview template

This section discusses the spreadsheet *WP6 Interview Template* (available on the Joint Action website) and takes each numbered part from the spreadsheet in turn to demonstrate how it is used.

The spreadsheet is designed to be used either as an A3 paper print out so that a written record can be made, or directly typed into as an open spreadsheet. This depends on the preference of the interviewer. The interviews are recommended to be conducted in a face-to-face meeting or by telephone, with the majority of interviews lasting approximately 30 minutes (to a maximum of 1 hour). There are advantages of conducting interviews by telephone (such as less expense) and advantages of conducting them face-to-face (such as building a network of experts for a project, potentially being able to explain the approach more clearly and being able to pick up on non-verbal signs), it is up to the person conducting the research to decide on which approach is the most appropriate for their context.
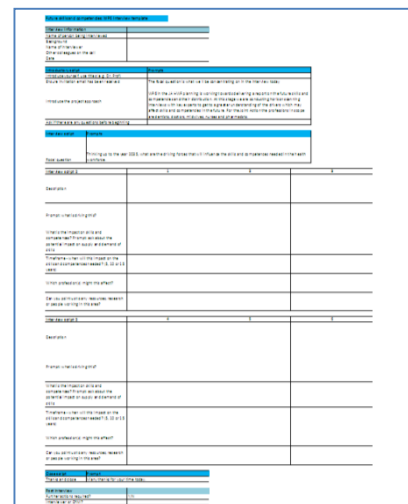
As with all survey instruments, it is always beneficial to pre-test the instrument with a member of the population you are seeking views from (i.e. if you are conducting horizon scanning with pharmacists, pre-test the interview with a pharmacist) and adapt the instrument if any beneficial changes can be made.

3.3.5 Interview information

This is to be completed before the interview and it is necessary to understand the background of the person being interviewed in advance as this leads to an improved understanding of their responses and perspectives.

3.3.6 Introductory script

As described above, we are carrying out research on a topic of concern and so we use the interviews to concentrate on the focal question. This is sent in advance to interviewees by email.

3.3.7 Focal question

As explained in 3.3.1, the focal question reflects our topic of concern and 20 year time horizon. Driving forces can be defined as such: 'drivers are major factors that are known, or believed, to be shaping or influencing the topic of concern, or to be liable to do so in the future' (Miles and Saritas, 2012).

3.3.8 Interview response

This section of the spreadsheet allows the interviewer to listen to the interviewee and record what they tell them. The 'description' field allows the interviewer to record the initial response and then the following prompts (i.e. 'what is driving this') allows the interviewer to move from the initial description into an understanding of driving forces. Further prompts are designed to keep the interviewer focused on what is required from the interviews – a greater understanding of the effect of driving forces on the focal question.

- *Timeframe*: gives an indication of whether the driving force is affecting skills and competencies now, or may emerge in the future.

- *Resources, research or people*: points us towards published research or further experts who may be able to give further information. If interviewees are not aware of published research or people working in a particular area, that is acceptable. It is important to remember that in horizon scanning we are looking quite broadly at things which may affect the future of complex systems, and so there is not always research about emergent areas.

The numbers (1 to 6) are there to help the interviewer organise the information. A key skill of an interviewer is to recap on what the interviewee has told them to clarify that they have understood the information that has been provided to them.

3.3.9 Interview response 2

This is for the interviewer to record ideas numbers 4 to 6 given by the interviewee. It repeats the semi-structured format as above.

3.3.10 Close script

Thank the interviewee for their time and ask them if there are any areas or topics that they would expect to have been covered that have not been covered, if they have any further questions or would like to receive further information on the project.

3.3.11 Post interview

If, for example, the interviewee has asked for further information about the project, then it is important to record this within this section so any follow-up actions as a result of the interview alongside who is required to complete them are appropriately logged.

In terms of processing the information, the themes from semi-structured interviews can be grouped into themes to inform horizon scanning reports (for example, CfWI, 2013a) or to inform narrative scenario development (section 3.5).

3.3.12 Feedback information on the interview stage

Feeding back information to participants who have been involved in interviews is essential to show them how the information has been used and how it will be taken into account in the rest of the project, whether that is in scenario planning or Delphi stages. The poster below is an example of the type of templates which are available on the Joint Action website (www.euhwforce.eu).

Figure 7: Poster example for interview feedbacki (CfWI, 2014)

3.3.13 Examples of where this method is used

Country and organisation	Source
Belgium, Belgian Federal Public Service of Health	EU JA HWF pilot 2014 www.health.belgium.be
United Kingdom, Centre for Workforce Intelligence	www.horizonscanning.org.uk

3.4   Surveys

Survey research is a form of structured interviewing in that respondents fit their answers around your predetermined structure. Questionnaires can be used to gather information from a large group of respondents relatively quickly, particularly if it is internet-based. The type of sampling method depends on the purpose of the survey, the questions it is being used to address and the size, location and diversity of the target population. There are also practical questions to be considered such as whether a sampling frame for the target population exists.

The literature concerning interviews and surveys are often intertwined especially with regards to qualitative research methods. Within the context of workforce planning and horizon scanning the use of interviews is described in more detail within section 3.3.

> 'The survey is a systematic method for gathering information from (a sample of) entities for the purpose of constructing quantitative descriptors of the attributes of the larger population of which the entities are members.'
>
> (Groves *et al*, 2004).

3.4.1 Survey classification and types

Surveys can be useful for quantitative and qualitative analysis. To distinguish between the two classifications the definition provided below by Jansen is helpful, especially when considering in the sample diversity required and context of using for a workforce study at a national, european or global level.

> 'The qualitative survey is the study of diversity (not distribution) in a population.'
>
> 'A qualitative sample should represent the diversity of the phenomenon under study within the target population.'
>
> (Jansen, 2010).

Surveys can further be categorised by type:

- **Questionnaire** - usually completed by the respondent in paper or web-based
- **Interview** - completed by the interviewer when deployed via the telephone, in groups or face to face.

How the survey is delivered should be considered as part of the design stage. The literature identifies five types of survey design. Considerations include clarity on the topic of interest, the stakeholders involved, structure and resources avalable. Cost can be considered in terms of overall effort and resources that might be expended.

Table 2: Typical features of the five survey designs (Check, 2012)

Design	Manner of Administration	Setting	Questionnaire Structure	Cost
Mailed survey	Self	Individual	Mostly structured	Low
Group survey	Self	Group	Mostly structured	Very low
Phone survey	Professional	Individual	Structured	Moderate
In-person interview	Professional	Individual	Structured or unstructured	High
Web survey	Self	Individual	Mostly structured	Very low

It is also important to answer key questions about the intended survey to assist with the selection of the type of survey to be deployed. The table below provides a selection of questions to assist with this process as described by Trochim, 2006.

Population issues	Can the population be enumerated? Are there language issues? Will the population co-operate? What are the geographic restrictions?
Sampling issues	Is there data available? Can respondents be found? Who is the respondent? Are response rates likely to be a problem?
Question issues	What types of questions can be asked? How complex will the questions be? Will screening questions be needed? Can question sequence be controlled? Will lengthy questions be asked? Will long response scales be used?
Content issues	Can the respondents be expected to know about the issue? Will respondent need to consult records?
Bias issues	Can social desirability be avoided? Can interviewer distortion and subversion be controlled? Can false respondents be avoided?
Administrative considerations (Trochim, 2006).	Cost, time, facilities and personel

3.4.2 Examples of surveys used within a workforce planning context

Below are two examples of surveys that have been used within Spain and England. The Spanish excerpt describes the scope and process undertaken to acertain a trend of demand for medical specialists out to 2025.

Spain – Use of surveys as part of the national workforce planning process

At 2008, a survey to a group of experts took place, with a focus on the trend of demand for medical specialists until 2025. Participants in this group of experts were:

- Subgroup of more than 20 experts in HWF planning, catalogue of health services, health plans and health statistics, that work in the Ministry of Health
- Subgroup of experts in HWF planning and management from 11 autonomous communities.
- 43 medical specialists from clinical care practice, representing each of the existing medical specialties.

Each of the respondents was asked to weigh the trend in demand for every one of the medical specialties in the 2009-2025 period. The obtained outcome was having the demand of medical specialties classified into the following categories:

1. Crescent
2. Crescent-stable
3. Stable
4. Declining

Within England, the CfWI was commissioned to deliver a survey on and report findings for the public health consultant and specialist staff survey during 2013. The survey provided a snapshot of career intentions and issues affecting recruitment and retention within the public health specialist workforce since changes to the public health system during 2013 which involved responsibility for public health transferring from the NHS to local authorities.

Figure 8: Job satisfaction scores as part of a workforce survey (CfWI, 2014c)
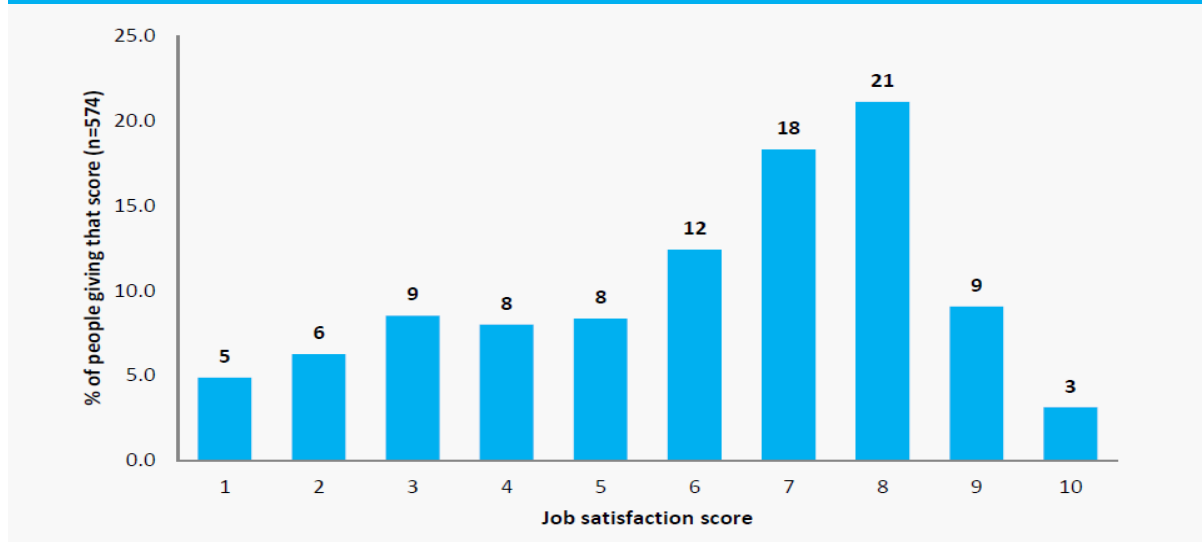
3.4.3 General principles before administering a survey

The scope of surveys and the data that is to be collected can be informed by desk research such as literature reviews (section 3.2) and refined through interviews (section 3.3) with key informants (for an example of research which identified key stakeholders for interview and how these interviews were used to inform a quantitative survey, see Humphries *et al,* 2012).

When developing all types of survey instruments, it is necessary to pretest the questions under the same conditions it will be administered in and with a member of the group you wish to include and learn about (Bernard, 2006). Using this method and encouraging the people testing the survey to ask questions about each item enables you to clarify the meaning of questions so that they can be refined and targeted more precisely. This also provides an indication of the time necessary for respondents to complete the survey which can be used in the information used to publicise the survey to attract respondents to complete it.

Data collection protocols may apply in countries and so information collected may have to be stored in particular ways which need to be followed in advance of the survey being administered. It is best practice to publish these protocols in disseminating the results of surveys (see, for example, *Public health consultant and specialist survey*, CfWI, 2014c).

You may also wish to set exclusion criteria as part of a survey to ensure that you are collecting information from or about the workforce that you have identified. Care over sampling methods allows a generalisation of results to an overall population.

3.4.4 Examples of where this method is used

Country and organisation	Source
Belgium, Belgian Federal Public Service of Health	www.health.belgium.be
Spain, Ministry of Health, Social Services and Equality (MSSSI)	www.msssi.gob.es
United Kingdom, Centre for Workforce Intelligence	www.cfwi.org.uk

3.5   Scenarios

This section takes general and relevant points from the CfWI's *Technical paper series* (CfWI, 2014a) and MS submissions as part of the development of this document.

3.5.1 Scenarios and their use in health workforce planning

A scenario is 'an internally consistent view of what the future might turn out to be – not a forecast, but one possible future outcome'(Porter, 1985).

> 'It is important that we think deeply and creatively about the future, or else we run the risk of being surprised and unprepared. At the same time, the future is uncertain, so we must prepare for multiple plausible futures, not just the one we expect to happen.
>
> Scenarios contain the stories of these multiple futures, from the expected to the wildcard, in forms that are engaging. A good scenario grabs us by the collar and says, 'Take a good look at this future. This could be your future. Are you going to be ready?''
>
> (Bishop *et al*, 2007).

There are many ways that scenarios can be used, as noted by Wright, Bradfield and Cairns (2013):

- **sense-making**: a one-off exploratory question-raising scenario project

- **developing strategy**: a one-off decision-making scenario project

- **anticipation**: an on-going exploratory scenario activity

- **action-based organisational learning**: an on-going decision-making activity.

Scenario thinking focuses on how the future might evolve and are useful for workforce planning since it is not possible to predict the future accurately. Scenarios are used to describe imaginative, plausible and challenging ways that the future might unfold.

> 'Scenario thinking can facilitate 'vigilance' in strategic thinking – in that alternative futures are thought through and strategic options can subsequently be evaluated against these futures. The process of scenario thinking enhances the evaluation and integration of information and promotes contingency planning for unfolding of both favourable and unfavourable futures.'
>
> Wright and Cairns (2011)

The use of scenarios within the EU for health workforce planning purposes was indicated within Belgium, Finland, the Netherlands and England during survey research conducted during 2013 for WP6 in the Joint Action on Health Workforce Planning and Forecasting.

3.5.2 Types of scenario

Scenarios can be grouped into three broad areas: predictive, exploratory and normative (Börjeson *et al*, 2006):

- **Predictive scenarios** are concerned with **what is going to happen** in the future.

- **Exploratory scenarios** are concerned with **what might happen** in the future.

- **Normative scenarios** are concerned with **how a desired future might be reached**.

This categorisation covers the probable, possible and preferable futures.

For these user guidelines, we describe an approach that is comparable to exploratory scenarios but with adaptations for workforce planning and based on experiences shared by practitioners.

3.5.3 Scenario generation

The generation of scenarios often involves two main parts:
- scenario workshops or meetings to generate the scenarios
- quantifying scenarios

3.5.4 Scenario workshops or group meetings

The involvement of stakeholders from a wide range of interested parties, not just experts, to examine the topic of interest is essential to generate scenarios that will be meaningful and articulate the possible plausible futures that may unfold. The use of workshops or group meetings is generally recognised as the approach that yields best results, enhances participation and assists with agreeing possible responses or recommendations later in the planning process. The high level stages, as used by England, when constructing scenarios is shown in the figure below.

Figure 9: High level stages of scenario generation with stakeholders, CfWI (2014)
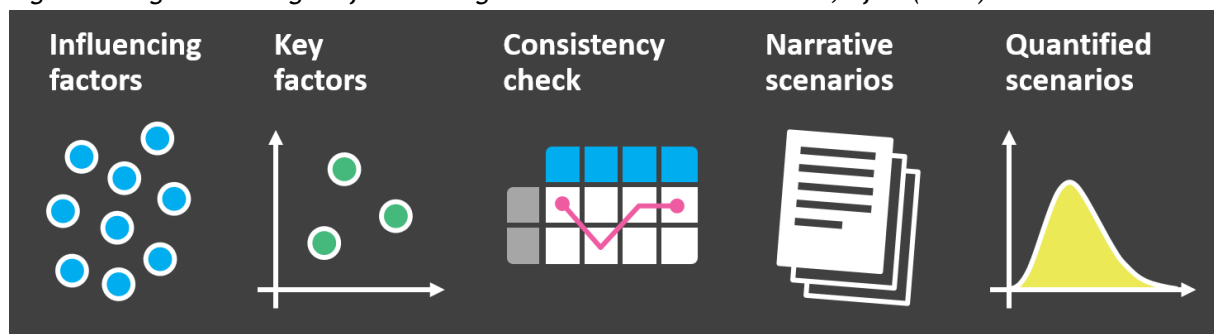
The format or shape of a scenario workshop will need to have certain key elements:

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Preparatory research

A scenario workshop or meeting will require preparatory research and evidence collection such as horizon scanning, literature reviews and other applicable quantitative / qualitative evidence gathering methods.

A focal question

Participants of the workshop require the topic of interest to be framed such that the session can concentrate on the topic in question and does not stray into other areas. The focal question, as explained in 3.3.1, can be derived from the original objective of the research being undertaken and used in preceding stages such as horizon scanning. The focal question overleaf has been used as part of the Joint Action on Health Workforce Planning and Forecasting's horizon scanning activities to investigate and deliver 'D062 Report on the future skills & competencies'.

> 'Thinking up to the year 2035, what are the key driving forces that will influence the skills and competencies needed in the health workforce?'
>
> Focal question used for horizon scanning interviews (EU Joint Action HWF, forthcoming)

Key factors and trends

It is important to review and discuss the key issues and driving forces that will affect the system with the option for participants to add factors that may be pertinent.

A health and care system can be considered to be composed of a set of interrelated **factors**. Factors can be quantities (facts like the number of people in a workforce) that describe the system, or subjective (qualitative) measures such as "happiness".

Factors are linked to each other through cause and effect relationships. A change to a factor will influence one or more other factors in the system. The impact of changing a factor on related factors may take time to manifest. Therefore, changing a factor may directly, or indirectly, have an eventual impact on the workforce supply and/or demand.

> **Key Factors** are the factors that are most significant to the behaviour of the health and social care system.
>
> **Trends** are historical changes over time to indicators. Indicators can be related to particular factors.
>
> Centre for Workforce Intelligence, 2014a

The scenarios generated by the workshop take the form of stories that concentrate on the key uncertainties that could influence the future – and therefore workforce demand and supply.

It is important that these stories have sufficient detail to enable people to make judgements about the intrinsically uncertain parameters that may vary between scenarios. For example, if intake to training is a parameter in the model, then the scenarios need to describe the economic, political and social factors that could influence the decision of individuals to join a training course.

> Dental scenario extract taken from the MDSI project (CfWI, 2012).
>
> 'From the second decade of the twenty-first century and onwards more investment was made in NHS dentistry, and resources and technology became more readily available. This was a result of three factors: general economic recovery, the commitment of the government (all parties) to the results of the contract pilots, and the increased emphasis on dentistry within the NHS. The implementation of the contract pilots also impacted the shape of the dental workforce, as it increased incentives to employ dental care professionals. In the transition period that followed, some associate dentists were made redundant as 'skill mix' increased and more dental care professionals were employed. Overall though, this did not reduce the popularity of dentistry as a career choice and the number of dental undergraduate applicants remained high.'

3.5.5 Quantifying scenarios

A concluding part of scenario process is to analyse the responses from rounds of refinement and methods such as Delphi.

Scenario quantification in workforce planning is necessary to move from purely qualitative analysis to the incorporation of quantitative aspects and analysis. The combination of these approaches allows further evidence gathering as well as refinement of the analysis concerning the focal question.

Scenarios need to be quantified to enable models to be built that can be used to carry out policy analysis as part of a workforce review or project. This requires parameters that are inherently uncertain to be estimated. These parameters typically vary from scenario to scenario. This quantification is typically reached using judgements from experts using a formal and defined protocol such as elicitation methods or Delphi exercises (section 3.6).

3.5.6 Examples of where this method is used

Country and organisation	Source
Belgium, Belgian Federal Public Service of Health	www.health.belgium.be
Belgium, National Institute for Disease and Invalidity Assurance (RIZIV/INAMI)	www.inami.fgov.be
Finland	http://www.stm.fi/en/frontpage
Netherlands, Capaciteitsorgaan	www.capaciteitsorgaan.nl
United Kingdom, Centre for Workforce Intelligence	www.cfwi.org.uk

3.6   Delphi exercises

3.6.1 The Delphi technique

The Delphi method was developed by the RAND Corporation in the 1950s for military purposes (Dalkey and Helmer, 1963). It is a systematic consensus process for collecting and refining the knowledge of a group of experts (Linstone and Turoff, 2002) and is well known for its use in futures research and forecasting. Delphi elicits responses from a group of experts to a series of questions using their judgement. Often the aim is to achieve expert consensus, but not always. A variant called 'Policy Delphi' (see Tapio, 2002) seeks to use experts to identify alternative options supported by evidence.

Delphi belongs to a class of methods called mixed approaches or elicitation methods, which joins behavioural aggregation where experts interact, with mathematical combining of judgements. It has a quantitative element so can be considered semi-qualitative in the way that it assists to approximate data.

Anonymity of experts is a characteristic of Delphi intended to reduce social and political pressures and influences. However, this is at the expense of participants being able to have open debate to achieve consensus. The key assumption is that anonymity is preferable to group discussion, since social interactions may influence the responses. Of course, it may be that it in some situations the opportunity for a group discussion would actually improve the responses of the group Attention must be given to how the exercise is structured and conducted, and considerable time and effort is often required.

The overall goal is to obtain expert consensus on a variable or parameter or factor that is needed within quantification and any subsequent workforce modelling stages. The use of Delphi in this way can be useful for workforce planning when considering different scenarios and futures or even as a base lining activity if there is an absence of quantitative data or information.

3.6.2 Delphi usage

The use of Delphi is often deployed online or remotely and has the following advantages:
- wider participation of experts especially if experts are in other countries or time zones.
- more convenient, cost effective and quicker to deliver.
- using dedicated software to guide the process accurately.
- participants in the online workshop / stage can remain anonymous and therefore other panel members are not able to dominate using their position or reputation.

Tapio (2002, pp 87-92) lists eight problems with the Delphi method:
- biased selection of the panellists
- disregarding organisational opinions
- forgetting and not exploring disagreements
- ambiguous questionnaires
- oversimplified structured inquiry which does not leaving room for new ideas
- feedback reports without analysis
- forgetting the arguments
- lack of theory.

Delphi is an iterative process where experts provide their individual estimate for the parameter under consideration, together with their reasoning. The facilitator then anonymously shares these answers and reasons with all the other participants in the exercise. The participants then have the opportunity to revise their estimates over two or more rounds. The figure below describes the steps that might be involved with multiple rounds.

Figure 10: The Delphi technique Heuer and Pherson (2011)
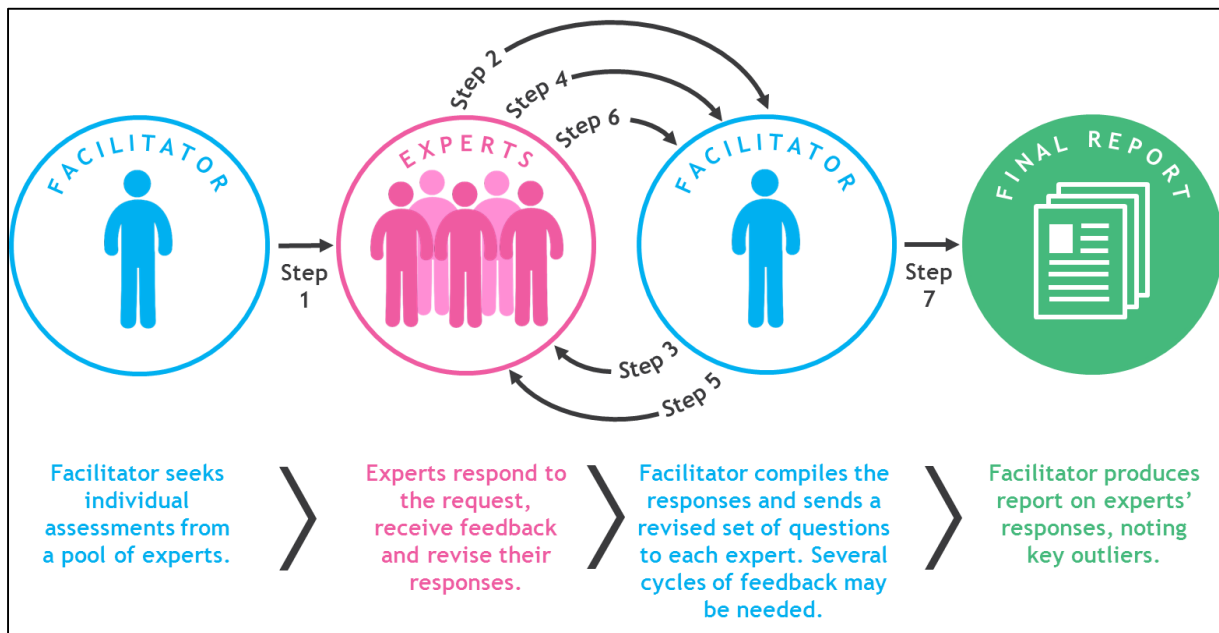
As a prelude to designing the questions that will be asked in the workshop it is essential to carefully construct these questions so they are clear and elicit the desired information.

Some examples of supply and demand side questions are shown below and the values to those questions shared within *Strategic review of the future pharmacist workforce* (CfWI 2013b). These questions were asked via an online process over two rounds with respondents' answers and justification visible to all participants after round one.

> **Delphi questions – supply assumptions**
> The following questions were asked to help inform the supply side of the modelling:
> - What do you think would be the change to the average participation rate of pharmacists in 2040?
> - What do you think would be the percentage of pharmacists leaving the workforce for reasons other than retirement in 2040?
> - What do you think would be the change to the average retirement age for pharmacists in 2040?
>
> **Delphi questions – demand assumptions**
> The following questions were asked to help inform the demand side of the modelling:
> - What do you think would be the percentage change in the overall need of patients and the population for pharmacists in 2040?
> - What do you think would be the percentage change in the overall level of service provided by pharmacists in 2040?
>
> Source: Strategic review of the future pharmacist workforce, Delphi questions asked (CfWI, 2013b).

The Delphi exercise and technique is quite flexible and can be combined with other methods such as:
- Scenario planning and quantification to define and agree parameters for uncertain aspects of workforce studies.

- In combination with other statistical methods for elicitation that use expert face to face meetings and Delphi stages. This is presently in use as part of the CfWI Horizon Scanning 'Horizon 2035' initiative in England where it is important to obtain a probability distribution rather than a single value as generally produced from Delphi alone.

- The use of 'electronic group decision rooms' and workshops, such as those used in the Netherlands as part of adapting to the workforce review being performed.

For an example of the use of a modified delphi in other areas of health decision-making see NICE, 2013 (p54-57).

3.6.3 Examples of where this method is used

Country and organisation	Source
Netherlands, Capaciteitsorgaan	www.capaciteitsorgaan.nl
United Kingdom, Centre for Workforce Intelligence	www.cfwi.org.uk

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5. Glossary of key terms

Term	Defined as:
Complex systems	Systems where too many factors are interacting to make reliable predictions about what will happen (Gloubermann and Zimmerman, 2002).
Expert	Any person 'with comprehensive or authoritative knowledge in a particular area' (Caley *et al*, 2014).
Focal question	A question used to bound the topic of concern. Commonly used in horizon scanning interviews and scenario generation workshops to concentrate stakeholder and expert input.
Horizon scanning	'A systematic examination of information to identify potential threats, risks, emerging issues and opportunities... allowing for better preparedness' (House of Commons, 2014).
Key factors	The factors that are most significant to the behaviour of the health and social care system. Factors are linked to each other through cause and effect relationships. A change to a factor often will influence one or more other factors in the system.
Qualitative data	Information collected using qualitative methodologies to identify and describe key factors in the health workforce system which are likely to affect the supply and demand of workforces.
Qualitative methods	Methodologies that are used to gather qualitative information on key factors which are likely to affect the supply and demand of health workforces through techniques such as interviews, document analysis, or focus groups. Includes methods to quantify uncertain parameters for forecasting models.
Scenario	An internally consistent view of what the future may turn out to be – not a forecast, but one possible future outcome (Porter, 1985). Scenarios can be grouped into three broad areas: predictive, exploratory and normative (Börjeson *et al*, 2006). Scenarios are used for estimating the likely effects of one or more factors, and are an integral part of situation analysis and long-term planning.
Stakeholders	'Any identifiable group or individual who can affect the achievement of an organisation's objectives or who is affected byt he achievement of an organisation's objectives' (Freeman and Reed, 1983). Specifically in health workforce planning this can be groups or individuals that have an interest in the organisation and delivery of healthcare.
Trends	Trends are historical changes over time to indicators. Indicators can be related to particular factors.

Annex 1: WP6 in the Joint Action on Health Workforce Planning and Forecasting

The Joint Action on European Health Workforce Planning and Forecasting is a three-year programme of work – running from April 2013 to March 2016 – involving partners representing countries and stakeholder groups from across the European Union. The Joint Action (JA) is 50% funded by the Health Programme of the European Union.

The general objective of the JA is to create a platform for collaboration and exchange between partners to better prepare for the future of the health workforce.

To do this the Joint Action program is divided into seven specific projects, or Work Packages (WP). There are three core work packages (as shown in figure 1) which are focused on collecting and analysing information on health workforce planning in the Europe Union: WP4 is concerned with European data collection, WP5 looks at quantitative methods of health workforce planning and WP6 is focused on horizon scanning.

Figure 1: WP6s position in the Joint Action (CfWI 2014, new)

WP 1 Coordination of the JA

WP 2 Dissemination of the JA

WP 3 Evaluation of the JA

WP4 Data, migration and mobility

WP5 Quantitative methodologies

WP6 Horizon scanning

WP 7 Sustainability of the JA

AIMS:
To increase capacity (expertise in HWF)
To produce useful tools (guides, websites, training material etc.)

And to apply the (combined) JA expertise and tools to:
• formulate advice on HWF to policy makers
• help MS with their HWF planning activities (training, coaching, implementation)

Annex 2: WP6 Team and List of WP6 partners

The United Kingdom WP6 team comprises of:

WP6
Cris Scotter
Greg Allen
Matt Edwards - WP6 Leader
John Fellows
Alison Harbord
Alexander Lee

The United Kingdom is supported by Partners and experts, divided into WP Leaders, Associated partners, and Collaborative partners, the combination of which forms the overall team. They are:

WP Leaders			
Country	Acronym	Name	Role
Belgium	BE-FPS	Michel Van Hoegaerden	Program Manager
Belgium	BE-FPS	Lieve Jorens	WP1 Leader
Slovakia	SK-MOH	Zuzana Matlonova	WP2 Leader
Europe	STAK-EHMA	Jeni Bremner	WP2 Leader
Europe	STAK-EHMA	Paul Giepmans	WP2 Leader
Finland	FI-MOH	Marjukka Vallimies-Patomäki	WP3 Leader
Malta	MT-MOH	Andrew Xuereb	WP3 Leader
Hungary	HU-SU	Zoltan Aszalos	WP4 Leader
Italy	IT-MoH	Giovanni Leonardi	WP5 Leader
Bulgaria	BG-MUV	Todorka Kostadinova	WP7 Leader
Europe	STAK-EAHC	Caroline Hager	EC – DG SANCO
Europe	STAK-EAHC	Leon Van Berkel	EC – DG SANCO
Europe	STAK-EC	Balazs Lengyel	EC – DG SANCO
Europe	STAK-EC	Antoinette Martiat	EC - CHAFEA
Europe	STAK-EC	Angela Blanco	EC – DG SANCO

Associated partners		
Country	Acronym	Name
Belgium	BE-FPS-BE	Pieter-Jan Miermans
Belgium	BE-FPS-BE	Gretel Dumont
Belgium	BE-FPS-BE	Aurelie Somer

Associated partners		
Country	**Acronym**	**Name**
Belgium	BE-FPS-BE	Pascale Steinberg
Belgium	BE-FPS-BE	Pascal Meeus
Finland	FI-MOH-FI	Marjukka Vallimies-Patomäki
France	MOH-FR	Michele Audeoud-Fauris
France	MOH-FR	Romann Datus
Germany	DE-UNI-HB-DE	Heinz Rothgang
Germany	DE-UNI-HB-DE	Melanie Boeckmann
Greece	EL-NSPHJ-EL	Despena Andrioti
Greece	EL-NSPHJ-EL	Vasiliki Papanoti
Hungary	HU-SU-HU	Zoltan Aszalos
Hungary	HU-SU-HU	Reka Kovacs
Iceland	IS-MOH-IS	Anna Bjorg Aradottir
Netherlands	CAPORG-NL	Victor Slenter
Netherlands	N/A	Lud Van der Velden
Romania	No allocated days	Marius Ungureanu
Slovakia	SK-MOH-SK	Miloslava Kovacova
Slovakia	SK-MOH-SK	Jozef Hvozdik
Slovakia	SK-MOH-SK	Zuzana Slezakova
Slovakia	SK-MOH-SK	Marian Nagy
Slovakia	SK-MOH-SK	Monika Kordulova
Spain	ES-MOH-ES	Juan Antonio López Blanco
Spain	ES-MOH-ES	Mercedes de Jorge
Spain	ES-MOH-ES	Luis Pallarés
Spain	ES-MOH-ES	Domingo Orozco
Spain	ES-MOH-ES	Antonio Company
Europe	STAK-CED	Nina Bernot
Europe	STAK-CED	Aleksandra Sanak
Europe	STAK-CED	Sara Roda
Europe	STAK-EFN	Paul De Raeve
Europe	STAK-EFN - BE	Silvia Gomez
Europe	STAK-EFN - BE	Fatima Pereira
Europe	EHMA	Paul Giepmans
Europe	EHMA	Jeni Bremner
Europe	STAK-HOPE	Isabella Notarangelo
Europe	STAK-HOPE	Pascal Garel
Europe	STAK-PGUE-BE	Jurate Svarcaite
Europe	STAK-PGUE-BE	John Chave
Europe	STAK-CPME-BE	Brigit Berger

Associated partners		
Country	**Acronym**	**Name**
Europe	STAK-CPME-BE	Sarada Das
Europe	STAK-CPME-BE	Christophe Lecourtois
Europe	STAK-UEMS	Frédéric Destrebecq
Europe	STAK-UEMS	Edwin Borman
Europe	STAK-UEMS	Jean-Baptiste Rouffet

Collaborating partners		
Country	**Acronym**	**Name**
Belgium	BE-FPS	Peter Willemé
Germany	DE-KBV	Filip J. Lassahn
Moldova	MD-MoH	Eugenia Berzan
Moldova	MD-MoH	Ala Nemerenco
Norway	NO-MoHCS	Jon Espelid
Norway	NO-MoH	Kristian Roksvaag
United Kingdom	UK-RCN	Matthew Hamilton
United Kingdom	UK-RCN	Peter Carter
Europe	STAK-EHFF	David Somekh
Europe	STAK-EMA	Mervi Jokinen
Europe	STAK-ENMCA	Tanja Schubert
Europe	STAK-ENMCA	Katy Thomas
Europe	STAK-EPSU	Mathias Maucher
Europe	STAK-HOSPEEN	Elisa Benedetti
Europe	STAK-IOM	Giuliana Urso
Europe	STAK-UEMO	Ferenc Hajnal
Europe	STAK-UEMO	Rita Cseke

Annex 3: Comparison of qualitative methods in health workforce planning and forecasting

This section identifies and classifies the qualitative methods used in a selection of MSs who are partners in WP6 in the EU JA HWF. This information was presented to WP6 partners at the 2014 London workshop.

Project research methods

A survey was issued to WP6 partners in the summer of 2013 and returns from Belgium, The Standing Committee of European Doctors (CPME), Finland, Germany, Hungary, the Netherlands, Norway, Spain and the United Kingdom were received. Qualitative methodologies (as defined in the survey guidelines), were listed from the returns (table 1). The returns were then analysed using grounded theory (Bernard, 2006), namely the identification of themes (table 3), an explanation of how the themes are linked (figure 3) and the presentation of the results with examples (p45-48).

Identification of qualitative methods

Table 1: List of methods identified by WP6

List of methods identified	MS
Statutory working groups containing professional expertise discuss to reach consensus agreement on future scenarios to input into the model – insights are based on the expertise and background of the participants.	Belgium
The Future Table used to create, for example, business as usual, desirable, undesirable and surprising scenarios.	Finland
Literature reviews of factors for change.	UK, Netherlands
Group discussion with a wide range of experts.	All
Project-based scenarios used for supply and demand projections.	UK, Belgium, Finland, Netherlands, Spain
Expert agreement on a single point value or alternatively, a most likely and a least likely value, to input into the model.	Belgium
Meetings and focus groups to discuss the latest research.	Netherlands
Field trips.	Netherlands, UK
Meetings with professionals, board members, researchers, government.	All
Interviewing experts.	Belgium, UK, Netherlands, Finland
Delphi process.	Netherlands, UK
Semi-structured horizon scanning interviews.	UK
Model verification and assumption generation.	UK
Electronic group decision rooms.	Netherlands
Identifying experts by literature on forecasting, from colleagues, by government, by universities.	Netherlands, UK
Participative policy analysis and development.	Netherlands, UK
Survey to a panel of experts.	Spain,

We can group these methods into overall categories of qualitative information collection in table 2.

Table 2: Grouping of methods into overall categories of collection by WP6

Qualitative information collected by	Method and example(s) of how they are used
Desk research	**Literature reviews** to identify trends, factors and policies which may affect workforces; and to identify experts.
Interviewing experts and stakeholders individually	**Identifying experts and stakeholders** as part of a statutory or organisational group, or by methods such as chain referral sampling. **Semi-structured interviews** of stakeholders and experts to identify trends, factors and policies which may affect workforces. Individual meetings to provide workforce intelligence.
Group Meetings of experts and stakeholders	Structured meetings to generate **scenarios.** Structured online involvement (such as a **Delphi process** or electronic group decision rooms) to reach consensus on numerical values for inclusion in a forecasting model. Group meetings to reach consensus on numerical values for inclusion in a forecasting model; to provide workforce intelligence and focus groups to discuss research developments.
Observation of practice	Field trips to observe the practice of the workforce (for example in clinical settings) to enhance the workforce planners' understanding.

Taking this a stage further into generalised qualitative research methods where practical examples concerning health workforce planning and forecasting are available, we arrive at table 3, which provides the structure of section 3 of the user guidelines.

Table 3: Selected qualitative methods for the user guidelines identified by WP6

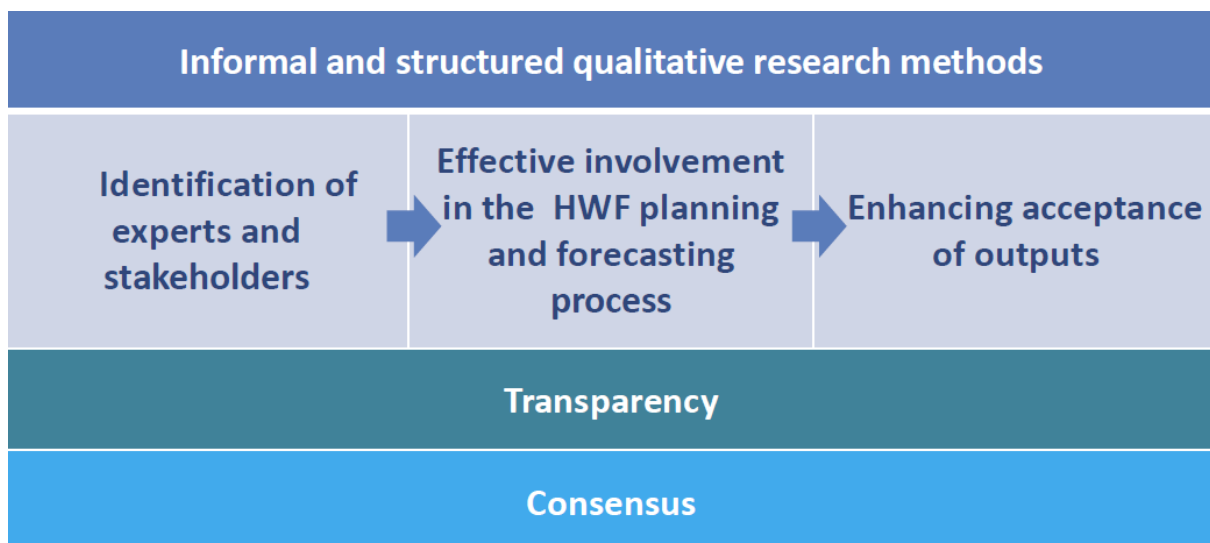| Selected qualitative methods |
|---|
| 1. Identifying experts and stakeholders |
| 2. Literature review |
| 3. Interviews (using semi-structured horizon scanning interviews as an example) |
| 4. Surveys |
| 5. Scenarios |
| 6. Delphi process |

Why are countries using qualitative methods?

In response to this specific question in the survey, MSs highlighted the necessity of using qualitative methods to enhance health workforce planning and forecasting. Moving beyond the use of quantitative data in health workforce planning and improving qualitative inputs to the process was described by Belgium and the United Kingdom:

'without qualitative input, health workforce forecasting is limited to a quantitative approach based on the observable historical data ("planning for yesterday")'. (BE)

'to generate or validate values used in modelling assumptions where robust quantitative data is not available [and] to provide information that cannot fully be captured in qualitative form (e.g. clinicians' view on current workforce challenges).' (Wales)

Classification of themes

Table 3: Classification of themes by WP6

Taking each theme in turn and using quotes and discussion to illustrate the theme:

1. Informal and structured qualitative research methods

There is a continuum of informal to structured qualitative research methods used by partners. However, this does not imply a hierarchy of approach, as noted in the Feasibility Study (European Commission, 2012) national-specific drivers of health workforce planning and forecasting demonstrate that each system should be assessed by its own criteria and the aims of health workforce planning and forecasting. However, the desire to use more structured (and reproducible) research methods is reflected by partners such as Belgium ("the members of the working group arrive at consensus in a moderated discussion but this process can be less transparent and less scientific than other possible methods").

2. Identification of experts and stakeholders

For clarity if we define stakeholders as 'any identifiable group or individual who can affect the achievement of an organizations objectives or who is affected by the achievement of an organization's objectives' (Freeman and Reed, 1983) and use a straightforward definition of an expert as someone with specific relevant knowledge on a particular area; the returns from MSs show us that there is a need to both define nationally these two broad groups through (for example) non-probability sampling methods, such as in the Netherlands, the United Kingdom and Spain:

"Identification occurs by literature on forecasting, by colleague experts, by authority, by government, by research desks and by universities" (NE)

"Representatives are sought from different perspectives and from the organisations involved in commissioning, standard setting, and regulation of the profession or specialty, as well as practising professionals and, on occasion, students." (Northern Ireland)

"In 2008, the Ministry of Health organised a study on the trends and needs of specialists per population, from 2006 to 2010. A survey was made to a group of 20 experts on HWF planning. They were selected from a broad sample of professionals from the Ministry of Health, scientific societies, specialised healthcare training. We also involved a subgroup of experts in HWF planning from 11 autonomous communities" (Spain)

3. Effective involvement in the hwf planning and forecasting process

The choice and development of health workforce planning models is context dependent (Kuhlmann *et al*, 2012) and the range of methods used in different national contexts also reflects the reality that different methods have associated risks and benefits. Belgium provides both an example of effective use in the process and also highlights a challenge of effectively involving experts and stakeholders in interactions with a workforce model that provides supply and demand projections, in that experts in one field are not necessarily experts in HWF planning and forecasting and so work needs to be done to facilitate their engagement effectively.

"The representation and participation of all of the relevant stakeholders in health workforce planning through this system of agreed consensus allows for a varied input and close involvement in the planning process." (BE)

"The participation of the different stakeholders, each with his or her specific background and expertise, sometimes creates difficulties with regard to the knowledge and understanding of the functioning and possibilities of the [model]." (BE)

4. Enhancing acceptance of outputs

The returns highlight that the process of HWF planning and forecasting, and the outputs of models, is for the purpose of informing policy decisions (such as numerous clauses). In this, the returns highlight the challenges of providing a coherent and linked methodology to all stages, as with Finland ("the challenge is, therefore, to coordinate qualitative foresight and quantitative anticipation more

effectively"). There is also a relationship between forecasts being seen as robust, and that this may be linked to the appropriate experts and stakeholders being involved:

"We think that we are on the right track in our estimations... [which] might be due to the fact that the experts we consult are involved by this so called "participative policy analysis and development."(NE)

5. Transparency

Transparency cuts across all of the themes. Building on the above point about effectively involving stakeholders and experts, there is a stated need to be transparent about the level of uncertainty involved in hwf planning and forecasting, as highlighted in returns from the United Kingdom and Norway:

"The medical/dental modelling allows multiple stakeholders to be involved in the process of whether a particular specialty is likely to face a shortage or oversupply of staff in the future. This means that the forecasts are generally accepted as being as accurate as they can be, rather than being a 'black box' exercise which is then ignored due to misplaced fears about the robustness of the forecasts." (Wales)

"In order to create a more sophisticated model we should strive to include both regional and local authorities in the planning and modelling process, this would strengthen the understanding of the model and its results." (NO)

6. Consensus

Consensus cuts across all of the themes. As translating qualitative information into quantitative data is challenging, and within the general context of potential data limitations, there is a need to seek and obtain consensus from experts and stakeholders at multiple points in a HWF planning process, whether that is on generating a value as an input to a model or on the final recommendations which emerge from the workforce planning process. The returns from Belgium and the Netherlands, describe the ways in which this consensus is sought in their national contexts.

"The different lobby groups active on the political terrain are represented in the planning commission, which diminishes the risk of future political conflict."(BE)

"The experts are from all three parties: insurance companies, universities/hospitals, and the professionals. They have to reach consensus." (NE)

Discussion

Figure 3 shows the linkage of themes from the analysis of returns. As qualitative methods are on a range from informal to structured, the appropriate use of qualitative methods theoretically allows you to identify the right people (experts and stakeholders), involve them effectively in the process to enhance the acceptance of outputs, with a feedback loop to reflect that methods may evolve through use. This happens within the context of the themes of transparency and consensus, whilst acknowledging that different methods have different risks and benefits.

National policy settings, or the institutional arrangements by which MSs conduct health workforce planning and forecasting, set the overall strategic framework in which these processes occur.

Looking at the qualitative methods within MSs and the enhanced platform of sharing information provided by the Joint Action on health workforce planning and forecasting, it seems likely that expert networks formed during the JA may enhance the sharing and use of information collected through using qualitative methods where that information is applicable to other MSs.

Figure 3: Linkage of themes by WP6 (CfWI, 2014)
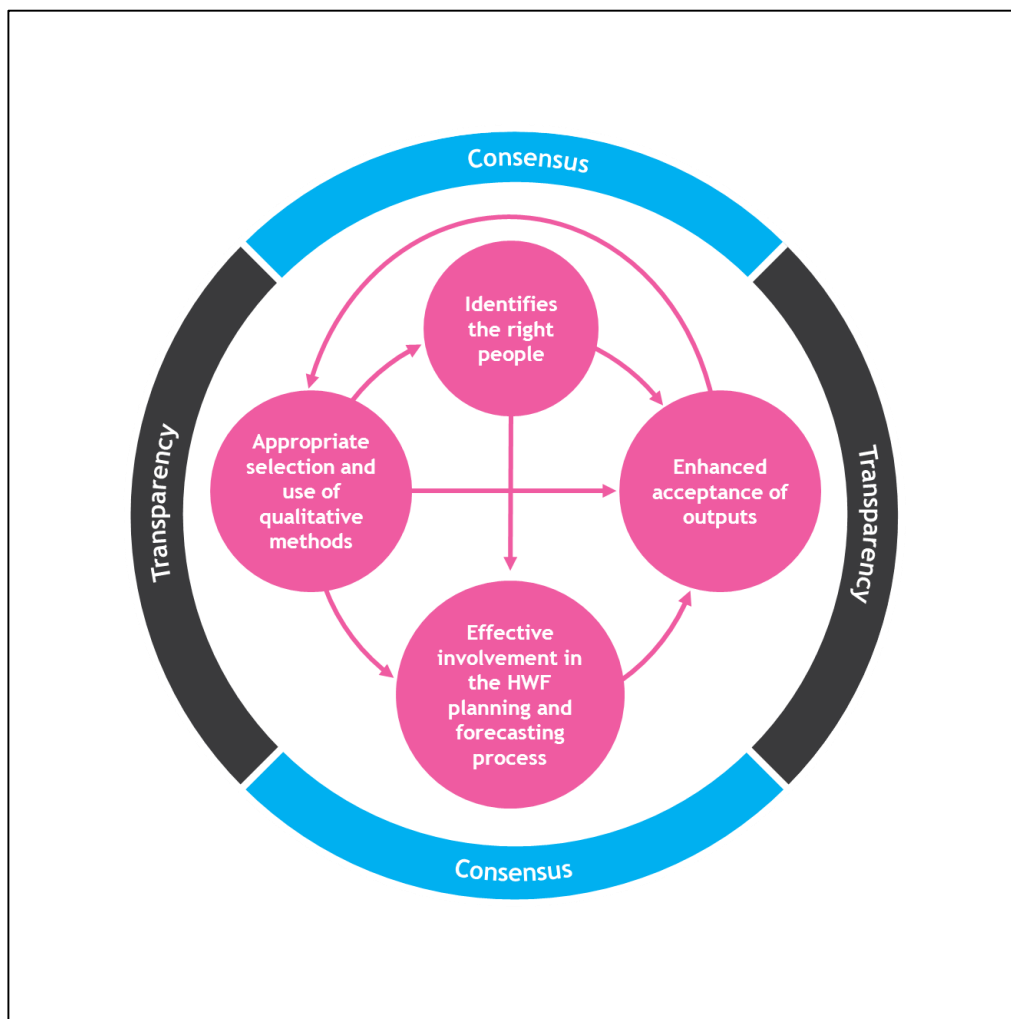
Annex 4: WP6 MS Partner Profiles

These profiles are reproduced here in the same language as they were submitted to WP6. We have not edited or translated any of these submissions and the approaches are described in their own words.

A4.1) Belgium

Overview of the health workforce planning process (series of actions taken)
The central actor in the Health Workforce Planning is the Planning Commission for the Medical Supply (French*: Commission de Planification de l'Offre Médicale / Dutch :Planningscommissie van het Medisch Aanbod*). This organ, composed of representatives of the different health professions, universities, health insurance, different government levels and invited experts, reflects on current and future challenges on the terrain of the health workforce. It advises the minister of Health on this issue in general and more specifically, whether access limitations ("quota") need to be applied and if so, at which level these quota need to be set. The planning commission is assisted by the Workforce Planning Unit at the Federal Public Service of Health, which provides administrative, scientific and statistical support. The commission is organised in Working Groups for the different Health Professions. In 2013, working groups are active for the following professions: physiotherapist, nurse, dentist and medical doctor. The process can be summarised as follows: - The planning commission monitors the workforce levels and trends of the different health professions using the available statistical information and detects bottle-necks   - Where necessary further research and data-gathering is conducted (using the resources of the Workforce Unit or via public tender process)   - The collected quantitative data is analysed, and in combination with qualitative input from the members of the working groups based on their relevant professional expertise, consensus agreement is reached on possible future scenarios   - The agreed upon future scenarios are fed into the mathematical planning model to calculate the projected future workforce levels   - On the basis of these projections, policy recommendations are made to the Minister of Health, by the planning commission   - The Minister can take corresponding policy actions
Overview of the health workforce planning model
The Belgian Harmonized Mathematical Planning Model (BHMPM) originates from an effort to harmonize several existing mathematical planning models for different health professions. This harmonization aimed to standardize the Belgian health workforce planning. The BHMPM is conceived as a universal model, i.e. applicable for each of the different health professions implicated in workforce planning in Belgium. The BHMPM is used as a tool in the evaluation of health workforce policy and future workforce needs. It does not determine which goals and objectives have to be attained, but can be used to see how

objectives, set by policy-makers, can be reached. It is also able to predict future shortfalls in relation to a pre-defined minimum 'desired density', i.e. the number of health professional for a given population.

The model is a stock and flow model, in which the future size of a given starting stock is influenced by yearly in- and outflows.

Essential in the correct functioning of the BHMPM is a precise definition of this starting stock. Exact information about the size and composition of the current workforce is a *conditio sine qua non* 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 labour pool, immigration, extra flows (e.g. people entering health sector from other sectors mid-career). Outflow is determined by, for example, the survival rate, halting of activities, emigration.

Expected changes concerning 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 BHMPM also produces expected densities (number of health professionals per 1000 inhabitants).

In its current incarnation, the BHMPM is a web-application with an Oracle back-end. It is accessed via a web browser and hosted on a web-server at the Ministry of Health. An administrator at the Ministry assigns 'roles' which have different levels of access. Users can access the application both inside and outside the Ministry, after receiving prior permission, identifying themselves via the Belgian nationwide e-id system.

The data managers of the Workforce Planning Unit upload all the required data for the proposed future scenarios. Users can then select parameters from among the various available parameter versions for each variable and create and save their own scenarios. The outcome of a scenario is saved as an excel-file with both numerical and graphical elements.

The mathematical formulas which calculate the outcomes based on the user-selected parameters are hard-coded into the application. One exception to the general data input method is the access quotas, which can be adapted directly by users and do not need prior data preparation.

Qualitative data collection

Qualitative data collection:

During the meetings of the working groups of the different health professions, hypotheses about future developments are formulated.

These insights are based on the expertise and background of the participants in the working groups. Next to the representatives of various sectors mentioned earlier, the working group can invite external experts to contribute to the discussion.

The goal is to construct various alternative future scenarios. These scenarios are then "run" in the mathematical model and their implications for future workforce levels and densities are calculated.

The members discuss and try to find common ground with regards to the main drivers influencing offer and demand for the different health professions.

The Belgian planning commission is satisfied with this working method, which can deliver tangible results with limited resources (human resources & budget).

Stage in the planning process:

The qualitative data is collected at the stage of future scenario development.

After the initial testing of a formulated hypothesis, the results are presented to the working group. At this stage, further qualitative input is possible to fine-tune a scenario/hypothesis.

Furthermore, specific workshops can be organised to tackle a certain topic with invited experts and the members of the planning commission.

How the qualitative data is collected:

In the working group meetings, the Workforce Planning Unit is present to take notes on the expressed viewpoints and agreements. Meeting reports are created and the collective vision of the participants on the evolution of the factors (drivers) is translated into input files for the mathematical model.

Important to note is the fact that the created scenarios result from the viewpoints of the participants, who represent their different professions and organisations.

Who collects the qualitative data and who it is collected from:

The composition of the working groups is defined by law (re-constituted periodically). Each individual member represents the viewpoint of the organisation or institute he/she belongs to.

On its own initiative each working group can invite experts to assist the working group in its activities.

Analysis of qualitative information
- **How is qualitative information processed?**
- **Stages which use expert groups**

The qualitative data collected from our working groups (the expert group in question) is fed into the mathematical planning model in order to calculate future workforce levels and detect possible choking points and future shortfalls.

In the discussions the qualitative input of the different experts is analysed and consensus is reached.

A4.2) Finland

Overview of the health workforce planning process (series of actions taken)
The process of anticipating the workforce demand and educational needs is shared between the Government Institute for Economic Research (VATT under the Ministry of Finance) and the National Board of Education (FNBE under the Ministry of Education and Culture). One of the responsibilities of the FNBE is to coordinate information networks and services in the education sector and produce indicator data and information for anticipating educational needs (http://www.oph.fi/english/about_us).

Long-term workforce forecasts are produced by VATT and commissioned by a collaborative group of four ministries. They are the Ministry of Employment and the Economy, Ministry of Finance, Ministry of Education and Culture and Ministry of Social Affairs and Health. The workforce planning process in the FNBE makes use of the results from VATT in order to provide forecasts on educational needs and proposals for entrant targets.

The present long term forecasting on workforce demand covers years between 2008 and 2025. On the basis of these forecasts the present entrant targets for 2011-2016 were adopted by the Government as part of the development plan for education and university research.

The latest English publication on education, training and demand for labour in Finland by 2025 was published by the NBE in 2012. This publication is available on the internet (http://www.oph.fi/download/144754_Education_training_and_demand_for_labour_in_Finland_by_2025_2.pdf). The chapter 7 explains also the development needs in anticipation of skills.

The general workforce planning process covers all 28 industries, of which health care is one. The anticipation process of forecasting educational needs includes seven main phases, as shown in figure 1:

Figure 1: Main phases of the anticipation process in the Mitenna model |
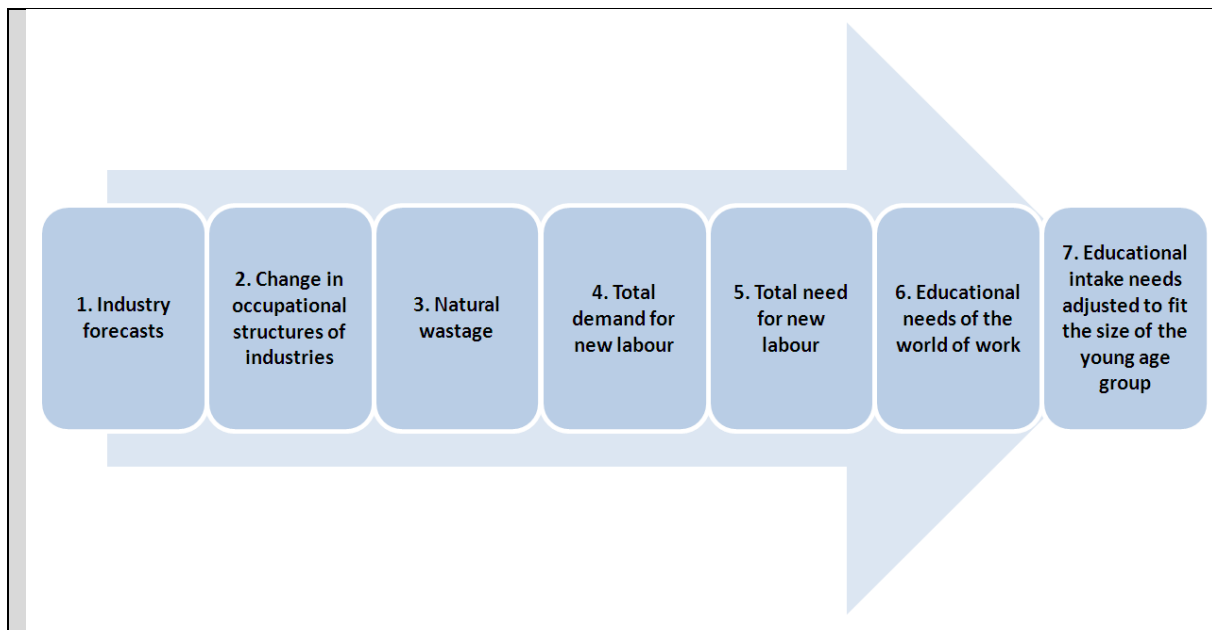
The Ministry of Education and Culture appoints also a wide group of experts to steer and provide expertise of the different industries for the phase of forecasting educational needs. These experts present e.g. the Ministry of Social Affairs and Health, Local Government Employers, trade unions, regional authorities and other stakeholders.

Regional councils have a statutory responsibility (Act 1651/2009) to coordinate the regional preparation of the long-term and medium-term forecasts for educational needs as part of the preparation of the development plan for education and university research.

Furthermore, according to the Health Care Act (1326/2010) the primary health care units in hospital districts have to ensure adequate human resources and the hospital districts within a catchment area for highly specialised medical care have to coordinate the demand for labour and supply of training with regional councils.

In addition, educational institutions implement regional projects on anticipation of skills needs.

Overview of the health workforce planning model

Anticipating workforce demand by means of the VATTAGE model and anticipating educational needs by means of the Mitenna calculation model are described in the OECD Health Working Papers, No. 62, 2013, p39.

During the latest workforce planning period VATT prepared two scenarios for employment trends in different industries by 2025. The basic scenario included a minimum number of targets or assumptions on political or other choices that might have an effect on the economy and employment. It was very much about repeating the observed economic development using the model and continuing the trend into the future. According to the basic scenario the employment rate is expected to end up at 72 %, with the GDP growth is leveling at 1,7 %. Considerable growth is expected in the GDP share and the workforce share of the social and health services. Conversely,

the target scenario's vision for the Finnish national economy turns the declining trend in the manufacturing industry back to an upward trajectory.

Based on the target scenario the Finnish economy is expected to perform better than based on the basic scenario. One of the presumptions is that demand for export will continue to increase also in the future. The GDP is expected to increase 2,3 % during the last years of the forecasting period, the employment rate is expected to rise to 75 % and the unemployment rate is expected to fall to 4 %.
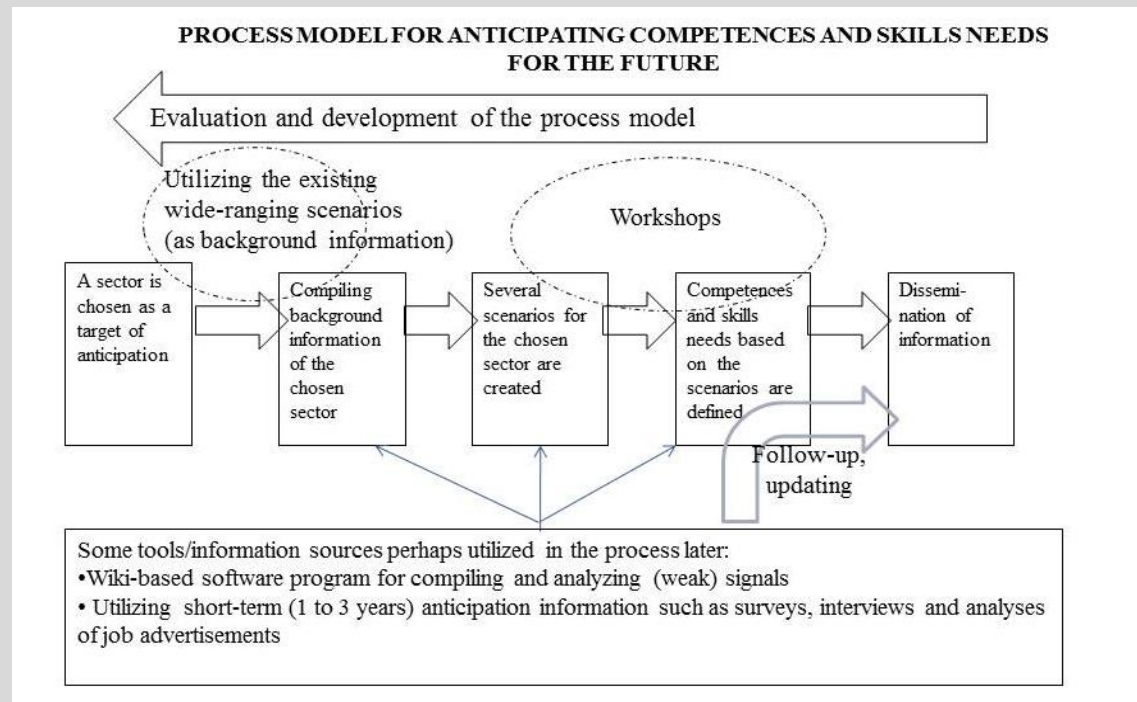
The need for social and health care services and the demand for social and health care workforce are expected to rise, but to a lower extent than in the basic scenario. (See (http://www.oph.fi/download/144754_Education_training_and_demand_for_labour_in_Finland_by_2025_2.pdf, pp28-33.) In addition, the third scenario "SOME scenario" regarding the health and social care services is based on expenditure projections by the Ministry of Social Affairs and Health. According to the SOME scenario the demand growth for health workforce is largely similar to that in the target scenario.

The FNBE carried out the National Project on Anticipation of Competences and Skills (VOSE) between 2008 and 2012. The project developed a process model for anticipating competences and skills needs (Figure 2). The aim was to produce anticipation data for use in development of the contents of vocational education and training (VET) and polytechnic and university education to meet the needs of the future world of work.

The VOSE anticipation model has been piloted in the following three sectors: child day care as well as child care and education and family welfare (Swedish-language pilot), real estate and construction, and tourism and catering services (Finnish-language pilots). (An English summary of the results is available at: (http://www.oph.fi/download/144508_VOSE_Results_2012.pdf).

After the VOSE project FNBE has carried on the anticipation of competences and skills needs as a permanent function of the agency. In the spring of 2013 FNBE has started anticipation processes on printing industry and on elderly care services. The third anticipation process of 2013 is going to be started in autumn.

2: *Process model for anticipating competences and skills needs.*

PROCESS MODEL FOR ANTICIPATING COMPETENCES AND SKILLS NEEDS
FOR THE FUTURE

Evaluation and development of the process model

Utilizing the existing
wide-ranging scenarios
(as background information)

Workshops

| A sector is chosen as a target of anticipation | Compiling background information of the chosen sector | Several scenarios for the chosen sector are created | Competences and skills needs based on the scenarios are defined | Dissemi-nation of information |

Follow-up, updating

Some tools/information sources perhaps utilized in the process later:
• Wiki-based software program for compiling and analyzing (weak) signals
• Utilizing short-term (1 to 3 years) anticipation information such as surveys, interviews and analyses of job advertisements

Qualitative data collection

Qualitative data collection:

1. Forecasting educational needs as part of the workforce planning process: As an example, the representatives of the Ministry of Social Affairs and Health use the following data based on reviewing health and social policy and research documents: changes in the health and social service needs and structure, health technologies, role of the clients and patients, as well as new trends on the redistribution of responsibilities, development of new roles and shortage and structure of the health workforce.

2. VOSE model: During and prior to the VOSE project the operational environment was analyzed in terms of the most important societal factors for change by means of qualitative content analysis of the research literature and weak signals and trends possibly having impact on the future development of the target area. Trendwiki used by the Ministry of Employment and the Economy was applied in this phase.

During the anticipation process, a group of experts representing the target area creates in the first work shop a list of the most important factors for change in terms of the future of the target area. Then the group of experts creates different scenarios (usually BAU, desirable, undesirable, surprising) by means of a method called "the future table". After creating the scenarios the group of experts divides the target area into subareas and/or professions and derives competences and

skills needs on the basis of the scenarios. Finally, the group of experts defines proposals for the development of education and training in the target area.

Stage in the planning process:
1. Forecasting educational needs as part of the workforce planning process: A wide group of experts appointed by the Ministry of Education and Culture provided assessments on the qualitative aspects of the world of work in terms of educational needs and educational intake needs.

2. VOSE project: as described above under *qualitative data collection*.

How the qualitative data is collected:
1. Forecasting educational needs as part of the workforce planning process: The representatives of the Ministry of Social Affairs and Health as members of the wide expert group appointed by the Ministry of Education and Culture reviewed health and social policy and research documents in order to identify changes and new trends from the perspective of the world of work regarding the issues described in the answer above under *qualitative data collection*. However, this phase of reviewing was not formally incorporated in the planning model.

2. VOSE project: as described above under *qualitative data collection*.

Who collects the qualitative data and who it is collected from:
a) Forecasting educational needs as part of the workforce planning process: As an example, the representatives of the Ministry of Social Affairs and Health review health and social policy and research documents.

b) VOSE model: During the preparation phase of the process either experts from the FNBE or an external organization, from which the background report on the factors for change in the operational environment of the target area was ordered. After the VOSE project, in addition to the literature reviews work groups of the FNBE experts on quantitative and qualitative anticipation have been utilized. The work groups used Trendwiki for collecting research data and data on societal factors for change and weak signals regarding the target area. In addition, the system of C&Q Profession was utilized for collecting data on the basis of the interviews on future competences and skills needs in different organizations.

Analysis of qualitative information
  – **How is qualitative information processed**
  – **Stages which use expert groups**

1. Forecasting educational needs as part of the workforce planning process: As an example, by means of group discussion by the wide group of experts appointed by the Ministry of Education and Culture.

2. The processing of qualitative information and stages which use expert groups for the VOSE model are described in the answers above.

A4.3) Germany

Overview of the health workforce planning process (series of actions taken)

In Germany, the healthcare system is characterized by self-governance of corporatist actors. Instead of one central, federal planning model, a variety of regulation mechanisms for different professions apply differently to hospital and to outpatient care in the states (*Länder*). Planning processes in Germany apply to distribution of seats for physicians practicing under statutory health insurance, medical school admission at universities (under control of the ministries for education, not the ministries of health), and specialist training.

88% of the German population is insured under statutory health insurance (*Gesetzliche Krankenversicherung*, GKV), making the sickness funds of the GKV the largest corporatist actors in medical self-governance (Rothgang et al. 2010). These sickness funds are public bodies, as are the national and regional associations of statutory health insurance physicians; whereas the Federal Association of Hospitals is a private association. All of these actors negotiate outpatient planning mechanisms for physicians and psychotherapists as part of the Federal Joint Committee (*Gemeinsamer Bundesausschuss*, GBA), where the German states are also represented. The planning guideline for these two health professions is called *Bedarfsplanungsrichtlinie* (literally: demand planning guideline), and has been revised in 2012/2013. The process of planning under this guideline is discussed in detail under planning model. It is important to note that the Bedarfsrichtlinie aims at distributing physicians in the country and ensuring sufficient access to outpatient care rather than guaranteeing a particular number of physicians.

Hospital capacity planning is organized and controlled by the individual states (*Länder*). The states create hospital plans, defining the number of hospitals and number of beds by specialties (Rothgang et al. 2010). Sickness funds are included in the hospital planning process but play a lesser role than in the outpatient care planning. Access to medical schools is regulated by one agency jointly set up by all states. The foundation for the allocation of study places (*Die Stiftung für Hochschulzulassung*, *hochschulstart.de*) controls the number of medical students (future physicians, dentists, psychologists) and pharmacy students, not, however, access to nursing education.

Overview of the health workforce planning model

Owing to medical self-governance and decentralized nature of the German healthcare system, there is not just one workforce planning model. As described above, outpatient and hospital care are planned by different corporatist and/or state actors in a self-regulatory system.

Under statutory health insurance, the *Bedarfsplanungsrichtlinie*, (demand planning guideline) determines a method to regulate access for physicians and psychotherapists to outpatient care. Please note that the following refers only to outpatient care delivered by statutory health care physicians.

The guideline clusters all the different specializations into 23 physician groups (e.g.GP, paediatricians, radiologists etc).

The 23 physician groups are divided into four categories for planning purposes:
- General physicians

- General specialist care (for example, ophthalmologists, pediatricians, OB/GYN, general surgeons, psychiatrists) (the psychotherapists, even though they are not physicians are included in the same planning category).
- Highly specialized specialist care (anesthesiologists, specialized internists, radiologists, child psychiatrists)
- Separate specialist care (for example, human geneticists, neurosurgeons, pathologists, nuclear medicine specialists, transfusion medicine specialists)

Each category is related to a specific type of planning region. Size and definition of planning region varies across the four different categories and are specified in the guidelines. Generally higher specialisations are associated with larger planning regions.

Ratio numbers are specified in the planning guideline for each group of physician, ranging from 1 GP per 1671 inhabitants to 1 transfusion medicine specialist per 1.322.452 inhabitants. These ratio numbers were originally derived normatively from the status quo of supply in 1990 and updated infrequently (see also ratio number modifications).
Based on these ratio numbers, regional over- and undersupply can be determined.

Determination of oversupply
If within a planning region the ratio of physician per inhabitants exceeds the target ratio number by 10 percent, oversupply is assumed. This leads to an immediate stop of any further admissions for physicians.

Determination of undersupply
If within a planning region the ratio of general physicians per inhabitants falls 25 percent below the target ratio, or the ratio of specialists per inhabitants falls 50 percent below the target ratio, undersupply is likely. In those cases several instruments are used to incentivize physicians to start practicing in those regions.

Altogether most regions and most physician groups oversupplied and the instruments of undersupply are only used in rural areas mostly for the group of GPs.

Ratio number modifications by demography are possible except for the groups of pediatricians and child psychiatrists. The demography factor is based on an age and a service use factor. To modify the ratio number, the number is multiplied by the demography factor. Generally speaking the demography factors ensures that regions with more old inhabitants have more doctors to serve the needs of the population.

In limited, special cases, regional exceptions to the targets specified in the guidelines are possible through the *Sonderbedarfsregelung* (extra needs regulation).

Regarding hospital planning; only hospitals included in a hospital plan at state level are able to get reimbursed for services under statutory health insurance. Hospital plans incorporate data on population, average stay at a hospital, frequency of inpatient care use and degree of use of hospital beds (Greß & Stegmüller 2011). Calculations of the Hill-Burton formula give information on demand of hospital beds by specialty and location. Thus, hospital planning in Germany can be characterized as capacity planning.

The Hill-Burton formula is derived as follows:

Need for beds = no. of inhabitants x frequency of hospital care use x duration of stay x 100 / 1000 x degree of use of beds x 365 days

Where frequency of hospital care use is, for one region, percentage of patients in hospital care per entire population of that region in one year, and degree of use of beds is, for one region, number of days of nursing services provided in relation to number of existing beds.

Qualitative data collection

As stated above, in the self-regulatory system in Germany, planning mechanisms vary between outpatient and hospital care, involving different actors. Thus, no central efforts to collect qualitative data exist.

During the yearly calculations to check for over- or undersupply in outpatient care provided by statutory health insurance physicians, a demography factor based on population age, sex and outpatient services use is applied. Thus, recent population aging is taken into account.

Research institutes and corporatist actors frequently use scenarios to project future supply and demand of health workforce (see for example Rothgang et al.2012, Afentakis & Maier 2010, both for nursing professions). These project-based projections may be used for planning purposes, but are not a regulated part of planning mechanisms in neither outpatient nor hospital-based care.

Analysis of qualitative information
- How is qualitative information processed
- Stages which use expert groups

Information on population age, sex and use of services is used yearly to potentially adjust physician per population ratio numbers in outpatient care under statutory health insurance. Demographic variables such as age and service use (derived from services financing data) are also used to adjust the number of needed beds in hospital plans.

Healthcare "expert groups" are responsible for planning so are always included in the (self-governed) planning process. There is no formalized staged of external expert elicitation.

References

Afentakis, A., & Maier, T. (2010). Projektionen des Personalbedarfs und -angebots in Pflegeberufen bis 2025. *Statistisches Bundesamt (Hg.): Wirtschaft und Statistik*, *11*, 990–1002.

Bedarfsplanungsrichtlinen (planning guidelines)

- Physicians and psychiatrists: http://www.g-ba.de/informationen/richtlinien/4/ (accessed 8 Oct. 2013)
- Dentists: http://www.g-ba.de/informationen/richtlinien/30/ (accessed 8 Oct. 2013)

Greß, S., & Stegmüller, K. (2011). *Gesundheitliche Versorgung in Stadt und Land – Ein Zukunftskonzept*. Wiesbaden: Friedrich-Ebert-Stiftung.

Rothgang, H., Cacace, M., Frisina, L., Grimmeisen, S., Schmid, A., & Wendt, C. (2010). *The State and Healthcare: Comparing OECD Countries*. London: Palgrave Macmillan.

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A4.4) Hungary

Overview of the health workforce planning process (series of actions taken)
Workforce planning is carried out at the national level, but without using a model. Current workforce planning corresponds to the process of defining the number of university places on the basis of labour market trends by the Secretariat of State responsible for Education, and the determination of medical residency places by the Secretariat of State responsible for Health of the Ministry of Human Resources. In the field of vocational training there aren't defined numbers – the number of trainees is highly affected by the training market conditions. Since 2011, each hospital estimates the number of new medical places based on the "real demand" (meaning their evaluation on the basis of health care utilisation they experience in their institution, without any scientific calculation or planning), and the number of new medical residency vacancies is made based on this estimation. Shortage professions are also determined yearly, and those who are willing to participate in specialist training in a shortage profession may get a financial support of 50% of his/her basic salary defined by law (if the institution where he/she is employed applies for it). Mobility trends are also closely monitored by collecting data and establishing indicators, also by following motivation trends in mobility, and this information can also be used as an input for determining university places and shortage professions, which at this stage does not happen systematically or on the basis of an algorithm .
All the above mentioned processes are paving the way for a "real" HWF planning, which was not necessary in the past decades, but now, as circumstances changed, health policy makers see the relevance of this activity. The need of establishing a HWF planning model in Hungary has already been recognized by health policy, and adequate and continuous political and financial support and a systematic, formal process in HWFP & forecasting is needed in order to make this happen. As the first step HWF monitoring system has been established by legislation in order to have valid data and up-to-date registry, the implementation of which is now under development (hopefully it will be in function from Summer 2014). Other initiatives are ongoing that focus on the possibility to build a formal HWF planning model in the near future. Among these is also a new legislation on a reporting system, which will make compulsory for health providers to report all the qualified staff (this could provide data for reporting "practicing" HWF to the JQ – plan for legislation, December 2013). So the current aim of Hungary is to match the ongoing projects/current initiatives concerning HWF data (Human Resources for Health Monitoring System, National Health Resources Project, HRH Clearing House Pilot Project, Graduates Tracking System, Human Resources for Health Observatory, Career paths), and to elaborate a model/process for planning and forecasting purposes.
The planning process would require involving several stakeholders with strong cooperation and lively networking. Regarding data sets: data collection/data clearing, eliminating duplications is needed. Cooperation of stakeholders is already working partly formally, partly informally, but comprehensive formal, regulated and transparent agreement is needed among stakeholders of government and its background institutions (National Institute for Quality- and Organizational Development in Healthcare and Medicines, Office of Health Authorization and Administrative Procedures), universities, employers, and the relevant NGOs in the long run.
Actors in the process of HWF monitoring and future planning:
EEKH – Office of Health Authorization and Administrative Procedures for monitoring and in the future the proposed task/responsibility will be the HWF planning

EMMI – Ministry of Human Resources for establishing planning model/system/process and the determination of training capacities on the basis of this procedure – ongoing
GYEMSZI – National Institute for Quality- and Organizational Development in Healthcare and Medicines
Expert group with the participation of Semmelweis University

Overview of the health workforce planning model

We do not have a model yet. We are thinking about establishing a supply-based model first.
We also have tools which can be incorporated into our planning model, for example Semmelweis University uses a program for scenario generation, which is a good basis for comparison of different theoretical outcomes.

Qualitative data collection

We can say, that in this preparatory phase it is taken into account and mapped, but not collected systematically for planning purposes.
As we do not have a planning model, this type of data is not collected for planning purposes.
There are ongoing initiatives which can be channelled into the future forecasting model when it will be established. The Semmelweis University Health Services Management Training Centre has been conducting relating research activities and studies, with the use of questionnaires, semi-structured interviews and focus groups, the results and findings of which have not been systematically and consistently used as inputs in HWF planning processes yet. Such an initiative for example the continuous questionnaire based research on the intention of medical students in the first and sixth year of university and doctors participating in specialist training to go abroad with exploring the force-field behind the intention. It is very important to be part of the future forecasting, as an indication for mobility which is a decisive factor in our country when thinking of planning future workforce numbers. The Hungarian Alliance of Medical Resident Doctors also conducts surveys in this regard, while study on migration intention and its influencing factors is also available regarding nurses.
We are also organising policy dialogues with stakeholders and policy makers, which is a good platform to collect such type of information and where national and international best practices can be taken into account. Expert and stakeholder opinion can be channelled in this way into policy decisions. Interviews are also part of getting informed, but is not meant as systematically collecting qualitative data. In case of studies semi-structured interviews are used with the aim of collecting information systematically, however this data collection is also not part of a planning process.
When thinking of a future model it is of course most probable, that first a supply side model will be established based on quantitative information. However we are now in a situation to consider whether further tools, more sophisticated procedures used by Member States participating in the Joint Action are relevant and feasible in our case. As mentioned in point 2 we have tools available which can be incorporated in the model, but it would be nice to be built in the model/process of planning in the way that it can estimate realistic scenarios, the establishment of which is the most difficult and means already a demand or needs based, qualitative planning aspect. It would mean however that we would not start with the most basic model, which has of course a lot of benefits - learning from the experiences from other Member States already more developed in planning - but also many risks which have to be considered in advance..
We are of the opinion, that interviews with stakeholders on a regular basis will definitely be conducted, and if possible (human and financial resources are always the question), information will be grouped and translated into quantitative information to be able to use it in the model.

Expert and focus groups have to be established or existing ones used as source of information, and as test-groups for evaluating policy options planned. The ongoing initiative to run a National HRH/ HWF Observatory at the Semmelweis University HSMTC can also be a good platform for this qualitative data collection, as its aim is to serve as a HRH knowledge centre and to provide platform to and facilitate professional discussion among stakeholders, obviously including qualitative data and information, and also to synthetize and to channel the results into planning and other HWF relating policy actions.

We are of the opinion that at the brainstorming phase most probably qualitative data will be collected from stakeholders, policy makers, experts in the form of interviews, policy dialogues on how to establish HWF planning in Hungary. It will of course continue in the phase of setting up the model. The question is, whether in the model, as written above, will it be possible to build in a regular collection and translation of qualitative information, and if yes, which type and how.

It is most probable that in the evaluation of the model after having set up, and later on continuously, experts and stakeholders will be involved in evaluation.

For the time being, as mentioned above, the methodology consists of policy dialogue, interview, focus group, questionnaires. There was a policy dialogue in May 2013 in the frame of a collaboration with WHO on establishing a National HRH Observatory about Hungarian HWF situation, also having international examples of planning on the agenda. In order to be able to involve stakeholders, a stakeholder analysis is the first step.

Analysis of qualitative information
- How is qualitative information processed
- Stages which use expert groups

We do not have clear methodology and expertise for this kind of analysis at the present stage. This is one of the possible benefits the Joint Action can give us. A systematic, comprehensive and transparent methodology is needed in order to effectively translate and channel findings and results into relevant health policy actions.

A4.5) Netherlands

Overview of the health workforce planning process (series of actions taken)

The Advisory Committee on Medical Manpower Planning (ACMMP) was established in 1999 on instigation of the national government by the 3 major health care stakeholders: the universities/ training institutes, the health insurance companies, and the professionals. Periodically, the ACMMP releases advices to government regarding the desired intake level for various official recognized medical and dental specialization courses. Government, in its role as a complete subsidizer for these training programmes, decides on the advices within one year and adapts the advices one year later after making financial arrangements with the universities/ training institutes. Simultaneously, recommendations are made concerning the intake level believed necessary for medical schools and dental schools.

The professions included are:
- 27 clinical specialisms, 3 primary care specialisms, and 3 social medicine specialisms. Besides these, the Netherlands at present also legally recognizes 10 so-called "profile physicians", which are functioning in between specialists and medical graduates;
- Clinical chemistry, clinical physiology, and clinical pharmacy;
- Dentists, dental surgeons, orthodontists, and oral hygienists;
- Psychotherapists, mental health psychologists, (clinical) neuropsychologists, and nurse specialists in mental health.

The advices are based on the anticipated <u>healthcare demand</u> in 12 to 18 years. In order to have a sound projection the ACMMP uses experts, research, and data on every available subject, including for example demographic change, epidemiological change, socio-cultural change, policy changes, unmet demand, vocational change, efficiency change, labour time change, horizontal substitution, and vertical substitution. When evidence is sufficient, we will use a single point value. If not (most of the time) experts will have to agree upon a most likely and a least likely value. These values are combined into 9 different scenarios.

Based on a vast amount of data on the <u>healthcare supply</u> side, we can calculate the corresponding intake levels for each profession. The ACMMP will choose the two most likely scenarios and offer the corresponding intake levels to government. This leaves the final call about the intake level with the government. It also depicts the levels of uncertainty for each profession and it is an indication for government about the margins that are thought wise by the major stakeholders in health care. In the recommendations 2008 and 2010 the major scenario uncertainties were about the implementation of vertical substitution. Although government advocated vertical substitution and significantly raised intake numbers for the training to become a nurse specialist (nurse practitioner in most MSs) or a physician assistant, they also used the (high intake) scenarios for clinical specialists without significant impact by vertical substitution.

Overview of the health workforce planning model

Basically, the model was implemented in an Excel spreadsheet which has become more sophisticated in time but which has not been changed. A diagram of this model is shown below.
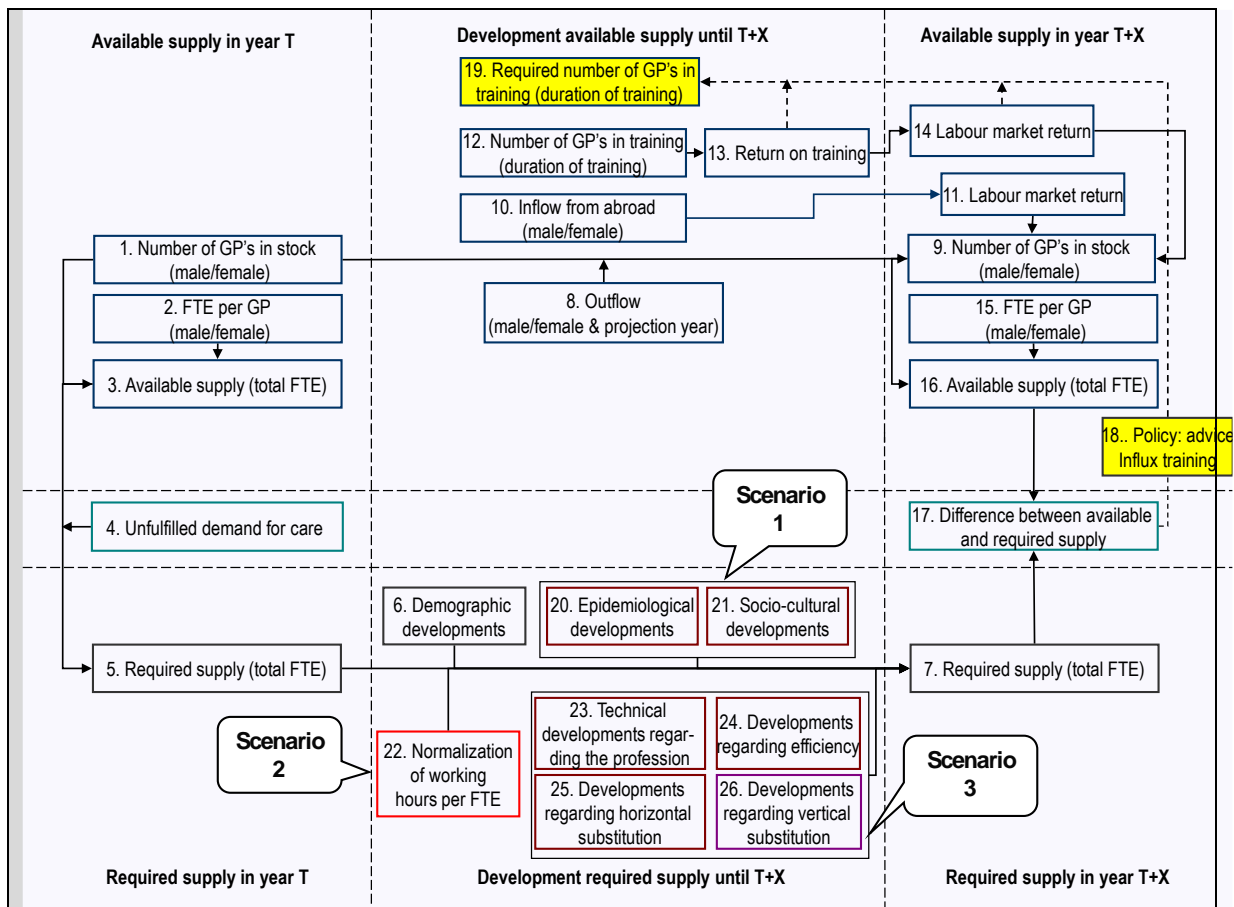
The modelling starts out with the number of self-reported fte by each profession, which after adjusting for unmet/ excess demand is taken as the actual demand for health care. This demand is then projected to our future in 12 to 18 years, with all kinds of parameters mingled in 9 different projections. This leads to 9 different projected demands for the future in 12 to 18 years. Next, the supply present in 12 to 18 years originating from the present supply, the present trainees and the immigration is estimated. The difference between the projected demand and the projected supply is the gap that has to be bridged by training. The intake numbers are calculated for each profession.

For data on the demand projections, we use utilisation data from the Dutch Hospital Data association, the data organisation from the health insurers Vektis, data from the Central Bureau of Statistics, the National Institute for Health and the Environment, NIVEL, KIWA Carity, and epidemiological research by institutes, universities, research groups, professionals, and consumer panels. This mostly concerns demographic or epidemiologic data. Socio-cultural changes include policy changes, which can origin from government, health insurance companies, universities/ teaching institutes, or professionals and their scientific organisations.

For data on the supply projections, we use data from the Royal Dutch Medical Association, the Registration for Individual Health Professionals, membership of professional organisations, Tax data and professional Pension Funds, and surveys on instigation of ourselves or others.

For data on the working process, we confront the experts with studies on efficiency, vocational developments, working hours, consulting times, horizontal and vertical substitution, not patient related activities.

As of 1999, we also put into place a system dynamics model which allows us to confront experts instantaneously with the impact of certain changes.

Qualitative data collection

Qualitative data collection:
Three to four times a year, each of our 5 Chambers and 3 focus groups meets to discuss the latest research, data, policies/ politics, and vocational developments. We decide on what data we are missing and where research can answer our questions and where experts can. Besides these structural meetings, there are also invited expert meetings and sometimes expert counselling to provide us with intelligence and counterintelligence. The ACMMP personnel takes field trips and has meetings with professionals, members of the boards, researchers, and government to have as much knowledge about the past and the present as possible.

Stage in the planning process:
Qualitative data collecting is an ongoing process. We collect these data permanently. Once every two or three years, the data are "frozen" at values every member in the Chamber agrees upon. According to sensitivity analyses of our models, vertical substitution is one of the most powerful parameters in the model. Unfortunately, this parameter lacks sufficient quantitative data for most (medical) professions. Qualitative data are paramount for this parameter.

How the qualitative data is collected:
Qualitative data are collected in several ways. The most obvious way is by collecting literature with quantitative data and scrutinizing/ analysing these for consistency. Next, we separate the parameters with reliable quantitative data from the rest. We will discuss the parameters with lacking quantitative data (almost always the epidemiological and socio-cultural parameters plus working process parameters like vertical substitution and labour time changes) with experts in different ways. Interviewing them separately, discussing in Delphi-like settings, meetings in our Chambers, and electronic group decision rooms, workshops, depending on the preferences of the group. The experts are from all three parties: insurance companies, universities/ hospitals, and the professionals. They have to reach consensus.

Next we will build scenarios and use the parameters. Normally, nine different scenarios can be compared. Experts will comment on the likelihood of the scenarios and make a final choice of two scenarios with the corresponding influx of medical trainees. These scenarios are presented to our board and after finalization sent to the ministry and to the field parties.

Currently, we are experimenting with a system dynamics model that can give visual feedback instantaneously about the effects of slight changes in parameters.

Collection of qualitative data:
There are particular experts identified to provide qualitative data. Identifying occurs by literature on forecasting, by colleague experts, by authority, by government, by research desks and by

universities. We have consulted experts on this field for the separate professions and for intermingling of professions.

Analysis of qualitative information
– How is qualitative information processed
– Stages which use expert groups

These experts, different for each profession, are used in the stage of sampling the qualitative data and in the stage of reaching consensus on the extremes in the range of these data.

A4.6) Spain

Overview of the health workforce planning process (series of actions taken)

In Spain, the highest political responsibility for health workforce (HWF) planning lies on the Human Resources Commission of the National Health System (CRHSNS) involving 18 public health services and the Ministries of Health, Education, Defense and Finance.

The Ministry of Health, Social Services and Equality (MSSSI) coordinates the HWF planning activities at the state level and makes proposals to the CRHSNS. The MSSSI has an advisory body, the National Council of Specialties in Health Sciences (CNECS), composed of more than 500 representatives from all health professional specialties (doctors, pharmacists, nurses, for example).

The CNECS assists in the HWF planning through different ways, informing about the annual supply of residence positions at the NHS for specialization of health professionals and developing the training programs of specialties in accordance with scientific and technological developments and patients' needs of healthcare attention.

Our experience in HWF planning is mainly based on specialist medical doctors. We have used a model based on supply and demand and the estimation of future needs through the application of a system dynamics model (workforce modelling).
The model defines a single scenario (scenario generation and horizon scanning) based on which the projection of specialty supply and demand for a 15-year horizon is obtained. According to the results, MSSSI and CRHSNS adopt the political decisions (policy analysis), which can range from the distribution of residence positions for medical specialties, to requiring the Ministry of Education to modify the offer of degree places or until the legislation amending.

1. Supply model
This model takes into account the following variables:
• *Numerus clausus* in the faculties of Medicine and number of graduates in Medicine
• Number of specialists in the NHS, including the rate of feminization, territorial distribution, recirculation and the abandonment of the specialty practice.
• Migration
• Unemployment rate
• Retirement
• Mortality rate
• Duration of training in each specialty.

2. Demand model
It is composed of the following variables:
• Demographics of Spanish population: Birth and mortality rates, aging, migration.
• Impact of scientific and technological advances
• Professional competencies
• Changes in organization and/or structure of the health system
• Economic and financial resources
• Demands noticed by the health services of the Autonomous Communities(regional health services)
• Trends in demand defined through a non-structured interview to panel of experts.

Overview of the health workforce planning model

The simulation model starts with the design of the theoretical model and its relationships of causality which seeks to represent the most relevant aspects and determinants of the real system. Once the variables and the relationship between them (current and future) have been specified, the scenario (base model) is generated from which both projections, supply and demand of professionals within 5, 10 and 15 years, are established. This is how two models, supply and demand, are configured for every one of the medical specialties.

The base model being used currently is constructed for each of the medical
specialties according to the following scenario:
• Number of specialized training places: average number of places available for each specialty in the period 2006-2010.
• Demand increase, based on the opinion of expert group, composed of professionals from the Ministry of Health, Autonomous Communities and medical specialists
• Number of places in the Faculties of Medicine: 7000 per year
• Number of specialists by gender and specialty. This figure is based on estimations from data provided by various sources. At a nearly date, there will be more precise data from the State Register of Healthcare Professionals

Model results (outputs) offer the following data for the next 15 years:
• Number of specialists (headcount)
• Ratio of specialists per 100,000 population
• Percentage of professionals older than 49 years.
• Demand of medical specialists (headcount).
• Difference between supply and demand classifying each of the specialties under one of the following categories:

	Difference between supply and demand (%)
Moderate deficit	Less than -10
Mild deficit	Between -10 y -5
Balance	Between -5 y + 5
Mild surplus	Between 5 y 10
Moderate surplus	More than 10

Qualitative data collection

Qualitative data collection:
At 2008, a survey to a Group of Experts took place, with focus on the trend of demand for medical specialists until 2025.
Participants in this group of experts were:
- Subgroup of more than 20 experts in HWF planning, catalogue of health services, health plans and health statistics, that work in the Ministry of Health
- Subgroup of experts in HWF planning and management from 11 autonomous communities.

- 43 medical specialists from clinical care practice, representing each of the existing medical specialties.

Each of the respondents was asked to weight the trend in demand for every one of the medical specialties in the 2009-2025 period. The obtained outcome was having the demand of medical specialties classified into the following categories:
1. Crescent
2. Crescent-stable
3. Stable
4. Declining

In order to quantify these trends into the model, the annual and accumulated growth rates published in a study with a similar methodology were used: "Physician Supply and Demand: Projections to 2020. U.S. Department of Health and Human Services Health Resources and Services Administration. Bureau of Health Proffesions. October 2006"

Stage in the planning process:
Qualitative data has been collected at the base model stage definition (scenario generation).

How the qualitative data is collected:
A survey of a group of experts was conducted.

Collection of qualitative data:
The information and data analysis was performed by the staff of the MSSSI.

Analysis of qualitative information
- **How is qualitative information processed?**
- **Stages which use expert groups**

As it has been mentioned above, the results of qualitative data have been incorporated into the demand model. The weighting of the results is established as follows:

	Rate of increase in demand for medical specialists by year (%)	Cumulative rate (2008-2025) of increase in demand for medical specialists (%)
Specialties with crescent demand	1.30	24.50
Specialties with crescent- stable demand	0.60	10.70
Specialties with stable Demand	0	0
Specialties with declining demand	-0.60	-9.70

Three groups of experts were involved in the methodology used:
- Experts in healthcare planning at the central level (HWF, services, healthcare plans and health statistics)
- Experts in HWF planning from 11 regions
- Medical specialists from 43 specialties of clinical practice

A4.7) United Kingdom

Each of the four countries of the United Kingdom has, since 1999, had devolved responsibility for their health systems (and this includes health workforce planning and forecasting). As a result the responses in this section are under the headings of each of the four countries of the United Kingdom: England, Northern Ireland, Scotland and Wales.
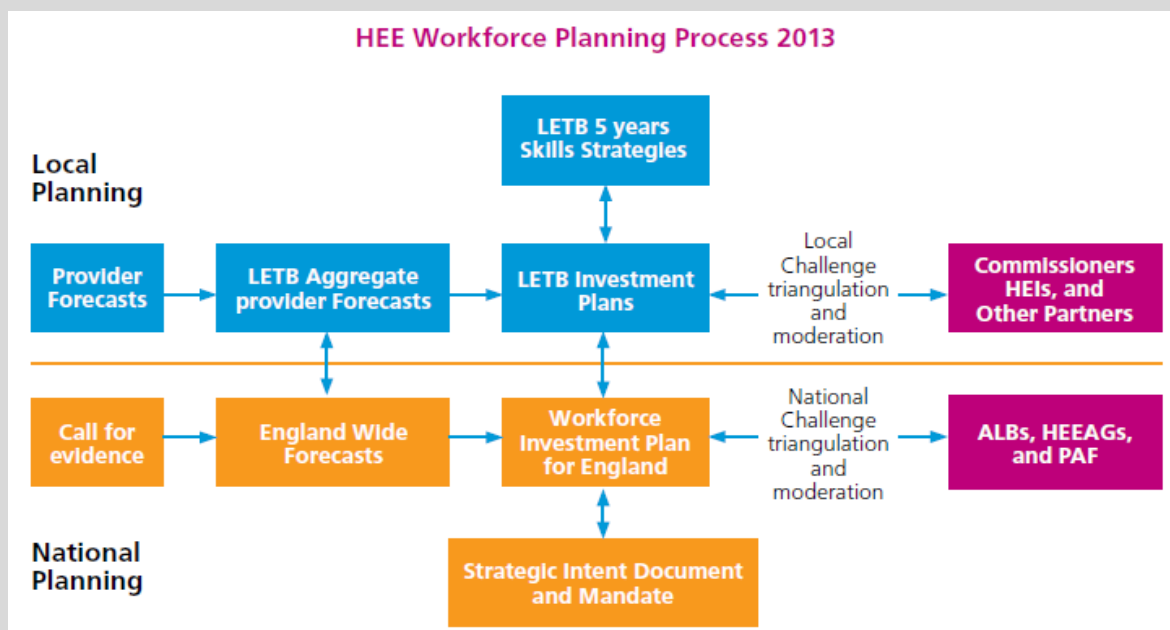
Overview of the health workforce planning process (series of actions taken)
England
The Department of Health acts as the steward for the health, social care and public health system by setting strategic outcomes, securing resources, setting the regulatory, policy and legal frameworks and providing oversight and leadership (Department of Health, 2012). The Department of Health sets strategic objectives around workforce planning, health education and training and development in *The Mandate to Health Education England* (Department of Health, 2014). Health Education England ensures 'that the future workforce has the right numbers, skills, values and behaviours' and annually sets out its commissioning intentions in the *Workforce Plan for England* which is subsequently used as the basis of the contracts that each Local Education and Training Board (LETB) places with local education providers for that academic year (Health Education England, 2014). To inform these training commissions Health Education England take the five year plans from LETBs, who in turn have taken five year projections from NHS projections from NHS providers. For approximately 110 workforce roles HEE then decides on whether to increase or decrease training commissions based on triangulation of the local planning forecasts with the national planning forecasts (as shown in the diagram below). *Figure 1: Health Education England workforce planning process 2013*   The CfWI is a key contributor to the planning of future workforce requirements for health, public health and social care in England. The CfWI is commissioned by the Department of Health, as well

as Health Education England and Public Health England, to look at specific workforce groups and pathways, and to provide materials, tools and resources to inform workforce planning policy decisions at a national and local level such as those relating to the in-scope Joint Action professions (see, for example, CfWI, 2013).

Having clarified the statutory relationship between the Department of Health and Health Education England and explained the position of the CfWI as an independent organisation working on specific projects on their behalf, the remainder of this response refers to the 'Robust Workforce Planning Framework' (CfWI, 2014a and illustrated in Figure 2) which is used by the CfWI to conduct workforce planning and forecasting.

Figure 2: Robust workforce planning framework (CFWI, 2014a)

Northern Ireland

In Northern Ireland, the responsibility for regional workforce planning for health workforce planning across Health and Social Care (HSC) is undertaken by the Department for Health, Social Services and Public Safety, in conjunction with the six Health and Social Care Trusts and the Health and Social Care Board (HSCB) – the commissioner. The Department recognises the importance of workforce planning in identifying appropriate staffing levels and structures. Local staffing arrangements are the responsibility of individual HSC employers, taking into account factors such as service needs and available resources. The Department has a role in ensuring that sufficient suitably qualified staff are available to meet the needs of the service overall. The Human Resources Directorate has in place a programme of comprehensive workforce planning reviews carried out at regional level across the main professions and a number of supporting groups in the HSC.

The main aims of the reviews are to establish information on the supply/demand dynamics relevant to the workforce group, thereby informing the Department's decision-making on the number of

training places to be commissioned and to develop understanding of the issues impacting on the recruitment, retention and career progression of those employed.

The workforce planning cycle comprises a major review of each group periodically, supported by annual update reviews. The purpose of the annual update reviews is to maintain current workforce information and identify any new issues impacting on the workforce group thereby enabling any necessary action to be taken at an early stage.

Scotland

NHS Scotland has an overall structure of:

- 14 regional NHS Boards which are responsible for the protection and the improvement of their population's health and for the delivery of frontline healthcare services
- Seven Special NHS Boards and one public health body who support the regional NHS Boards by providing a range of important specialist and national services

For workforce planning, The National Workforce Planning Guidance – CEL 32(2011) available at http://www.sehd.scot.nhs.uk/mels/CEL2011_32.pdf – was issued as a national guide to support an evidence-based framework for workforce planning. It is designed to support and assist those responsible for leading on workforce planning, in particular the development of workforce plans at service, NHS Board and regional level.

Scotland has a single healthcare system where NHS Boards manage all services in their Board area. The workforce planning process begins with the Local Delivery Plans due in March each year which describe the staffing capacity and capability requirements for the delivery of national targets.

Detailed NHS Board Workforce Projections for one and three years are submitted to the Scottish Government at the end of June each year. The template is issued to Boards in March each year. A primary function of this is to plan the Nursing and Midwifery Intake numbers with education. In the case of Nursing and Midwifery workforce projections, the Board Nurse Director should have professional oversight of the numbers and endorse these as part of the NHS Board Workforce Plan. NHS Boards should also provide details of the workload/workforce planning tools used (where available) in the planning of their nursing and midwifery workforce.

NHS Boards' Workforce Plan Narratives are published each August, these are required to be signed off by local Area Partnership Forums and Staff Governance Committees.

Wales
NHS Wales (seven Health Boards and three Trusts) currently undertakes an integrated medium term planning cycle (3 years) of which workforce planning is a core element. This planning cycle uses an adaptation of Skill for Health's six-stage workforce planning process and provides predominantly qualitative information of the current and future workforce. This is for the whole workforce and covers acute, community and primary care services. The six-steps model is supported by the Workforce Configuration Tool, which collects quantitative workforce data.

Overview of the health workforce planning model

England

A description of the system dynamics model comes from the one used by the CfWI to quantify the future supply and demand of doctors as part of a project for the Department of Health to inform a Health and Education National Strategic Exchange review of the intake to medical and dental school is provided in the CfWI's *Technical paper No. 3* (CfWI, 2014b). The diagrams below show a high-level stock and flow diagram containing the key training and workforce stocks that make up the medical workforce model and the generic demand structure implemented in the medical model.
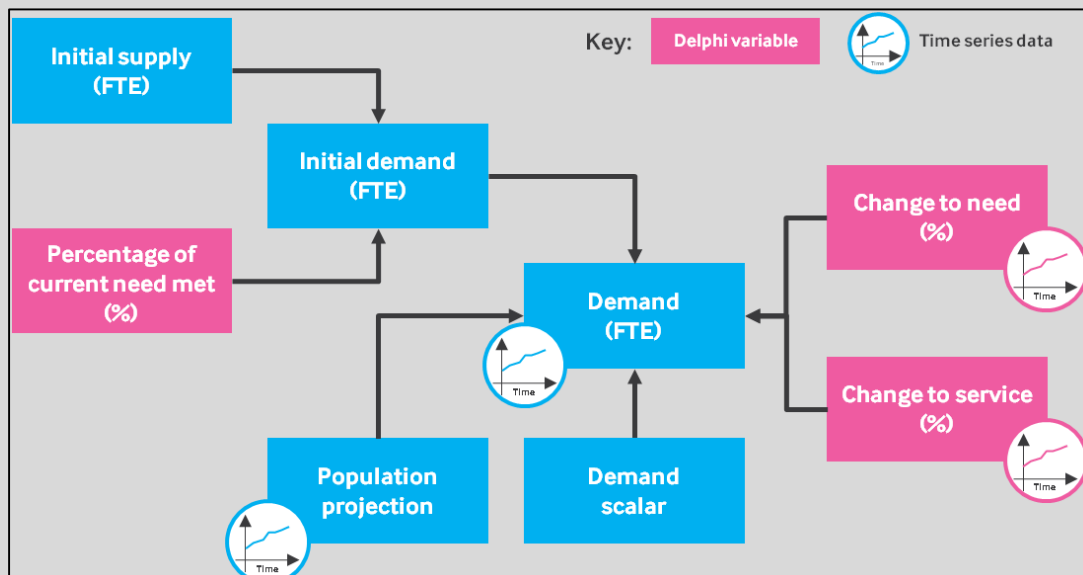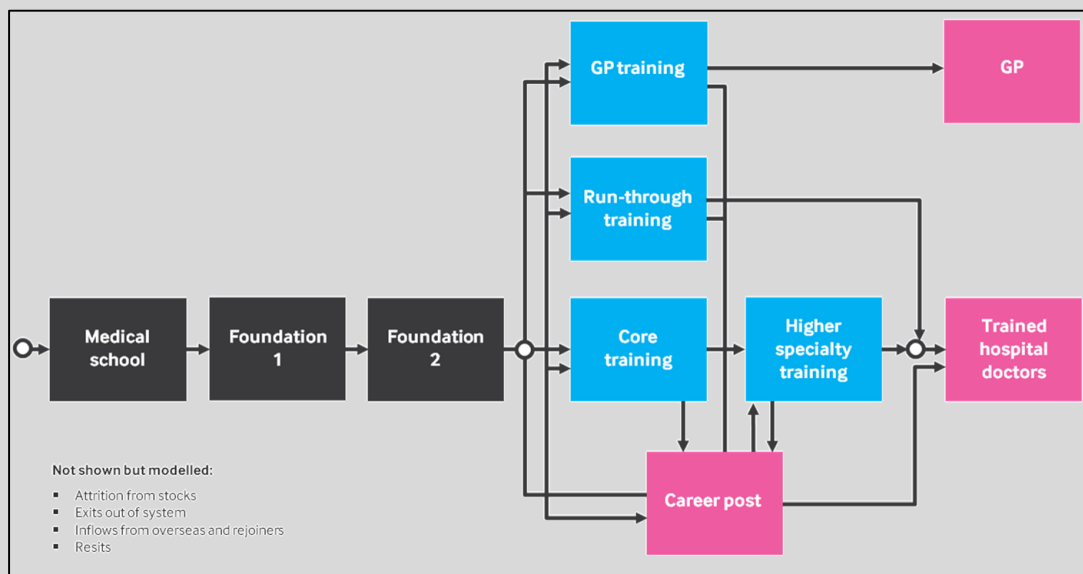
Northern Ireland

In Northern Ireland the model used is the 6-step model for workforce planning. The methodology involves the use of Advisory Groups to help inform the process. These advisory group members

comprise key stakeholders from the profession under review, education providers, trade union representatives, departmental officials and HSC Trust HR professionals and representatives from the HSCB.

Quantitative data is provided form Departmental statisticians, drawn from the HSC payroll system and validated by advisory group members. Qualitative data is also used drawn from Advisory group members and templates issued to HSC organisations.

<u>Scotland</u>
The six-step Workforce Planning Methodology is used as the main tool, this offers initial assessment of supply and demand. Further augmentation of this model is offered by a Tiered Model of assessing information; Demographics, & epidemiology – informs service model and service demand – informs workforce requirements – informs education needs.

The 5x5 Risk Matrix – which assesses risk by scoring the likelihood of a risk occurring and the impact this could have on service provision, the two scores are then multiplied to give a scoring for each risk, the higher the score the greater the risk to service provision – is also increasingly used by Board Workforce Planners, this enables the application of a consistent approach to workforce risk assessment, once this is fully utilised across NHSS it will allow for improved national aggregation of risk. The assessment of risk crosses capacity and capability and therefore quantitative and qualitative information.

The Nursing and Midwifery Workload and Workload Planning Tools are applied across a range of environments, and will be mandated in April 2014. Central to workforce planning is uniting capacity and capability intelligence as these core elements are inextricably linked to provide more robust intelligence

<u>Wales</u>
NHS Wales currently uses a version of the Skills for Health Six Step methodology, which has been adapted for use in Wales. The steps look at the Strategic Environment, the current workforce, the future workforce, the education development and commissioning required to achieve the future workforce, the plan to achieve the future workforce and the engagement with other partners such as Social Services.

This methodology is a means, predominantly of gathering the qualitative information required for workforce planning. A workforce tool is used to gather the quantitative workforce data to support the qualitative information within the plans. Bothe the qualitative and quantitative information taken from the organisational plans are utilised to extract information on future education commissioning and educational development needs for NHS Wales.
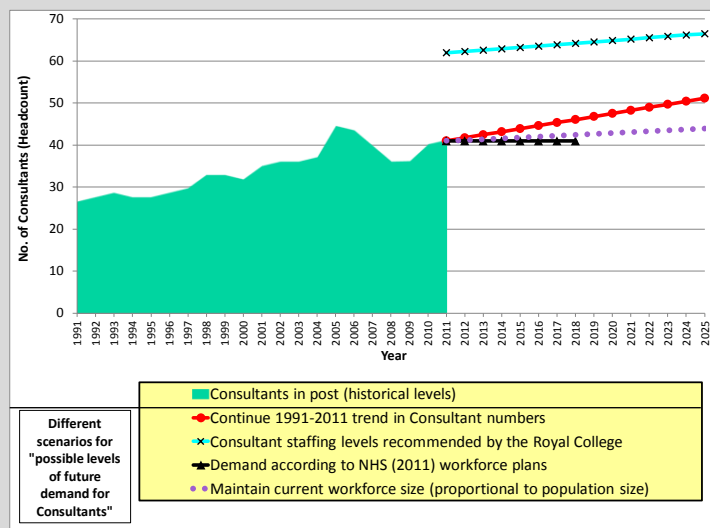
An extended model is used for forecasting supply and demand for medical and dental staff:
- This uses stock-flow models developed within NHS Wales to forecast the future supply of CCT-holders, dentists, Core Trainees and Foundation Doctors, and compare it against a range of demand scenarios (e.g. staffing forecasts created by Local Health Boards/Trusts,
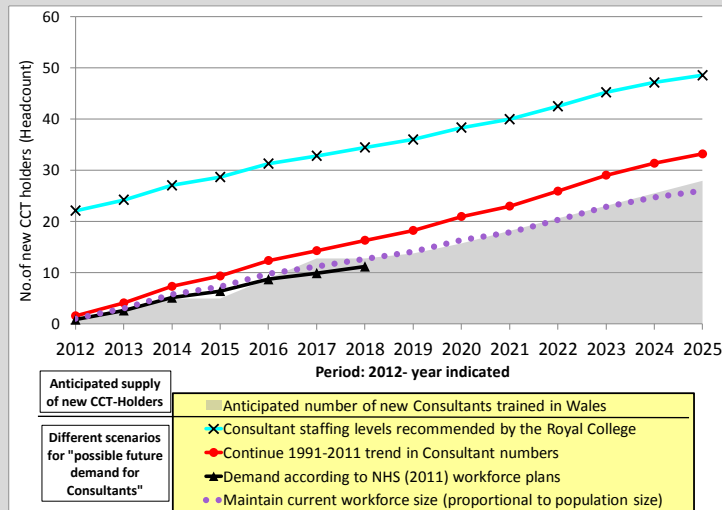
continuing historical growth trends, meeting staffing guidelines set by various Royal Colleges).

- Most of the modelling work undertaken relates to forecasting the supply/demand for CCT-holders. The model built to do this allows different variables to be adjusted (e.g. duration of specialty training, consultant retirement age, consultant vacancies, attrition from training, migration of new CCT-holders into/out of Wales etc) and graphically shows the effect of this change on Wales' anticipated supply/demand for CCT-holders.

- The data and assumptions used in the models are validated by a range of stakeholder groups and networks (e.g. Royal Colleges, Deanery, specialty-specific networks). Specialty-specific forecasts are then produced comparing Wales' future supply for CCT-holders against the various demand scenarios.

- The model produces two main graphs, examples of which are given below:

1) Illustration of different scenarios for Wales' future demand for consultants in specialty X

Different scenarios for "possible levels of future demand for Consultants"

- Consultants in post (historical levels)
- Continue 1991-2011 trend in Consultant numbers
- Consultant staffing levels recommended by the Royal College
- Demand according to NHS (2011) workforce plans
- Maintain current workforce size (proportional to population size)

2) Comparing Wales' anticipated supply of newly-trained consultants against the number needed to meet each of those demand scenarios

Chart showing "No. of new CCT holders (Headcount)" over the period 2012 to 2025 (Period: 2012- year indicated).

Anticipated supply of new CCT-Holders

Different scenarios for "possible future demand for Consultants"

Legend:
- Anticipated number of new Consultants trained in Wales
- Consultant staffing levels recommended by the Royal College
- Continue 1991-2011 trend in Consultant numbers
- Demand according to NHS (2011) workforce plans
- Maintain current workforce size (proportional to population size)

Qualitative data collection

England

With reference to the CfWI's robust workforce planning framework, the following data collection methods are used:

Horizon scanning – semi-structured one-to-one or telephone horizon scanning interviews are conducted with experts and stakeholders, identified because of their expertise on the workforce in question. Representatives are sought from different perspectives and from organisations involved in the commissioning, standard setting and regulation of the profession or specialty, as well as practising professionals and service users.

Scenario generation – facilitated workshops are used to generate scenarios and Delphi processes are used to quantify scenario variables.

Workforce modelling – for example, the model is validated with stakeholders.

Northern Ireland

A range of different types of qualitative data is used based on the professional group under review. Where the workforce is mainly based in the statutory sector, templates are issued to each HSC Trust with 'prompt questions' under a range of themes, such as recruitment and retention issues , future service planning and future workforce development.

Where the workforce is non-statutory in the main it is much more difficult to access robust information however stakeholder interviews are conducted and anecdotal evidence gleaned where possible.

Focus groups can also be used as appropriate.

The advisory group convened under each review provide an excellent source of information in respect of front-line working.

Stage in the planning process:

Steps 1-4 of the six-step process. Usually collection of the qualitative data follows compilation of the quantitative data so that comparison can be made between the statistical information and the anecdotal evidence.

How the qualitative data is collected:

Methods used in the past include: Templates, telephone and paper surveys, face to face interviews with Key contacts in the profession such Chief Nursing Officer and Nursing workforce leads, as an example, advisory group meetings.

Collection of qualitative data:

Stakeholders are identified because of their expertise on the workforce in question. Representatives are sought from different perspectives and from the organisation involved in commissioning, standard setting, and regulation of the profession or specialty, as well as practising professional and on occasion, students.

Scotland
Within The National Workforce Planning Guidance CEL32 (2011) there are a number of the stages which require qualitative information to inform workforce requirements. Consultation with staff needs to be demonstrated within Boards as part of the NHSScotland Staff Governance Standard and the final workforce planning narrative.

In assessing workforce requirements it should be noted that it is difficult to separate the qualitative from the quantitative as skill availability impacts on workforce numbers and vice versa.
The Tiered Model necessitates the qualitative debate takes place to inform the education models.

The qualitative information is collected in a range of formats across NHSScotland. We have some small islands so in this instance information and detail will be locally known, in larger Boards a range of consultative models consistent with the Staff Governance Model will be applied.

These conversations enable the debate to examine both capacity and capability.

Stage in the planning process:

Information is collected throughout the year. NHSS has a National Workforce Planning Forum were workforce planners from each Board are represented; this promotes engagement and qualitative discussions in an ongoing basis. The forum has three workstreams:
- Information and intelligence
- Modelling and Profiling
- Workforce Planning Education

The application of CEL32 also promotions conversations within Boards throughout the year.

How the qualitative data is collected:

The information is collected in different formats within Boards as described above, and will be reflected in their workforce narrative

Collection of qualitative data:

The collection of qualitative data or information is dependent on the work, and the information could come from a range of sources such as specialist projects, NHSScotland Board workforce planning leads, Local redesign projects and Regional developments.

<u>Wales</u>
There is an all Wales formal structure to discuss the workforce – Strategic Education Development Group (SEDG) which looks at strategic workforce issues including workforce planning and education commissioning requirements and to ensure that there is wide and comprehensive engagement with the service with regards to the future educational requirements of the workforce. This group is supported by a number of strategic sub groups to ensure that the requirements of the whole workforce are considered. Changes to the arrangements for SEDG have recently been announced by the Minister for H&SS.

The Welsh Government and NHS Wales also has a formal structure of meetings with different professional groups, trade unions and others where workforce issues, linked to service and scientific/technical developments are discussed and flagged up between professional groups and the service. Again, these arrangements are currently under review.

These are the main current mechanisms for the discussion of qualitative workforce information.

The WEDS team also has its own network of individuals and groups (particularly in relation to medical & dental staff) which it uses to validate information and planning assumptions (e.g. Royal Colleges, clinical directors within NHS Health Boards/Trusts, Deanery leads).

Qualitative information and data is collected as part of the workforce planning cycle. Organisations capture this information typically during the Autumn and submit at the end of the financial year. The Welsh Government is currently reviewing the planning cycle and is about to introduce a fully integrated planning cycle across service, finance and workforce. This will tie the workforce planning cycle within the overall planning cycle for NHS Wales by 2014/15.

The WEDS team also collects qualitative data throughout the year via discussions with its more informal network of stakeholders.

Qualitative workforce information is collected via the workforce planning cycle and from discussions with the professional bodies via the above mentioned formal meetings structure. It is

also collected via other meetings structures and the WEDS central team undertaking specific analyses on an ad hoc basis.

Apart from via the workforce planning templates, qualitative information is also collected by the Professional bodies and Wales-level networks (identified by asking stakeholder views on who best represents a particular specialty/staff group/service etc).

There are a number of recognised groups who provide advice to Welsh Government (e.g. Wales Scientific Advisory Group, Wales Therapies Advisory Group, Welsh Medical Committee, National Pathology Programme Board)

Analysis of qualitative information
- How is qualitative information processed?
- Stages which use expert groups

England
Horizon scanning interview data is collated and used to feedback to participants at the scenario generation stage. Following scenario generation experts are invited to participate in a Delphi process which is used to quantify key workforce variables. These quantitative judgements are shared over two rounds to refine the variables.

Stakeholders and experts are used throughout the robust workforce planning framework, for example in the qualitative understanding of quantitative data, to validate assumptions, as well as at the defined stages of stakeholder and expert involvement in horizon scanning and scenario generation, as described above.

Northern Ireland
Qualitative data is themed and shared with Advisory Group members to allow sharing of best practice between HSC organisations and to stimulate and encourage debate between organisational representatives who may have opposing perspectives at times. This helps to provide a 360 degree view of the workforce. The Advisory Group members are also helpful in challenging the assumptions underpinning scenario generation.

The expert groups would be the Advisory groups as described previously. They are identified at the outset of the project and each project has a different set of stakeholders.

Scotland
The use of the data very much depends on the reason for collection or the purpose of examining it. Workforce intelligence is constantly examined and assessed at local, regional and national level but it is not formally described as analysis. There are no formal tools other than the 5x5 Risk Matrix and Nursing & Midwifery Tools described above.

Professional judgement and experience describe the main application and different pieces of work use expert groups to bring context and specialist intelligence to specific pieces of work such as Emergency Medicine and Unscheduled care.

Wales

WEDS has analysed qualitative data to verify changes in student numbers for a number of professions (PESTLE analysis using multiple qualitative data sources).

Work has commenced to produce workforce summaries for certain non-medical groups and WEDS intends to explore the use of scenario-generation methodologies

Discussions with clinicians and other stakeholders are used to validate data/assumptions used in WEDS' medical workforce summaries and consultant supply/demand forecasts. Due to Wales' size, this typically involves a small number of stakeholder groups for each specialty. Consensus on issues such as what values to use for modelling assumptions are therefore typically reached organically, rather than using specific methodology.

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