|  |  |
| --- | --- |
| **WP5 Deliverable**  **D.051** | JA logo |
|  | |

|  |  |  |
| --- | --- | --- |
| **Version/Status** | **Last updated** | **Owner** |
| Draft 01 | 2013.11.04 | Italian Team |
| Draft 02 | 2013.11.08 | Italian Team – integrations |
| Draft 02 | 2013.11.18 | With Partners’ comments and notes |
| Draft 03 | 2013.11.30 | Italian Team |

**Index**

[1. Management summary 2](#_Toc373683924)

[2. Introduction to the concept of minimum data set (MDS) 3](#_Toc373683925)

[3. The HWF planning conceptual model 4](#_Toc373683926)

[4. The planning process 6](#_Toc373683927)

[4.1 HWF planning minimum purposes 7](#_Toc373683928)

[5. The (quantitative) forecasting model 8](#_Toc373683929)

[5.1 Supply side 9](#_Toc373683930)

[5.2 Demand side: a basic quantitative forecasting model 10](#_Toc373683931)

[6. Minimum Data Set definitions and requirements 13](#_Toc373683933)

[6.1 Some basic principles 13](#_Toc373683934)

[6.2 What is a minimum data set? 13](#_Toc373683935)

[6.3 The elements of the minimum data set 14](#_Toc373683936)

[7. Key planning indicators 15](#_Toc373683937)

[8. Minimum data set 19](#_Toc373683939)

[9. Appendices 20](#_Toc373683940)

[9.1 Appendix n 1. Some basic concepts for the indicators concerning the HWF demand 20](#_Toc373683941)

[9.2 Appendix n.2 - Definition of each indicator 22](#_Toc373683943)

[9.2.1 Coverage of future demand, high level 22](#_Toc373683944)

[9.2.2 Relative Affordability 23](#_Toc373683945)

[9.2.3 Coverage of future demand, detailed 24](#_Toc373683946)

[9.2.4 Coverage of needs by foreign professionals today and in the future 25](#_Toc373683947)

[9.2.5 N° of professionals per inhabitant today and in the future 25](#_Toc373683948)

[9.2.6 N° of professionals per weighted inhabitant today and in the future 25](#_Toc373683949)

[9.3 Appendix n.3 – Two examples of calculation for the indicator 1 26](#_Toc373683950)

[9.3.1 Example a The indicator 1 (Physicians) with the demand calculated on the base of the future health consumption 26](#_Toc373683951)

[9.3.2 Example 2 b The indicator 1 (Physicians) with the demand calculated on the base of the future weighted population 28](#_Toc373683952)

[9.4 Appendix n.4 - Minority opinions 31](#_Toc373683953)

[9.5 Appendix n.5 – Glossary 32](#_Toc373683954)

[9.6 Appendix n. 6 - Table of references 34](#_Toc373684032)

[9.7 Appendix n. 7 – WP5 general description 37](#_Toc373684033)

[9.7.1 WP5 scope 37](#_Toc373684034)

[9.7.2 WP5 actions 37](#_Toc373684035)

[9.7.3 WP5 team members 37](#_Toc373684036)

[9.8 Appendix n. 8 – WP5 workshop minutes – Milan 19th – 20th of September 2013 41](#_Toc373684037)

|  |
| --- |
| **MINIMUM DATA SET** |

# Management summary

The healthcare sector constitutes one of the most significant sectors in the EU economy with a growing employment potential due to an increasing demand for healthcare that is driven by several factors such as morbidity, specifically those linked to ageing population, innovative technologies, population expectation in the health systems, among other[[1]](#footnote-1).

However, the healthcare sector faces major challenges:

* an ageing workforce and lack of recruitment in replacing retirees;
* significant employee turnover in some sectors due to demanding working conditions and relatively low pay;
* the need for the workforce to develop new skills to adapt to potential in order to deal with innovative technologies and with the rise in chronic conditions and comordities[[2]](#footnote-2).

Facing these challenges it requests from the policy maker courageous decisions based on a sound forecast of the future impact of any policy put in place. At EU level, an action plan for EU health workforce has been adopted in 2012. One of the actions prioritised in the European Commission’s action plan for EU health workforce (HWF)[[3]](#footnote-3) is improving health workforce planning and forecasting to develop policy interventions and inform investment decisions to better match supply and demand and support European countries with health workforce planning which varies considerably[[4]](#footnote-4). The planning process needs a good set of data in order to produce reliable results. Improving health workforce planning and forecasting goes through the identification of a set of key indicators and a process of measurement through the collection of the proper related data.

Reporting shows that some countries still struggle to put a standard and reliable data collection in place, which is the first step for any forecasting exercise. Currently there is no agreement at the international level on minimum data requirements for health workforce planning[[5]](#footnote-5).

The **Joint Action on Health Workforce Planning and Forecasting (JAEUHWF),** funded under the 2012 Health Programme, intends to create a European platform to share good practice and to develop methodologies on forecasting health workforce and skills needs[[6]](#footnote-6). The workforce in focus corresponds to the five “harmonised” professions: Physicians, Nurses, Midwives, Pharmacists, Dentists[[7]](#footnote-7).One of the objectives of the Joint Action is to identify a Minimum Data Set for Health Workforce Planning.

A Minimum Data Set (MDS) for Health Workforce Planning consists in a core set of standard variables used to build indicators, which are collected, generally, at a national level, for the reporting and assessment on key aspects of health system delivery. In this paper the focus lays on the current workforce/staffing resources and future Health workforce needs. This can enable the comprehensive analysis of supply, requirements and adequacy in professional-based workforce planning.[[8]](#footnote-8)

**This document contains the results of a shared process involving thirty-seven EU partners of the Joint Action EUHWF (European member states as well as stakeholder organisations)[[9]](#footnote-9).**

**These results are a consensus recommendation on the key planning indicators and the related minimum set of data[[10]](#footnote-10), that may be adopted by the EU Member States as a common necessary tool kit to provide basic forecasting and enable a basic planning process to take place[[11]](#footnote-11).**

**A future release of this paper will address the recommendations for the necessary data set and indicators needed to draw future enhanced scenarios. This next release is planned for a second Joint Action programme after 2016.**

# Introduction to the concept of minimum data set (MDS)

In the various European countries health systems differ significantly. Even the use of HWF, both as a whole and a single group of professionals, varies widely. In comparing the European Countries it is surprising to see the stability over time of the differences between them[[12]](#footnote-12), depending on traditions, on the organisation of the health and on social security system. The new Member States (MS), which have acceded into the European Union during the last fifteen years, increase the disparity of traditions and organisations.

The planning of human resources in health must takes into account these differences and respect the autonomy of each MS. On the other hand, the free movement of workers within the EU requires the consideration, in dealing with HWF planning, of the EU market as a unique system with common elements in each MS.

The Feasibility Study on EU level collaboration on forecasting need, workforce planning and health workforce trends[[13]](#footnote-13) pointed out:

*"****A significant problem driver in this respect is the lack of a sense of cohesive purpose behind data collection****. Data on human resources for health are collected for various purposes; but only in a very limited number of countries data are collected for health workforce planning. Hence, certain indicators, which are crucial to forecast and carry out an effective planning of resources, are not covered by data collection. As a consequence, many of the data available at national level are also not integrated and used in health workforce planning."*

It is thus necessary to identify a set of key indicators that are instrumental to health workforce planning by defining a conceptual model (meta model).

Accordingly, the first hypothesis is that, despite the differences, a common minimal data set (MDS) can be established and adopted by all MSs, enabling to development of common practices and the exchange of meaningful data and reports.

# The HWF planning conceptual model

The conceptual model contains all the relevant elements of a health workforce **planning system**[[14]](#footnote-14). Below the items of the planning system.

* **The objectives of the HWF planning system (set of outcome indicators)**. *The objective of the planning system is really the final meaning of the whole project. In literature are cited for example "balance between need and supply" for a profession. This balance can also be required on a regional basis. It is also possible that the objectives include restraints (i.e. budget limitations) which mean that the system also has to find an economical balance. It seems that the process of definition of the objectives is one of the main means to interest stakeholders like policy makers. It is very important to state if the objectives also include indicators and how they are defined.*[[15]](#footnote-15)
* **The measure of benefits of HWF planning** The whole planning process is activated in order to reach the overall goals defined in the previous point (objectives). OECD (2013) points out that very few health workforce planning models have been formally evaluated. Many criteria con be used to assess the quality and impact of health workforce planning models, but probably the main ones are their actual use in policy decision-making and their accuracy in helping to achieve their main objective of ensuring a proper balance over time between the supply and demand of different categories of health workers.
* **Any National or regional legislation influencing or regulating the HWF planning**. As the planning system is a public process it could be a legislation that governs the process and the roles of the different stakeholders.
* **Actors and organization of the HWF planning**. The planning is a process which involves human beings as representatives of stakeholders engaged. So it is important to understand the roles of each actor, who is responsible for the global planning and who is taking the different decisions.
* **The resources for planning (any human, technical or economic resources)**. The planning process will need human resources. It is important to face this question by a Country that intends to govern a planning process.
* **The model of forecasting / simulation**. It is important to define the model of forecasting / simulation used. This step will condition the following steps (set reference values, and determine actions for reaching the reference values). In the OECD HWF planning review (2013) one of the key recommendations is that the supply-side need to focus more on retirement patterns. It is pointed out that there is a need to consider more closely the complex issue of work-to-retirement patterns, particularly for physicians but also for other professions as a large number of health care providers are approaching the "standard" retirement age and their retirement decisions will have a major impact on supply in the coming years. It is also put in evidence the need to address adequately the geographical distribution of health workers. A proper assessment of gaps between supply and demand needs to go below the national level to assess geographical (mal-) distribution of physicians, nurses and other health professionals and how it might evolve over time under different conditions.
* **A set of reference values (targets for the planning process)**. The reference values (targets) are the specific values of the indicators (drivers) of the forecasting model, in coherence with the objectives of the whole planning system. The reference values are to be compared with the results of the forecasting in order to identify the actions needed to fulfil the objectives of the planning.
* **The decision on key forecasting elements (time horizon, frequency)**. The time horizon should permit the planning system to adjust to the desired situation. It is important to perform the forecasting on a regular basis in order to permit subsequent adjustments.
* **The actions for reaching the reference values**. The comparison between the probable future situation and the desired future situation makes it necessary to identify correcting actions to reach the desired situation.

It is possible to find all or some of these elements in every HWF planning system developed in specific Country. So, it is possible to use this conceptual model to map the different HWF in each Country.[[16]](#footnote-16)

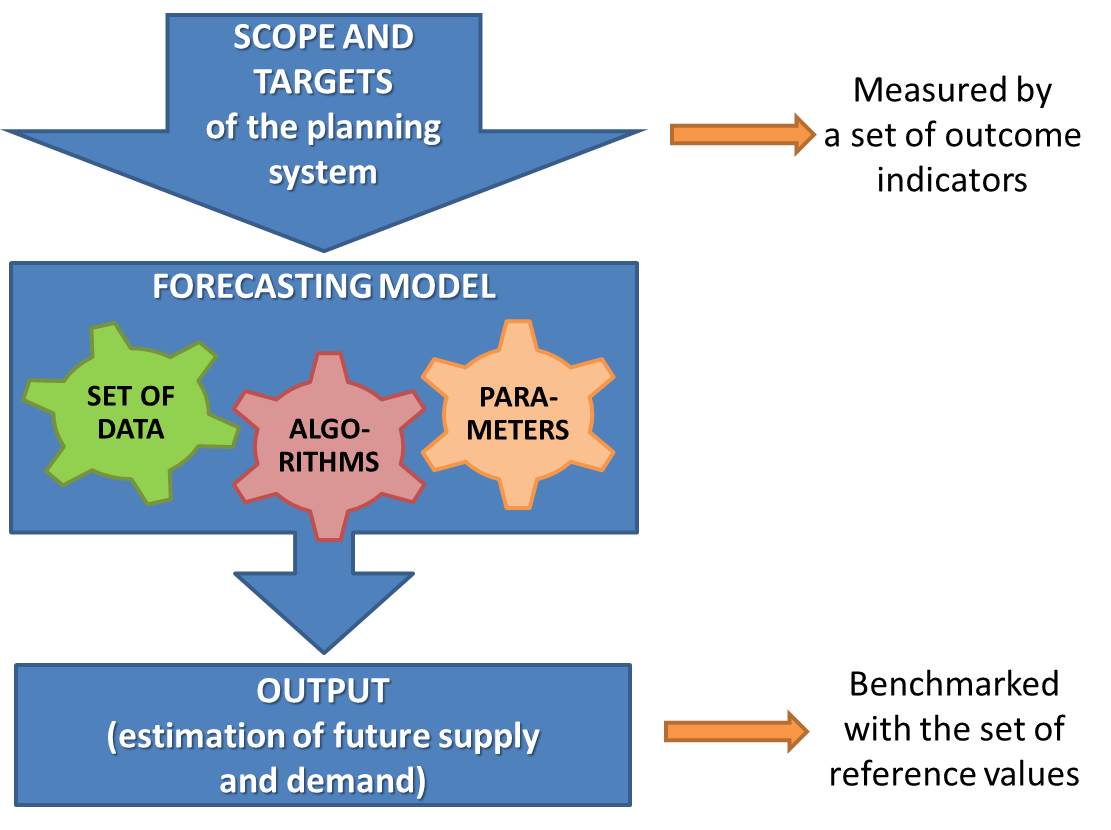
This conceptual model is important as it stresses the need to focus on the **decisions** that will be taken (by policy makers) as a result of the programming. It also puts the data collection and the forecasting methods in a setting composed of **planners, stakeholders** and **experts.**

The conceptual model distinguishes between the **planning process**[[17]](#footnote-17), which produces a policy proposal, and the **forecasting model**[[18]](#footnote-18), as part of the planning process, which will produce the data necessary for formulating the policy proposal.

Based on this conceptual model it is possible to identify a HWF minimum purpose of planning.

# The planning process

The HWF planning process is the set of organized activities, task lists and schedules required to achieve scope and targets defined in the health workforce planning system. It includes the making and maintenance of a plan and it combines forecasting of developments with the preparation of scenarios on how to react them (strategies). The planning process necessary to offer decision-makers a technically motivated set of opinions of probable situations in the future (forecasting) can be described by the following figure.



***Fig. 1: Elements of the planning process***

The process of planning works if the forecasting model is based on precise targets, with good knowledge of the error factor on these targets and on the model reliability:

"***Health workforce planning is not an exact science and needs regular updating:*** *Assessing the future supply and demand for doctors, nurses or other health professionals 10 or 15 years down the road is a very complicated task, fraught with uncertainties on the supply side and even more so on the demand side. Projections are inevitably based on a set of assumptions about the future; these assumptions need to be regularly re-assessed in light of changing circumstances, new data, and the effect of new policies and programs.*"[[19]](#footnote-19)

The output is expressed (measured) by the indicators defined by the planning process. The forecasting model is composed by a set of data as input, a certain number of scenarios based parameters and algorithms. The necessary set of data (the first wheel in the previous figure) depends on the targets and on the indicators. The scope and the targets of planning are the beginning of the forecasting model and need to be considered.

The Work Package 5 (WP5), as part of the Joint Action EUHWF, has defined the Scope and Targets, the key planning indicators and the set of data that is *necessary and sufficient* for a **basic forecasting model**, thought of as a starting point for the Countries that need to develop a planning process of Health Work Force.

## HWF planning minimum purposes

To identify the key planning indicators of a basic forecasting model we need, first of all, to define the scope and, subsequently, to set the targets (HWF planning minimum purposes).

The WP5 partners and experts, introducing a priority scheme with the objectives and targets that are necessary to include in a basic planning process, agreed that **the scope is**:

* **to recognise the major imbalances of HWF,**
* **to analyse these imbalances,**
* **to identify possible solutions.** [[20]](#footnote-20)

This scope was split into three stages as follows:

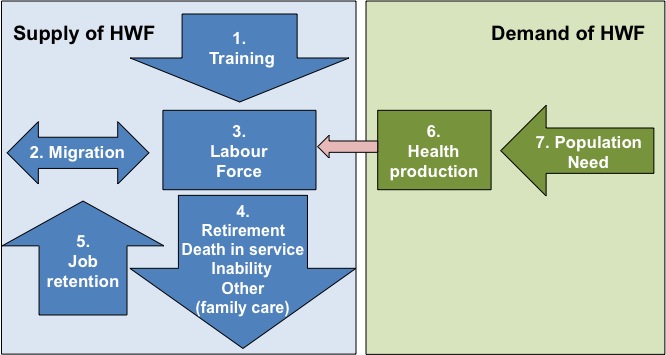
| **Release** | **Definition & Targets** |
| --- | --- |
| **MDS release 1A** | Must allow to assess the current situation and to identify imbalances vs. overall evaluation of the supply and the demand for healthcare |
| **MDS release 1B** | Must allow to evaluate the impact of basic action to correct those imbalances.  Basic actions are defined by actions on:   * health production; * inflow (training and immigration) * outflow (retirement and emigration)   Evaluation is defined through:   * + major cost aspects of HWF;   + a first evaluation on impact of imbalances on quality;   + monitoring overall coverage and geographical variances;   + identification if domestic production meets the needs; |
| **MDS release 2** | Must allow scenario based forecasting including changes in the health care system.  This is considered as an advanced model and is not included in the Minimum Data Set, though it will be discussed as a perspective of next action in the sustainability work package.  Special attention has to be set within the evaluation indicators to the non-healthcare related impacts as major Healthcare determinants are to be found outside of the healthcare context. Health workforce planning is a perfect example of Health in All policies concept. |

On the base of the information that could be included in a forecasting model, a set of key planning indicators has been defined by the WP5 in order to monitor each of the above-mentioned targets (both stage 1a and stage 1b). Consequently, a list of data, that were *necessary and sufficient* (minimum), was selected in order to create those indicators.

# The (quantitative) forecasting model

The scope of a quantitative forecasting model is to estimate future scenario as a function of past and current data (time series, cross-sectional or longitudinal data) on the base of specific assumptions. Accordingly it is appropriate when past and current data are available.[[21]](#footnote-21) However, it is important to emphasize that, although the forecasting model presented below has a quantitative basis (the indicators proposed in the following pages require the collection of time series of quantitative data), it is clear that the estimates of future quantitative values also depend on judgments and opinions of experts and stakeholders (qualitative forecasting).

The forecasting model here proposed contains seven categories of data belonging to two areas: **supply** of HWF and **demand** of HWF (see figure below).



***Fig. 2: 7 data categories for the HWF quantitative forecasting model [[22]](#footnote-22)***

To influence policy decisions, forecasting models must be credible. The assumptions underlying different models have a strong influence on results. Transparency of methods and assumptions is a prerequisite for model quality, as is a strategy to validate results[[23]](#footnote-23).

## Supply side

* **Training** (item 1) is the number of new professionals produced each year by educational institutions. We suggest, as a basic estimation, to forecast the first years based on the number of students currently within the education system and the following years as the average of the first years. Most of the existing forecasting models are built on the assumptions that the number of trained professionals is the main parameter to create balance between demand and supply of HWF...
* The size of the actual **Labour force** (item 3) depends mainly on the capacity to identify the professionals that are not directly employed in the system but that are actually producing health care, for example retired but still active on a private payment basis. An assumption might be that the numbers professionals not directly employed but active in producing healthcare will be stable over time. In this case they will not influence the changes in supply.
* **Migration** (item 2) has a different importance according to the weight that this phenomenon has in each country. Anyhow its impact on forecasting model will probably grow in the future with more integration within the EU...[[24]](#footnote-24)
* **Retirement** (item 4) depends on individual decisions and on the legislation that governs the right to retirement. The assumption of the legislation can be part of the parameters that will be shared with the policy makers as the size of the labour force is very sensible to this parameter[[25]](#footnote-25).
* **Job** retention (item 5) might be more closely linked to some professions (i.e. nurses) than for others. Its importance changes in the different EU Member States depending also on the habit to early retirement for family reasons. This item can be shared with the policy makers as a parameter in their hands.

On the base of what is stated above, the items on the supply side can be considered stable or can be shared with the policy makers as political decisions to be done.

## Demand side: a basic quantitative forecasting model

Concerning the demand side, there are numerous studies which analyze the wide range of factors influencing the demand of healthcare.

The Health conditions including the disability will depend on [[26]](#footnote-26):

* The socio demographic factors like age distribution and education
* The geographic and environmental factors
* The cultural factors like social norms, behaviour and self efficacy
* The economic factors like income and wealth

The technology is an significant factor for diagnosis and cure of diseases and the technological development may have an important role for the demand of health care services.

The actions from the authorities like health promotion and policy decisions will also influence the demand for health care services and thus for the change in demand of the health workforce.

Unlike the elements relating to the supply side, the many factors that determine the HWF demand are more difficult to measure and therefore to predict (see appendix 1). The aim of this paper is to identify the minimum data set for a basic quantitative forecasting model. Considering that the projection period useful for our basic model will be variable with a maximum of fifteen years for the physicians and taking into account that in this medium period the past trends will be significant for the result, the actual consumption for each age group will represent a good assumption for a basic model. Anyhow, as the institutions and the policies may be an important part of the model, it is necessary to discuss this assumption with the policy makers and not only present the results as facts.

The proposed conceptual model includes all these factors in two categories of data: population needs and health production. Then, the WP 5 partners and experts, in the framework of the Joint Action EUHWF, accordingly to the recent OECD and EC studies and guidelines[[27]](#footnote-27), proposed to use a simplified basic model that permits to calculate the demand of HWF on the base of:

* population by group of age;
* health consumption (per age group);
* and a parameter “k” which transforms the population demand in HWF demand (number of professionals needed in headcount).

In order to complete the definition the forecasting model, a number of basic assumptions, valid also for more advanced model, have to be made.

* Health consumption per capita for each age group remains constant (no compression or expansion of morbidity).
* The percentage of public consumption and private consumption will remain constant so the total health consumption (HCT) will include also the private consumption.
* Health service remains as it is: no change in productivity or technology.
* The roles or the scope of practice for each profession remain unchanged (no interaction between 5 different professional groups)
* Current imbalances between supply and demand.

On the base of these assumptions and in the framework of a “minimum purposes of planning” these are the proposals for the two categories of the demand side model.

**Population need (item 7)**

* The trend of future demand will be estimated on the base of the demographic change. It can be assumed that the service prevision does not change over time and the needed growth/reduction in health workforce is equal to the growth in demand based on demographic structure of population. The inflation is not taken into account. For simplicity, we will base on age and disaggregate into three groups: children (Pop1), adults (Pop2) and elderly (Pop3). These groups have to be further defined: children can be in the 0-14 age interval, adult in the 15-64 age interval and elderly in the 65+ interval. The model proposed measures of the pro-capita healthcare consumption (HC) for each age group in year 0 (HC10, HC20 and HC30)and calculate the future healthcare consumption by multiplying the future population in year x (Pop1x, Pop2x and Pop3x) by proportions of healthcare consumption in year 0:

Here’s the formula: HCTx = ( HC10\*Pop1x + HC20\*Pop2x + HC30 \*Pop3x)

The need of health workers for **health production (item 6)**

* The EC measures the health expenditure by age and is also publishing the forecast of the population by age group[[28]](#footnote-28). The formula recommended by the WP5 partners and for the calculation of the future need is expressed below:

**HWFpx=kp \*HCTx**

where **HCTx = ( HC10\*Pop1x + HC20\*Pop2x + HC30 \*Pop3x)**

Each group of profession has a specific ratio to the health expenditure (kp). For example in the Italian case, more than 20% of the total public health expenditure is for physicians and close to 40% is for all the professions included in this project[[29]](#footnote-29). Any change in expenditure will therefore be closely related to the cost of and the numbers of the professionals working in the health care sector.

**Other changes in the assumptions of the demand side model**

* Simplification of the demand side model:
  + As a result of the discussion with the policy makers and the stake holders it might be questioned that the increasing age of the population will also increase the demand for health services (see appendix 1). In this case we can assume HC1=HC2=HC3=1 (every single individual demand absorbs the same level of health care consumption). This simplified model will estimate the demand only by the changes in population size; an approach commonly known as a **constant health workers to population ratio approach**.
  + An alternative way to calculate the future need of health personnel is to use the health consumption per age group (HC1, HC2, HC3) for calculating a weight per age group and then calculate a weighted population (see appendix 3) today and tomorrow. It is important to point out that even if the measure used in this case (weighted population) is not expressed in money terms like in the main proposal above, it is based on exactly the same assumptions (health consumption in money terms per age group).
* Extension of the demand side model:
  + Productivity improvement: this can be expressed as a reduction of " kp " by a certain percentage (you need less health workforce per total health consumption).[[30]](#footnote-30)

# Minimum Data Set definitions and requirements

A Minimum Data Set (MDS) for Health Workforce Planning consists in a core set of standard variables used to build indicators, which are collected, generally, at a national level, for the reporting and assessment on key aspects of health system delivery. It may be adopted by the EU Member States as a common necessary tool kit to provide basic forecasting and enable a basic planning process to take place.

## Some basic principles

The Minimum Data Set presented in this document is based on some basic planning requirements.

|  |
| --- |
| 1. **Universal coverage**, i.e. the health care system will provide assistance to all citizens without excluding poor or rich that means it means that the forecast for the need of professionals includes the needs of the whole population of the Country. |
| 1. **Affordability**, i.e. the cost of the future health care system has to be kept within the limits of what is considered sustainable by the population. |
| 1. **Effectiveness**, i.e. in considering the future need of professionals is it important to bear in mind good production parameters. |
| 1. **Imbalances are not an option** as they are a threat to the coverage and quality, i.e. it is not acceptable to plan for a number of professionals that is lower than that which ensures a good quality). |
| 1. **Education and not immigration to meet Healthcare needs**, i.e. each country has to plan how cover its own HWF needs, migration is a right for the EU citizens but should not be used systematically as a source to cover the population’s need[[31]](#footnote-31) |

## What is a minimum data set?

A minimum data set is a minimum number of data items that has to be presented as an input to a decision-making process in order to be able to reach a certain goal. The decision-making process in this case is the planning for the future needs of the health work force. [[32]](#footnote-32)

*A Health Workforce Planning System consists of a core set of key indicators which are used, generally, at a national level, for the collection and reporting on key aspects of health system delivery, including current workforce/staffing resources and future Health workforce needs. This can enable the comprehensive analysis of supply, requirements and adequacy in professional-based workforce planning (WHO – 2008). The data are for planning as well as to promote coordination and collaboration between stakeholders at the national and European level.*[[33]](#footnote-33)

The process of collecting data is very costly in terms of time, use of resources, quality control, and necessary reiteration of the process. Thus it is necessary to contemplate the need of each data item before starting the process, balancing the cost of collecting and processing the information and the value of the decision to be made on the basis of that information.

## The elements of the minimum data set

In accordance with the principles and the definition presented above, a minimum dataset must contain the data necessary and sufficient to measure, by means of specific indicators (key planning indicators), the seven categories of the forecasting model (see Fig. 2). In particular, the key planning indicators presented in the next section measure the categories of the forecasting model that WP5 partners and experts have deemed priority in the light of to the three-stages scheme presented in section 4.1.So, **the set of data used in the key planning indicators formulas, which is necessary for the Minimum Purpose of Planning, is the MDS.**

The Health Workforce MDS for planning thus conceived is focused on physicians, pharmacists, dentists, nurses and midwives.

# Key planning indicators

Main elements of the key planning indicators are: Targets (i.e. why we plan) & rationale for them; Name and Definition of the indicator that allows to measure the achievement of the targets, Stratification and the Reason for / meaning of the indicator.

Below the key planning indicators are overall presented. To have the details of formula see Appendix 9.2.

***Key planning indicators to monitor the HWF targets of stage 1a***

| **Target** | **Indicator** | **Stratify by** | **Reason for the indicator** |
| --- | --- | --- | --- |
| -Identify high level imbalances vs. overall evaluation of the supply and the demand of Healthcare | **1. Coverage of future demand (high level)**  Numerator: Future supply  Denominator: Future demand  *See an example of this indicator in appendix 9.3* | Type of profession | The limitation of the stratification by type of profession (and not by specialisation, see indicator 3) concentrates the attention on the main questions of the balance in the market between supply and demand for each five professions considered and reduces the number of data to collect and to manage.  Depending on the values of the indicator, the country has a measure of the priority, i.e. the profession to start to study in more detail.  A value of the indicator >1 means a future surplus of professionals, a value = 1 means a balance between supply and demand, a value < 1 means a future shortage of professionals.  Please, note that the projection of demand starts from the assumption that currently there is balance between supply and demand. |

***Key planning indicators to monitor the HWF targets of stage 1b***

| **Target** | **Indicator** | **Stratify by** | **Reason for the indicator** |
| --- | --- | --- | --- |
| -Identify major affordability aspects of HWF;  -First evaluation on impact of imbalances on quality | **2. Affordability**  Numerator: Future health consumption  Denominator: Current health consumption | Depends on the responsibility for the health consumption. If it is on country level, the indicator will not be articulated further. | This indicator is forecasting the health consumption as a result of the changes in population. It is a base for overall evaluations of what the country can permit in relation to the total cost and, perhaps, which changes of the Health Production will be necessary in order to offer the same quality as today to the citizens.  A value of the indicator >1 means higher consumption in the future compared with the current situation, a value = 1 means a balance between future and current consumption, a value < 1 means lower consumption in the future as compared of today's situation. |
| -Monitor overall coverage  -Identify detailed imbalances  -Identify if inland production meets the needs  -First evaluation on impact of imbalances on quality | **3. Coverage of future demand, detailed**  Numerator: Future supply inland + Future potential supply from abroad  Denominator: Future demand  **4. Coverage of needs by foreign professionals today and in the future**  Numerator: N° of professionals with foreign first qualification.  Denominator: Total n° of professionals. | Type of profession.  **Single specialisation** within the type of profession. | The first indicator shows, for each specialisation, the future balance of the HWF in the country using the current legislation and the current organisation regarding education, retirement, migration etc. Any shortage (indicator <1) will require an action, for example on the number of intake in university. Any surplus (indicator >1) will need an action in the opposite direction.  The second indicator shows the part of the professionals that are covered by immigration from other countries. This is a potential critical issue as compared to the international policy of migration and regarding the need to introduce foreign professionals in the national system. |
| -Monitor geographical variances of coverage | **5. N° of professionals per inhabitant today and in the future**  Numerator: N° of professionals  Denominator: population  **6. N° of professionals per weighted inhabitant today and in the future**  Numerator: N° of professionals  Denominator: population weighted by the consumption per age group (basic index: average of EU countries) | **region** within the country articulated by macro-area in order to separate the greater municipal areas (for example Province in Italy, Department in France etc..). | The two indicators are complementary as the first one show the real figures of the number of professionals per inhabitant but might not be connected to the differences in age of the population. The second indicator makes it possible to compare different regions within a country and different countries. The method to weight the population is the same that is used to calculate the future demand (indicator 3).  There are no international standards for this indicator. Each country has to establish their own values as standard for these indicators that will be used to compare a region with another or a country with other countries and the current situation with the future situation. |

# Minimum data set

Here are listed the necessary and sufficient (minimum) data to create the indicators in described in the previous paragraph.

***Information needed for measuring the indicator 1 –***

***Minimum Data Set 1a (see appendix 9.2)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Areas** | **Supply** | | | | |  | **Demand** |
| **Category**  **Characterisation** | **Labour force** | **Training** | **Retirement** | **Migration (outflow)** | **Migration (inflow)** | **Population** |
| Type of profession | x | x | x | x | x |  |
| Age | x | x | x | x | x | X |
| Head count | x | x | x | x | x | X |

***Information needed for measuring the indicators 2, 3, 4, 5 and 6***

***Minimum Data Set 1b (see appendix 9.2)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Areas** | **Supply** | | | | |  | **Demand** |
| **Category**  **Characterisation** | **Labour force** | **Training** | **Retirement** | **Migration (outflow)** | **Migration (inflow)** | **Population** |
| Type | x | x | x | x | x |  |
| Age | x | x | x | x | x | x |
| Head count | x | x | x | x | x | x |
| FTE | x |  |  |  |  |  |
| Geographical area | x | x | x | x | x | x |
| Specialisation (where applied) | x | x | x | x | x |  |
| Country of first qualification | x | x | x | x | x |  |

# Appendices

## Appendix n 1. Some basic concepts for the indicators concerning the HWF demand

OECD has recently published two documents, OECD Health Working Papers n 59 "Comparative Analysis of Health Forecasting Methods"[[34]](#footnote-34) and OECD Economic Policy Papers n 6 "Public spending on health and long-term care: a new set of projections"[[35]](#footnote-35).

The first paper classifies the quantitative demand forecasting model proposed in this paper as "Component based models": indeed it forecasts health expenditure by component, such as by financing agent or providers of care and the forecast are usually estimated by age group. This type of forecasting models is the dominant class, accounting for more than half of all forecasting models surveyed by their study. One of the reasons for their proliferation is a focus on demographic drivers of health expenditure growth. They are also less data intensive and less complex than other type of models and they are considered most appropriate for short-term projections as they depend on clear and undisturbed trends. According to the study, virtually all existing models account for demographic shifts in the population and some focus specifically on scenarios about the potential future health status of older people. The study points out that two other important influences on health expenditure growth that are the least understood include technological innovation and the role played by changes in health-seeking behaviour and underlying social norms about health and illness, and that there is little empirical evidence on these factors upon which models may be developed.

Regarding "Demographical factors and health status", the authors report that around 25 % of life time health expenditures are concentrated in the last year of life and it might be that traditional projection methods overestimate the influence of population ageing because longevity gains could progressively postpone health expenditure from one age class to the next, rather than raise it. The relationship between life expectancy and morbidity can follow different paths. The first is known as the "health ageing" hypothesis, and assumes that increase of life expectancy corresponds to an equal increase in years of healthy life before the morbidity period prior to death. The second is a pessimistic view of expansion of morbidity where by increases in life expectancy yield a longer-time spent with ill-health and reduced quality of life. The third and opposite theory is known as "compression of morbidity" where longevity gains can be associated with an increase of healthy-life period.

The paper does not report evidence that one or another model is better than the others but concludes that the forecast models should be valued for their ability to demonstrate the likely future course of events, if past trends continue.

The second study compares the actual evolution of public health and long-term care expenditures with the projections made by an OECD study 2006. They find that the actual development of the last years was higher than the most expensive trend (called the "cost-pressure scenario"). The study then assumes the "compression of morbidity" relationship between life expectancy and morbidity (for definition see the first study above) and makes projections up to 2060. The projections shows that the more mature countries (the Nordic countries as well as the United States and the United Kingdom) will have a lower increase of costs while the poorer countries will have above average increases in public health expenditures. As an average, the percentage of GDP will increase in an interval between 3,5% of GDP to 8% of GDP. With the assumptions made, the demographic and income effects will play only a minor role in the projected increase of public health and long-term care expenditures.

When considering the implications of these two studies for this project we have to take into account that the projection period in our case will be around fifteen years and not fifty years. The past trends will therefore be more significant for the result. Even if the role of the ageing population to the increase of future expenditures is not certain (see the first study), but we think that, at the present state of art, it will represent a good assumption for our model. As the institutions and the policies may be an important part of the model, we think that it is necessary to discuss the effects with the policy makers and not only present the results as facts. The overall effect of the indicators, and in particular the indicators 2, 5 and 6 may help in these discussions.

## Appendix n.2 - Definition of each indicator

### Coverage of future demand, high level

|  |
| --- |
| Numerator: Future supply domestic + Future supply abroad  Denominator: Future demand  **Articulated by:** Type of profession |
| **Numerator: Future supply**  Future supply domestic= current stock + from education - retired  Future supply abroad = + immigration - emigration  **Current stock**: Current number of professionals (headcount) that are currently producing health care stratified by type (5 types) and age.  **From education**: Forecast of number of professionals (headcount) that complete education (basic or specialist) and are licensed to practice during the period. The first years will be calculated on the base of the current students in training; subsequently the actual training capacity (average of the statistics of the last years) of will be used.  **Retired:** Forecast of number of professionals (headcount) that will retire each year using the actual probability according to the existing laws of the country.  **Immigration:** Forecast of number of licensed and recognised professionals (headcount) that may enter the country calculated using the average of the last years.  **Emigration:** Forecast of number of practising professionals (headcount) that may leave the country calculated using the average of the last years. |
| **Denominator: Future demand**  Future demand = HWFpx=kp \*HCTx where  HCTx = ( HC10\*Pop1x + HC20\*Pop2x + HC30 \*Pop3x) (2)  HWFpx : The demand of a specific profession "p" (headcounts) in the year x.  kp: The constant that connects the total health production with the demand for a specific profession.  HCTx : The total health consumption in year x.(1)  HC10: The pro capite consumption of age group 1 in year 0 (basic year)  HC20: The pro capite consumption of age group 2 in year 0 (basic year)  HC30: The pro capite consumption of age group 3 in year 0 (basic year)  Pop1x: The population of age group 1 in year x.  Pop2x: The population of age group 2 in year x.  Pop3x: The population of age group 3 in year x.  **Note**(1)**:** it is important to check the sustainability of the total health consumption in year x compared with the current consumption.  **Note**(2): the values of these parameters are available from OECD / Eurostat / WHO |

### Relative Affordability

|  |
| --- |
| Numerator: Future health consumption  Denominator: Current health consumption  **Articulated by:** Depends on the institution responsible for the health consumption. If it is on country level, the indicator will not be articulated further, otherwise it has to be further detailed. |
| **Numerator: Future health consumption**  HCTx : The total health consumption in year x.  HCTx = ( HC10\*Pop1x + HC20\*Pop2x + HC30 \*Pop3x)  HCTx : The total health consumption in year x.  HC10: The pro capite consumption of age group 1 in year 0 (basic year)  HC20: The pro capite consumption of age group 2 in year 0 (basic year)  HC30: The pro capite consumption of age group 3 in year 0 (basic year)  Pop1x: The population of age group 1 in year x.  Pop2x: The population of age group 2 in year x.  Pop3x: The population of age group 3 in year x. |
| **Denominator: Current health consumption**:  HCT0 : The total current health consumption.  HCT0 = ( HC10\*Pop10 + HC20\*Pop20 + HC30 \*Pop30)  HC10: The current pro capite consumption of age group 1  HC20: The current pro capite consumption of age group 2  HC30: The current pro capite consumption of age group 3  Pop1x: The current population of age group 1.  Pop2x: The current population of age group 2.  Pop3x: The current population of age group 3. |

### Coverage of future demand, detailed

|  |
| --- |
| Numerator: Future supply domestic + Future potential supply from abroad  Denominator: Future demand  **Articulated by:** Type of profession, specialization within the profession, geographical area |
| **Numerator: Future supply**  Future supply domestic= current stock + from education - retired  Future potential supply from abroad = + immigration - emigration  **Current stock**: Current number of professionals (headcount) that are currently producing health care stratified by type (5 types) and age.  **From education**: Forecast of number of professionals (headcount) that complete education (basic or specialist) and are licensed to practice during the period. The first years will be calculated on the base of the current students in training; subsequently the actual training capacity (average of the statistics of the last years) of will be used.  **Retired:** Forecast of number of professionals (headcount) that will retire each year using the actual probability according to the existing laws of the country.  **Immigration:** Forecast of number of licensed and recognised professionals (headcount) that may enter the country calculated using the average of the last years.  **Emigration:** Forecast of number of practising professionals (headcount) that may leave the country calculated using the average of the last years. |
| **Denominator: Future demand**  Future demand = HWFpx=kp \*HCTx where  HCTx = ( HC10\*Pop1x + HC20\*Pop2x + HC30 \*Pop3x)  HWFpx : The demand of a specific profession "p" (headcounts) in the year x.  kp: The constant that connects the total health production with the demand for a specific profession.  HCTx : The total health consumption in year x.(1)  HC10: The pro capite consumption of age group 1 in year 0 (basic year)  HC20: The pro capite consumption of age group 2 in year 0 (basic year)  HC30: The pro capite consumption of age group 3 in year 0 (basic year)  Pop1x: The population of age group 1 in year x.  Pop2x: The population of age group 2 in year x.  Pop3x: The population of age group 3 in year x.  (1) **Note:** it is important to check the sustainability of the total health consumption in year x compared with the current consumption. |

### Coverage of needs by foreign professionals today and in the future

|  |
| --- |
| Numerator: N° of professionals with foreign first qualification.  Denominator: Total n° of professionals.  **Articulated by:** Type of profession, specialization within the profession, geographical area |
| **Numerator:** N° of professionals with foreign first qualification.  **Current stock of professionals with foreign qualification:** The part of the current stock with country of first qualification <> current country of activity.  **Future stock of professionals with foreign qualification:** The part of the future stock with country of first qualification <> current country of activity. |
| **Denominator**: Total n° of professionals.  **Total current stock**: Current number from indicator 3.  **Total future stock:** Numerator of indicator 3 |

### N° of professionals per inhabitant today and in the future

|  |
| --- |
| Numerator: N° of professionals  Denominator: population  **Articulated by:** Type of profession, specialization within the profession, geographical area |
| **Numerator: Actual number of professionals**  **Actual number of professionals:** From indicator 3  **Future number of professionals:** From indicator 3 |
| **Denominator:** population  Actual population: Number of population (without weighting)  **Future population:** Number of population (without weighting) from a reliable institute of forecasting. |

### N° of professionals per weighted inhabitant today and in the future

|  |
| --- |
| Numerator: N° of professionals  Denominator: weighted population  **Articulated by:** Type of profession, specialization within the profession, geographical area |
| **Numerator: Actual number of professionals**  **Current number of professionals:** From indicator 3  **Future number of professionals:** From indicator 3 |
| **Denominator:** population  Current population: Number of inhabitants weighted by the health consumption for each age group (average current EU countries).  **Future population:** Number of population from a reliable institute of forecasting weighted by the health consumption for each age group (average actual EU countries). |

## Appendix n.3 – Two examples of calculation for the indicator 1

In order to make the calculation more clear we have included two examples of the calculation of the demand formulas in the Indicator 1:

* 1. calculation of the actual and the future health consumption (the main alternative) or
  2. calculation of the weighted population (the alternative presented on page x).

The supply formulas are the same in the two examples.

### Example a The indicator 1 (Physicians) with the demand calculated on the base of the future health consumption

**Numerator: Future supply 2028 (Italian figures)**

*Future supply = current stock + from education - retired + immigration -emigration*

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | |  |
| **Current stock (practising)** | **254.000** | |  |
|  |  | |  |
| **From education (2013-2028)** | **140.578** | | *estimation* |
|  |  | |  |
| **Retired (2013-2028)** | **168.597** | | *estimation* |
|  |  | |  |
| **Immigration (2013-2028)** | **3.819** | | *estimation* |
|  |  | |  |
| **Emigration (2013-2028)** | **7.918** | | *estimation* |
|  |  | |  |
| **Future supply 2028** | **221.883** | |  |
| *(254.000 + 140.478 - 168.597 + 3.819 - 7.918)* | | |  |
|  | |  |  |

**Denominator: Future demand 2028 (Italian population)**

**Step 1 Construction of the current health consumption.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Actual population** |  |  |  |
|  | **N° of inhabitants (a)** | **Health consumption (euro per person, European average) (b)** | **Health consumption (millions of euro) (a)\*(b)/1.000.000** |
| Pop1 = population aged 0-14 | 8.325.217 | 772 | 6.427 |
| Pop2 = population aged 15-64 | 38.698.168 | 1.287 | 49.805 |
| Pop3= population aged 65+ | 12.370.822 | 3.861 | 47.764 |
| Total Italian population | 59.394.207 |  | 103.995 |

**Step 2 Calculation of the conversion factor for physicians**

|  |  |  |
| --- | --- | --- |
| Current number of physicians | 254.000 |  |
| *kp* | 2,442417 | (254.000/103.995) |

**Step 3 Calculation of the future health consumptio**n

|  |  |  |  |
| --- | --- | --- | --- |
| **Population 2028** |  |  |  |
|  | **N° of inhabitants (a)** | **Health consumption (euro per person, European average) (b)** | **Health consumption (millions of euro) (a)\*(b)/1.000.000** |
| Pop1 = population aged 0-14 | 8.073.662 | 772 | 6.233 |
| Pop2 = population aged 15-64 | 39.374.526 | 1.287 | 50.675 |
| Pop3= population aged 65+ | 15.893.206 | 3.861 | 61.364 |
| Total Italian population | 63.341.394 |  | 118.272 |

**Step 4 Calculation of the future number of physicians**

|  |  |  |
| --- | --- | --- |
| *kp* | 2,442417 |  |
| Number of physicians 2028 | 288.868 | (118.272 \* 2,442417) |

**Indicator 6.1.1 = coverage of future demand**

|  |  |  |  |
| --- | --- | --- | --- |
| **Future supply 2028/Future demand 2028** | **0,8** | **is < 1** | **Future shortage** |

(221.883 / 288.868)

### Example 2 b The indicator 1 (Physicians) with the demand calculated on the base of the future weighted population

**Numerator: Future supply 2028 (Italian figures)**

*Future supply = current stock + from education - retired + immigration -emigration*

|  |  |  |
| --- | --- | --- |
| **Current stock (practising)** | **254.000** |  |
|  |  |  |
| **From education (2013-2028)** | **140.578** | *estimation* |
|  |  |  |
| **Retired (2013-2028)** | **168.597** | *estimation* |
|  |  |  |
| **Immigration (2013-2028)** | **3.819** | *estimation* |
|  |  |  |
| **Emigration (2013-2028)** | **7.918** | *estimation* |
|  |  |  |
| **Future supply 2028** | **221.883** |  |
| *(254.000 + 140.478 - 168.597 + 3.819 - 7.918)* | |  |

**Denominator: Future demand 2028 (Italian population)**

*Future demand (HWF2028) =kp \* HCT2028*

**Step1 Construction of a Weight for each age group**

|  |  |  |
| --- | --- | --- |
| **Actual consumption of health care** |  |  |
|  | **Health expenditure**  **(euro per person**  **European average)** | **Weight per age group** |
| Pop1 = population aged 0-14 | 772 | 0,6 |
| Pop2 = population aged 15-64 | 1.287 | 1 |
| Pop3= population aged 65+ | 3.861 | 3 |
| Total Italian population |  |  |

**Step 2 Construction of the current weighted population (Italian population).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Actual population** |  | |  |  |
|  | **N° of inhabitants (a)** | | **Weight (b)** | **Weighted pop = (a)\*(b)** |
| Pop1 = population aged 0-14 | 8.325.217 | | 0,6 | 4.995.130 |
| Pop2 = population aged 15-64 | 38.698.168 | | 1 | 38.698.168 |
| Pop3= population aged 65+ | 12.370.822 | | 3 | 37.112.466 |
| Total Italian population | 59.394.207 | |  | 80.805.764 |
|  |  | |  |  |
| **Step 3 Calculation of the conversion factor for physicians** | | | | |
| Kp = current number of practising physicians/weighted population \* 1000 | | | |  |
| Kp = 254.000 / 80.805.764 \* 1.000 | | | |  |
| **Kp** | **0,00314** | |  |  |
| **Step 4 Calculation of the future weighted population** | | | | |
| Population 2028 |  | |  |  |
|  | **N° of inhabitants (a)** | | **Weight (b)** | **Weighted pop = (a)\*(b)** |
| Pop1 = population aged 0-14 | 8.073.662 | | 0,6 | 4.844.197 |
| Pop2 = population aged 15-64 | 39.374.526 | | 1 | 39.374.526 |
| Pop3= population aged 65+ | 15.893.206 | | 3 | 47.679.618 |
| Total Italian population | 63.341.394 | |  | 91.898.341 |
| **HCT*2028*** | **91.898.341** | |  |  |
| **Step 5 Calculation of the future demand of practising physicians** | | | | |
| **Future demand 2028 *(HWF2028):***  *0,00314 \* 91.898.341 =* | | | | |
|  | | **288.868** |  |  |
|  | |  |  |  |

**Indicator 6.1.1 = coverage of future demand**

|  |  |  |  |
| --- | --- | --- | --- |
| **Future supply 2028/Future demand 2028** | **0,8** | **is < 1** | **future shortage** |

## Appendix n.4 - Minority opinions

There were no proposed additional key planning indicators which change the contents of the MDS.

## Appendix n.5 – Glossary

| **ITEM (alphabetical order)** | **DEFINITION** |
| --- | --- |
| Age group | Population by single year of birth or age groups (i.e.: 0-4; 5-9; 10-14;.... 60-64;65+). |
| Dentists | Dental practitioners*(see Directive EC/2005/36 section 4, article 34).* |
| Emigration (outflow) | Annual number of professionals exiting from the Country for practising profession full time abroad. |
| Forecasting model (quantitative) | A quantitative forecasting model is a set of formal statement about variables and relationships among variables. The scope is to estimate future data as a function of past data (time series, cross-sectional or longitudinal data) on the base of specific assumptions. Accordingly it is appropriate when past data are available. Quantitative forecasting models are usually applied to short- or intermediate-range decisions. On the other hand, qualitative forecasting models (in which estimations are based on the opinion and judgment of experts, stakeholders or users) are appropriate when past data are not available and they are usually applied to intermediate- or long-range decisions. |
| Full time equivalent (FTE) | Unit to measure [employed persons](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Employment) in a way that makes them comparable although they may work a different number of hours per week.  The unit is obtained by comparing an employee's [average number of hours worked](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Average_number_of_hours_worked) to the average number of hours of a full-time worker. A full-time person is therefore counted as one FTE, while a part-time worker gets a score in proportion to the hours he or she works or studies. For example, a part-time worker employed for 24 hours a week where full-time work consists of 48 hours, is counted as 0.5 FTE. |
| Labour force | Current number of professionals (headcount) that are currently producing health care in the Country/Region. |
| Midwives | Midwives *(see Directive EC/2005/36 section 6, article 40).* |
| Migration (inflow) | Annual number of licensed and recognised professionals entering the Country. |
| Nurses | Nurses responsible for general care*(see Directive EC/2005/36 section 3, article 31)* |
| Pharmacists | Pharmacists *(see Directive EC/2005/36 section 7, article 44).* |
| Physicians | Doctors of medicine *(see Directive EC/2005/36 section 2, article 24).* |
| Planning process | The planning process is the set of organized activities, task lists and schedules required to achieve the objectives defined in the health workforce planning system. It includes the making and maintenance of a plan and it combines forecasting of developments with the preparation of scenarios of how to react to them (strategies). In these meaning it is the counterpart of the spontaneous order. The planning process is a fundamental function of management since it is aimed at the best satisfaction of the needs given the resources available. |
| Planning system | The planning system is used to make decisions about the future development and use of health workforce (“*what it should look like in the future*”). It considers both the internal and external factors that affect the health workforce supply and demand (where development should happen, where it should not and how development should be). The planning system balances different interests to make sure that the healthcare system works and it is developed in a way that creates high quality at sustainable costs. The health workforce planning systems in the different Countries will tend to vary and are flexible due to the periodic and adaptive nature of the applied strategy. These will also have political aspects. |
| Population | Number of inhabitants in the Country or Region considered at the reference date (Source: National Institute of Statistics). |
| Professions | Health professions included in the Directive 2005/36/EC of the European Parliament and of the Council on the recognition of professional qualifications: physicians, nurses, midwives, pharmacists, dentists *(please see details in the items).* |
| Retirement | Annual number of professionals retiring from labour market. |
| Shortage | Negative gap between supply and demand. |
| Training | Annual number of professionals who complete education (basic or specialist) and are licensed to practice. |

## ***Appendix n. 6 - Table of references***

|  |
| --- |
|  |
| Matrix Insight Ltd, in collaboration with the Centre for Workforce Intelligence (CfWI) - for EC - 2012 |
| Commission feasibility study on EU level collaboration on forecasting health workforce needs, workforce planning and health workforce trend |
| <http://ec.europa.eu/health/workforce/key_documents/study_2012/index_en.htm> |
|  |
| Tomoko Ono, Gaetan Lafortune, Michael Schoenstein. OECD Health Working Papers, No. 62, OECD Publishing. - 2013 |
| Health Workforce Planning in OECD Countries: A Review of 26 Projection Models from 18 Countries |
| <http://www.oecd-ilibrary.org/social-issues-migration-health/health-workforce-planning-in-oecd-countries_5k44t787zcwb-en> |
|  |
| WHO Library Cataloguing (in Publication Data) - 2008 |
| WHO human resources for health minimum data set |
| <http://www.who.int/hrh/documents/hrh_minimum_data_set.pdf> |
|  |
| OECD-WHO - |
| Draft guidelines on monitoring the implementation of the WHO Global Code on the International Recruitment of Health Personnel. *Part II* – Regular national reporting instrument – Section 2: Quantitative information – Minimum Data Sets |
| <http://www.who.int/hrh/migration/section_2_quantitative.pdf> |
|  |
| WHO - 2009 |
| WHO - Handbook on Monitoring and Evaluation of Human Resources for Health |
| <http://www.who.int/hrh/resources/handbook/en/> |
|  |
| Bartosz Przywara - 2010 |
| Projecting future health care expenditure al European level: drivers, methodology and main results |
| <http://ec.europa.eu/economy_finance/publications/economic_paper/2010/ecp417_en.htm> |
|  |
| Christine de la Maisonneuve, Joaquim Oliveira Martins - 2013 |
| Public spending on health and long-term care: a new set of projections |
| <http://www.oecd.org/eco/growth/Health%20FINAL.pdf> |
|  |
| Roberto Astolfi, Luca Lorenzoni, Jillian Oderkirk - 2012 |
| A comparative analysis of health forecasting methods |
| <http://search.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DELSA/HEA/WD/HWP(2012)2&docLanguage=En> |
|  |
| Leonie Segal, Tom Bolton - 2009 |
| Issues facing the future health care workforce: the importance of demand modelling |
| <http://www.anzhealthpolicy.com/content/pdf/1743-8462-6-12.pdf> |
|  |
| WHO - 2010 |
| WHO Global Code of Practice on the International Recruitment of Health Personnel |
| <http://www.who.int/hrh/migration/code/code_en.pdf> |
|  |
| European Commission - 2008 |
| GREEN PAPER On the European Workforce for Health |
| <http://ec.europa.eu/health/ph_systems/docs/workforce_gp_en.pdf> |
|  |
| Harpa Guðnadóttir, Marías Halldór Gestsson; Sólveig Fríða Jóhannsdóttir – 2009 |
| Health workforce forecast |
|  |
|  |
| Stephen Birch, George Kephart, Gail Tomblin Murphy, Linda O’Brien-Pallas, Rob Alder, and Adrian MacKenzie |
| Health Human Resources Planning and the Production of Health: Development of an Extended Analytical Framework for Needs-Based Health Human Resources Planning |
| <http://ccoms-imsuerj.org.br/capfts/2011/uploads/Health_Human_Resources_Planning_and_the_Production.14.pdf> |
|  |
| O'Brien-Pallas L, Baumann A, Donner G, Murphy GT, Lochhaas-Gerlach J, Luba M. - 2001 |
| Forecasting models for human resources in health care |
| <http://www.ncbi.nlm.nih.gov/pubmed/11155116> |
|  |
| Dominique Roberfroid\*, Christian Leonard and Sabine Stordeur - 2009 |
| Physician supply forecast: better than peering in a crystal ball? |
| <http://www.biomedcentral.com/content/pdf/1478-4491-7-10.pdf> |
|  |
| Leonie Segal\* and Tom Bolton - 2009 |
| Issues facing the future health care workforce: the importance of demand modelling. |
| <http://www.anzhealthpolicy.com/content/pdf/1743-8462-6-12.pdf> |
|  |
| Walter Sermeus, Linda H Aiken, Koen Van den Heede1, Anne Marie Rafferty, Peter Griffiths, Maria Teresa Moreno-Casbas, Reinhard Busse, Rikard Lindqvist, Anne P Scott, Luk Bruyneel, Tomasz Brzostek, Juha Kinnunen, Maria Schubert, Lisette Schoonhoven, Dimitrios Zikos and RN4CAST consortium - 2009 |
| Nurse forecasting in Europe (RN4CAST): Rationale, design and methodology |
| <http://www.biomedcentral.com/content/pdf/1472-6955-10-6.pdf> |
|  |
| Jonathan P. Weiner |
| A Shortage Of Physicians Or A Surplus Of Assumptions? |
| <http://content.healthaffairs.org/content/21/1/160.full.html> |
|  |
| Malou Van Greuningen\*, Ronald S Batenburg and Lud FJ Van der Velden - 2012 |
| Netherlands - Ten years of health workforce planning in the Netherlands: a tentative evaluation of GP planning as an example |
| <http://www.human-resources-health.com/content/pdf/1478-4491-10-21.pdf> |
|  |
| Sabine Stordeur and Christian Léonard |
| Challenges in physician supply planning: the case of Belgium |
| <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3017009/> |
|  |
| DOMINIQUE ROBERFROID, SABINE STORDEUR, CECILE CAMBERLIN, CARINE VAN DE VOORDE, FRANCE VRIJENS, CHRISTIAN LEONARD |
| KCE reports 72C : Physician workforce supply in Belgium: current situation and challenges |
| <https://kce.fgov.be/sites/default/files/page_documents/d20081027309.pdf> |
|  |
| Karen Bloor, Alan Maynard - University of York - 2003 |
| Planning human resources in health care: Towards an economic approach. An international comparative review |
| <http://www.fcass-cfhi.ca/Migrated/PDF/ResearchReports/CommissionedResearch/bloor_report.pdf> |
|  |
| Tomblin Murphy G, Kephart G, Lethbridge L, O'Brien-Pallas L, Birch S. - 2009 |
| Planning for what? Challenging the assumptions of health human resources planning. |
| <http://www.ncbi.nlm.nih.gov/pubmed/19443074> |
|  |
| European Commission Staff Working Document (2012) 93 final - 2012 |
| Action Plan for the EU health workforce |
|  |

## ***Appendix n. 7 – WP5 general description***

### WP5 scope

Work Package 5 (WP5) aim is to promote and support the use of quantitative model-based planning methodologies (both supply-side and demand-side) based on what is in use today or shortcomings in EU countries and a “good practices” evaluation.

Health professions in focus are doctors, nurses, pharmacists, dentists and midwifes (the five health professions covered by the Recognition of Professional Qualifications Directive).

### WP5 actions

The WP5 specific Objective is to ”*define guidelines on quantitative HWF planning methodology and increased quantitative planning capacity*”.

| **N#** | **Title** | |  | **WHEN** | |
| --- | --- | --- | --- | --- | --- |
| **3.1** | **Minimum data set (MDS)** | | | | |
|  | MILESTONES 5.1 | Agreement on the minimum data set | | | October 2013 |
| **DELIVERABLE D.051** | Minimum planning data requirements | | | November 2013 |
|  | | | | | |
| **3.2** | **Exchange of good practices** | | | | |
|  | MILESTONES 5.2 | Experts group conference on HWF planning methodologies | | | April 2014 |
| **DELIVERABLE D.052** | Report of good practices in planning methodologies | | | September 2014 |
| **DELIVERABLE D.053** | Web portal on HWF planning methodologies, with WP2 | | | January 2015 |
|  | | | | | |
| **3.3** | **Defining and experimenting guide lines on HWF planning (cookbook)** | | | | |
|  | MILESTONES 5.3 | Validation of the cookbook | | | March 2015 |
| MILESTONES 5.4 | Start-up of the Pilot studies | | | June 2015 |
| MILESTONES 5.5 | Finalisation of the cookbook | | | September 2015 |
| **DELIVERABLE D.054** | Report on WP5 pilot study experiences | | | March 2016 |

### WP5 team members

WP5 is managed by Italy. The WP5 Team Leader is Giovanni Leonardi, General Director Health Professions and Human Resources at Ministry of Health.

There are two Italian organisations covering the competencies of WP5: the Ministry of Health (MoH) and the National Agency for Regional Healthcare (AGENAS); their roles, within the project, were divided accordingly.

Their primarily responsibilities are:

|  |  |  |
| --- | --- | --- |
| **MoH** |  | **AGENAS** |
| * Results of WP5 | * Project management |
| * Represent the Italian knowledge broker | * Methodology of research |
| * Relationships with international contacts | * Budget and reporting management |
| * Dissemination to Italian stakeholders | * Logistics and organisation of meeting |
| * Pilot study project | * Operational secretariat |

Italian team

|  |  |  |
| --- | --- | --- |
| **Ministry of Health** |  | **AGENAS** |
| Giovanni Leonardi - WP5 Leader | Achille Iachino |
| Egle Parisi | Ragnar Gullstrand |
| Annalisa Malgieri | Paolo Michelutti |
| Cristina Sabatini | Anna Maria Pacini |

Italy is supported by WP5 Partners and experts, divided into WP Leaders, Associated and Collaborative partners, which together make up the team. They are:

|  |  |  |  |
| --- | --- | --- | --- |
| **WP Leader** | | | |
| **Country** | **Acronym** | **Role** | **Name** |
| 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 |
| United Kindom | UK\_DoH | Matt Edwards | WP6 Leader |
| United Kindom | UK\_DoH | John, Fellows | WP6 Team member |
| Bulgaria | BG\_MUV | Todorka Kostadinova | WP7 Leader |
| Europe | STAK\_EAHC | Caroline Hager | EC Representative |
| Europe | STAK\_EC | Balazs Lengyel | EC Representative |
| Europe | STAK\_EC | Antoniette Martiat | EC Representative |
| Europe | STAK\_EC | Angela Blanco | EC Representative |

|  |  |  |
| --- | --- | --- |
| **Associated partners** | | |
| **Country** | **Acronym** | **Name** |
| Belgium | BE\_FPS | Pieter-Jan Miermans |
| Bulgaria | BG\_NCPHA | Nastashka Danova |
| Bulgaria | BG\_NCPHA | Milena Vladimirova |
| Bulgaria | BG\_NCPHA | Plamen Dimitrov |
| Bulgaria | BG\_MUV | Nikolina Radeva |
| Finland | FI\_MOH | Reijo Ailasmaa |
| Germany | DE\_UNI-HB | Melanie Boeckmann |
| Germany | DE\_UNI-HB | Heinz Rothgang |
| Greece | EL\_NSPHJ | Despena Andrioti |
| Hungary | HU\_SU | Eszter Kovacs |
| Hungary | HU\_SU | Edit Eke |
| Hungary | HU\_SU | Edmond Girasek |
| Iceland | IS\_MOH | Valgerdur Gunnarsdottir |
| Netherlands | NL\_CAPORG | Victor Slenter |
| Netherlands | NL\_MOH | Leon Van Berkel |
| Poland | PL\_MOH | Aleksandra Kotowicz |
| Poland | PL\_MOH | Bartosz Baran |
| Portugal | PT\_ACSS | Ivo Rui Santos |
| Portugal | PT\_ACSS | Filomena Parra da Silva |
| Portugal | PT\_ACSS | Ana Paula Gouveia |
| Portugal | PT\_ACSS | Gustavo Ferreira |
| Slovenia | SI\_IVZ | Rade Pribakovic |
| Spain | ES\_MOH | Pilar Carbajo |
| Spain | ES\_MOH | Mercedes De Jorge |
| Spain | ES\_MOH | Sebas Martin |
| Europe | STAK\_AMREF | Giulia De Ponte |
| Europe | STAK\_EFN | Silvia Gomez |
| Europe | STAK\_EFN | Alessia Clocchiatti |
| Europe | STAK\_EFN | Paul de Raeve |
| Europe | STAK\_HOPE | Isabella Notarangelo |
| Europe | STAK\_PGEU | Patricia Munoz |
| Europe | STAK\_PGEU | John Chave |

|  |  |  |
| --- | --- | --- |
| **Collaborating partners** | | |
| **Country** | **Acronym** | **Name** |
| Belgium | BE\_FPS | Peter Willemé |
| Denmark | DK\_DHMA | Anders Haahr |
| Germany | DE\_KBV | Filip J. Lassahn |
| Ireland | IE\_DoH | Gabrielle Jacob |
| Italy | IT\_AIC | John Williams |
| Moldova | MD\_MoH | Eugenia Berzan |
| Moldova | MD\_MoH | Nicolae Jelamschi |
| Serbia | RS\_IPHS | Milena Vasic |
| Serbia | RS\_UNI-BG | Milena Santric Milicevic |
| Europe | STAK\_ENMCA | Tanja Schubert |
| Europe | STAK\_ENMCA | Marie Colegrave-Juge |
| Europe | STAK\_UEMO | Marie-Christine Bonnamour |
| Europe | STAK\_IOM | Benedict Roumyana |
| Europe | STAK\_IOM | Giuliana Urso |
| Europe | STAK\_OECD | Michael Schoenstein |
| Europe | STAK\_OECD | Tomoko Ono |
| Europe | STAK\_WHO | Galina Perfilieva |

## ***Appendix n. 8 – WP5 workshop minutes – Milan 19th – 20th of September 2013***

See the pdf document external to this document.

1. See Bartosz P. (2010), Astolfi R., Lorenzoni L. Oderkirk J. (2012) and De la Maisonneuve, Martins (2013) for an analysis of the economic impact of the various determinants in healthcare demand. [↑](#footnote-ref-1)
2. See Green paper on the European Workforce for Health, European Comission, 2008. [↑](#footnote-ref-2)
3. Action PLan for the EU health workforce, Commission Staff Working Document (2012) 93 final. [↑](#footnote-ref-3)
4. Feasibility Study: EU level collaboration on Forecasting Health Workforce Needs, Workforce Planning and Health Workforce Trends, Matrix Insight Ltd for the European Commission, May 2012 [↑](#footnote-ref-4)
5. See note 4. [↑](#footnote-ref-5)
6. <http://ec.europa.eu/health/workforce/policy/planning/index_en.htm> [↑](#footnote-ref-6)
7. See Directive EU/2005/36 on the recognition of professional qualifications. [↑](#footnote-ref-7)
8. WHO human resources for health minimum data set – 2008. [↑](#footnote-ref-8)
9. See the list in Appendix n° 9.7. [↑](#footnote-ref-9)
10. The key planning indicators and the minimum data set presented in the next sections reflect the priorities agreed by the Workpackage 5 partners within the EUHWF Joint Action framework and the feedback from the MDS workshop held in Milan on the 19th and 20th of September 2013. [↑](#footnote-ref-10)
11. The Minimum Data Set is not intended to provide (or replace) a country-level workforce planning system. Suggestions for supplementary information are also given so that the MDS can be adapted or developed, if required, to support domestic workforce planning. [↑](#footnote-ref-11)
12. See note 4. [↑](#footnote-ref-12)
13. See note 4. (p.146) [↑](#footnote-ref-13)
14. See glossary, in Appendix 9.5. [↑](#footnote-ref-14)
15. For a review of the objectives of the HWF planning system in the EU Countries see Matrix (2012) and OECD (2013). [↑](#footnote-ref-15)
16. The Workpackage 5, within the EUHWF Joint Action frame work, in July 2013 has started a survey on the EU MSs using the conceptual model described in this paragraph in order to update and integrate the Country profile presented in the Feasibility Study (see note 2). The first results of this survey, regarding 13 EU MSs, were used to check the sustainability of the “common minimum data set” described in the section 8. [↑](#footnote-ref-16)
17. See glossary, in Appendix 9.5. [↑](#footnote-ref-17)
18. See glossary, in Appendix 9.5. [↑](#footnote-ref-18)
19. OECD, Health Workforce Planning in OECD Countries 2013 p. 11. [↑](#footnote-ref-19)
20. See WP5 Minutes Milan Workshop, in Appendix 9.8. [↑](#footnote-ref-20)
21. On the other hand, in the qualitative forecasting models the estimations are based on the opinion and judgment of experts, stakeholders or users and they are appropriate when past data are not available. [↑](#footnote-ref-21)
22. WHO - 2009 [↑](#footnote-ref-22)
23. Astolfi R., Lorenzoni L. Oderkirk J. (2012) [↑](#footnote-ref-23)
24. The indicators 5 and 6 proposed in the section 7, articulated by geographical area, are useful just to measure the impact of the mobility flows in a specific geographical area. [↑](#footnote-ref-24)
25. See note 20. [↑](#footnote-ref-25)
26. See Zegal L., Bolton T. – 2009 [↑](#footnote-ref-26)
27. See Przywara B. (2010); Astolfi R. et al. (2012); De la Maisonneuve C. et al. (2013) [↑](#footnote-ref-27)
28. See the analyzis done by the Working Group on Ageing Population and Sustainability (AWG) of the Economic Policy Committee (<http://europa.eu/epc/working_groups/ageing_en.htm>) [↑](#footnote-ref-28)
29. Source: Ragioneria dello Stato. [↑](#footnote-ref-29)
30. For a disquisition on the proposal demand model see Appendix 9.1 [↑](#footnote-ref-30)
31. See WHO Global code of practice on the international recruitment of health personnel (2010) [↑](#footnote-ref-31)
32. The Feasibility Study suggests a "common" data set in order to facilitate the exchange of information across Europe and across regions. In this case common means a data set that is the same for all Member States. As today's situation of planning is very different between the EU countries, the EC has found that it is more important to define a "minimum" data set that will fulfill the basic need for planning in a Member State that starts the HWF planning process. [↑](#footnote-ref-32)
33. See note 4. [↑](#footnote-ref-33)
34. OECD 2012. [↑](#footnote-ref-34)
35. OECD 2013. [↑](#footnote-ref-35)