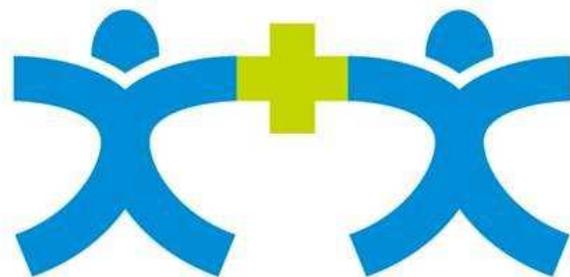




Final Version
Report on Health Workforce Planning Data
Preparing for tomorrow's meaningful actions
WP4 Semmelweis University, Hungary

Report on Health Workforce Planning Data D.043



Joint Action Health Workforce
Planning and Forecasting

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The Joint Action on Health Workforce Planning and Forecasting

The Joint Action (JA) on European Health Workforce (HWF) Planning and Forecasting is a three-year programme running from April 2013 to June 2016 that brings together partners representing countries, regions and interest groups from across Europe and beyond, including non-EU countries and international organisations. The JA is supported by the European Commission within the framework of the European Action Plan for the Health Workforce, which highlights the risk of critical shortages of health professionals in the near future.

The main objective of the Joint Action on European Health Workforce Planning and Forecasting (JA EUHWF) is to provide a platform for collaboration and exchange between partners, in order to better prepare Europe's future health workforce. The JA aims to improve the capacity for health workforce planning and forecasting by supporting collaboration and exchanges between Member States (MS) and by providing state-of-the-art knowledge on quantitative and qualitative planning. By participating in the Joint Action, competent national authorities and partners are expected to increase their knowledge, improve their tools, and succeed in achieving greater effectiveness in workforce planning processes. By forecasting the impact of healthcare engineering policies and re-designing education capacity for the future, the outcomes of the Joint Action should contribute to the development of a sufficient number of health professionals and aid in minimising the gaps between the need for and supply of health professionals equipped with the right skills.

This document contributes to achieving that aim by providing an analysis of HWF Planning data in European Member States.

This document was approved by the Executive Board of the Joint Action on Health Workforce Planning & Forecasting on 13 April 2016.



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Contributors and Acknowledgements

The present report was prepared by the Work Package 4 team at the Health Services Management Training Centre of Semmelweis University, Budapest, Hungary.

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Glossary

Term	Definition
Applicability	The relevance, suitability, practicability, capable of being done, effected or put into practice, appropriateness of data and methods.
Checklist	A list of items required, things to be done, or points to be considered. Checklists usually offer a yes/no format in relation to the demonstration of specific criteria. Checklists are used to encourage or verify that a number of specific lines of inquiry, steps, or actions are being taken (Andrews 2008).
Database	The terms database and data set are often used interchangeably. A database is a logical collection of values relating to a single subject (OECD Glossary for statistical terms).
Dataset	Any organised collection of data can be understood as a collection of similar data that shares a structure, which covers a fixed period of time (OECD Glossary for statistical terms).
Domestic (national) HWF	The HWF of a country, optimally in regards to practising HWF, in reality depending on the indicator that is used to describe the stock of HWF in said country.
Estimate	An approximate calculation or judgement of the value, number, quantity, or extent of something.
Feasibility	The usefulness, utility, probability, likelihood of something happening, being easily, conveniently done (good communication flow, accessible and available data sources, engaged stakeholders, commitment at national level, etc.).
Flow data	The movements inside and outside the health workforce and across countries (EC FS, 2012).
Guideline	A series of recommendations by experts, compilation of successful actions (DeRoche 2012).
Healthcare cost	One aspect of healthcare consumption, with care-seeking behaviours varying across different socioeconomic groups (Kristensson, 2008).
Healthcare consumption	The annual consumption of healthcare goods and services in various healthcare establishments, the ongoing healthcare use of institutes, and reliance on the health system requires knowledge about healthcare contact patterns in various settings and costs across various agencies during (mostly) annual periods (specific types: hospital readmissions, length of hospital stay, referral to long-term care and special units).
Health consumption expenditures	They include all personal health care spending, government administration and the net cost of private health insurance and public health activities (National Health Expenditure Accounts Methodology Paper, 2010).
Health production	The maximum output of healthcare services that can be produced out of a given combination of human resources and non-human resources (D052).
Healthcare quality	The quality of healthcare, health systems, and the outcomes that they produce, achieved for both individual service users and whole communities. There are six dimensions of quality: effective, efficient, accessible, acceptable/patient-centred, equitable and safe (WHO, 2006).

Health workforce	The overarching term for the body of health professionals (trained and care workers directly involved in the delivery of care) working in a healthcare system.
HWF forecasting	Estimating the required health workforce to meet long-term future health service requirements and the development of strategies to meet those requirements (Roberfroid et al., 2009).
HWF mobility	The geographical, international cross-border HWF mobility (inflow and outflow), both across European countries and between European and non-European countries (EC FS 2012). Any intentional change of country after graduation with the purpose and effect of delivering health-related services, including during training periods (Wismar et al. 2011).
HWF mobility data	Numerical data that can specifically address/reveal one aspect of HWF mobility. The usual use of this term implies both HWF mobility data and (common) HWF mobility indicators.
HWF mobility indicator	A ratio that compares HWF mobility data to other HWF data to indicate the volume and/or significance and/or role of foreign HWF in a country/region/EU.
HWF monitoring	Analysing the current situation and aiming to respond to the challenges posed by the current situation (D052). Data on the current and future health workforce are collected to monitor performance and forecasts (EC FS, 2012).
HWF planning	Strategies that address the adequacy of the supply and distribution of the health workforce according to policy objectives and the consequential demand for health labour (D052). Ensuring the right number and type of health human resources are available to deliver the right services to the right people at the right time (Birch et al. 2009).
Health professional	Individuals working in the provision of health services, whether as individual practitioner or as an employee of a health institution or programme. Health professionals are often defined by law through their set of activities reserved under provision of an agreement based on education pre-requisites or equivalent.
Indicator (key planning)	A quantitative or qualitative measure of a system that can be used to determine the degree of adherence to a certain standard or benchmark.
Inflow	Inflows reflect the number of health professionals entering the health sector from another country. The number of health workers entering the health sector from abroad might include foreign-trained staff or foreign-born staff (EC FS, 2012). The act of (either temporarily or permanently) moving into a country in this context, in order to practice a profession.
Licensed to practice (LTP)	Health professionals entitled to practice as health professionals (D041).
Minimum data set (MDS) for Health Workforce Planning	A widely agreed upon set of terms and definitions constituting a core of data acquired for reporting and assessing key aspects of health system delivery.
Outflow (Emigration)	Outflows reflect the number of health professionals leaving a country (Wismar et al, 2011). The act of leaving one's current country in this context, with the intention to practice a profession abroad.

Professionally active (PA)	The “practising” category plus other health professionals working in administration and research who do not directly provide services to patients, but for whom their medical education is a prerequisite for the execution of the job (D041).
Practising (P)	Health professionals directly providing services to patients (D041).
Population needs	Population healthcare needs are the requirements of care and services at the individual, family, community and population level to achieve physical, cognitive, emotional and social wellbeing, taking into account the broad determinants of health (D051).
Protocol	A detailed written set of instructions to guide the performance of HWF Planning; a detailed plan for a procedure on how professionals should act under certain circumstances (DeRoche, 2012).
Proxy indicator	An indirect measure or sign that approximates or represents a phenomenon in the absence of a direct measure or sign.
Rating scale	Rating scales state criteria and provide three or four response selections to describe quality, level of agreement or frequency (Alberta Assessment Consortium 2005).
Skill list	A list that attempts to identify and define the requirements for effective performance by setting up a diverse sets of skills and competencies that are required for team success as well as to enhance team performance (Leggat 2007); a list containing personal attributes that enhance an individual’s interactions, job performance and career prospects (Madden 2014).
Stock (of HWF)	The number of available practising and non-practising health professionals in a country, recorded in a registry or database. Ideally the number is expressed in headcount and in full-time equivalent (FTE).
Sustainability	Viable and/or capable of working successfully in the long term (referring to IT aspects, longstanding traditions and support for ensuring the operation of data collection).
Time horizon	The time span used for analysing resource usage, effectiveness, outcomes, utilities or the quality of life that can be expected or has been substantiated. (Schulenburg et al. 2008).
Triangulation	Triangulation is a powerful technique that facilitates the validation of data through cross-verification from two or more sources. In particular, it refers to the application and combination of several research methods in the study of the same phenomenon. By combining multiple observers, theories, methods and empirical materials, researchers hope to overcome the weaknesses or intrinsic biases and problems that come from single method, single-observer and single-theory studies (Bogdan, Biklen 2006, Rothbauer, 2008).
Universal coverage	A healthcare system that provides effective, high quality and free of expense preventive, curative, rehabilitative and palliative health services to all citizens, regardless of socioeconomic status, and without discrimination (WP2 Glossary).
Unmet need	Foregoing any type of care because it was not available or not easily accessible. Examples are where the individual could not afford care, or was unable to receive it due to waiting lists and travel-related problems. Additionally, if an individual waited to see if the problem improved on its own, did not know a good doctor, possessed a fear of care, or could not take time off from work (Allin & Masseria, 2009).

Abbreviations

CPD	Continuous Professional Development
D	Deliverable
EC	European Commission
ECAB	European Cross-border Care Collaborations
ECHI	European Core Health Indicator (previously called European Community Health Indicator)
ECHIM project	European Community Health Indicator Monitoring Project
EU	European Union
FTE	Full-time equivalent, Whole-time equivalent
Health PROMeTHEUS	Health Professional Mobility in the European Union study
HP	Health Professionals
HRH	Human Resources for Health
HWF	Health Workforce
JA	Joint Action on European Health Workforce Planning and Forecasting
LTP	Licensed to practice health professional
M	Mean
MD	Medical Doctor
MPDR	Minimum Planning Data Requirements D051
MoHPRof	Mobility of Health Professionals. Health systems, work conditions, patterns of health workers' mobility and implications for policy makers.
MS	Member State/s
P	Practising health professional
PA	Professionally Active health professional
R	Recommendation
RN4cast	Registered Nurse Forecasting study
WHO	World Health Organisation
WP	Work Package
WS	Workshop

Executive summary

Health workforce (HWF) planning is a complex activity and is ultimately intended to ensure the appropriate number of HWF for delivering healthcare and supporting the sustainability of the healthcare system. Different levels, stages and actions taken can be observed across various EU Member States (MS) in terms of HWF planning processes and HWF data.

The objective of this report is:

- to share knowledge about a selection of HWF planning systems in the EU,
- to support MS in setting up and developing their HWF planning systems,
- to provide a gap analysis for a better understanding of the factors that limit national HWF planning processes and reduce the quality of national HWF planning data,
- to present good practices via a thorough analysis of the availability of HWF planning data, and by underlining the role of data and data management processes in HWF planning,
- to propose practical solutions and a toolkit that can help to overcome gaps and enable data development and management

Key findings

1. HWF planning activities across Member States show that national HWF planning systems can be presented in a **HWF planning development continuum**, in which partially systematic as well as more advanced levels of comprehensive planning systems may be distinguished. **HWF monitoring** was found to be **the most frequent activity** among MS, while each activity (HWF monitoring, forecasting and planning) is most extensively established for medical doctors and much less for other health professions such as dentists, pharmacists, midwives and nurses. Most of the countries responded that a **high feasibility for enhancement/development possibilities** exists regarding their current HWF planning.

2. The planning process can be described with a flow chart designed by WP4, which highlights the crucial elements and steps of **HWF planning data-related processes** that could contribute to an increase in data quality. A **gap analysis** was conducted to reveal the most acute gaps, which were found to **limit accessing, managing and utilisation** of appropriate data. The most important difficulty occurring in several countries was the lack of resources. Countries indicated that **human, financial and technical resources should be dedicated** permanently to the field of HWF planning. Sometimes, the complicated structures of national HWF planning systems burden the operation, where information failures can be frequently experienced. The lack of clarity with respect to the responsibilities of different actors/stakeholders was also underlined by respondents as important risk factors. These problems in data management can significantly influence data quality and HWF planning.

3. During the gap analysis, crucial issues reported concerning HWF planning data gaps were the **non-availability of data, the lack of valid and reliable data, and the lack, misuse of quantitative planning models**. Countries declared that a significant lack of HWF planning data categories can be experienced, since they tend to use existing data for HWF planning, and thus frequently do not have the data in the required format. Furthermore, **the lack of utilisation of qualitative approaches** in HWF planning was mentioned, which was underlined by countries performing more systematic HWF planning. An availability gap analysis was carried out on Minimum Planning Data Requirements (D051 report), where as a common factor **the lack of mobility data and precise indicators** was mentioned in most of the examined MS. These analyses provide an overview of the critical points of data components and elements that highly affect HWF planning data quality.

Key solutions and tools in overcoming identified gaps

Addressing the barriers seems feasible and although most of the countries consider them difficult to solve, **no everlasting gaps were experienced and identified**. To mitigate the influence of the limiting factors in HWF planning, the HWF planning process and data gaps were grouped, and four **typical gap groups** were created:

- Difficulties in national-level collaborations,
- Methodological challenges,
- State of data, and
- Qualitative approaches.

For addressing the identified gap groups a set of recommendations were formulated focussing on revising and improving HWF planning processes, on HWF planning - quantitative and qualitative - data development and on HWF planning evaluation.

Recommendations to Member States for overcoming gaps in national level collaborations, aiming to clarify and self-evaluate the level, status of HWF planning in the given country, and support testing of the preconditions and processes:

- follow **minimal common guiding steps** for a feasible and achievable HWF planning process,
- use a measurement instrument for listing the **objective criteria** of systematic HWF planning in order to facilitate self-evaluation and reveal areas for improvement and/or expansion.
- dedicate special attention to **information flow and communication management**,
- invest in human, financial, infrastructural, technical, skill-related HWF planning **resources** and revise them regularly
- set up a **designated responsible entity**, a HWF Planning Committee/authority - proposed together with its possible composition - at the national, Member State level in order to strengthen national-level collaborations
- foster **stakeholder-involvement** for the successful development of the planning process, including the support of EU level professional organisations.

Recommendations to Member States for overcoming gaps in HWF planning data and methodology concerning quantitative and qualitative data, - focussing on different aspects of increasing data quality and development of data collections:

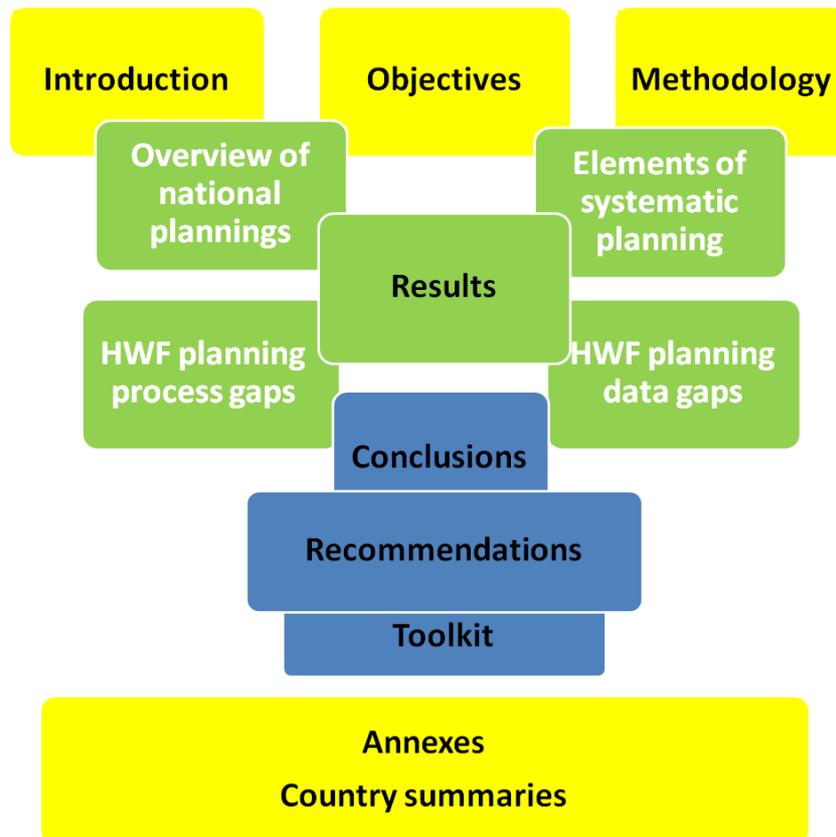
- ensure and increase **data quality**
- **improve** data collection, sharing, and management
- prevent inappropriate health policy actions based on the misinterpretation or misuse of data and the lack of updates and real-time databases should be prevented and therefore the danger of bias should be considered
- utilise **estimates** based on quantitative and qualitative data in the continuous situation analysis, trend analysis and environment scan
- incorporate **big data and e-health solutions** to enable more efficient HWF planning data gathering and data linking, utilise interoperable and comparable datasets
- revise objectives in data collections, and consider the three-level continuum of objectives in HWF planning
- **utilise qualitative methodology**, qualitative data collections to enable deeper analysis and understanding of quantitative data in HWF planning
- **evaluate HWF planning on a regular basis** to ensure continuous improvement.

Besides targeted recommendations, a “**Toolkit on HWF planning**” was designed to find possible solutions and to overcome the reported difficulties. The Toolkit as a practical collection of tools addresses topics of major importance in HWF planning, namely, the preconditions of planning, the HWF planning processes and the HWF planning data. The tools focus on identifying bottlenecks and key components in HWF planning, in which the tools help to understand the current situation of a MS and **draw attention to possible points for improving HWF planning data and related processes**. The tools do not address every situation in detail, but they are adaptable for country environments and facilitate the implementation of minimal steps to enable improvement in HWF planning data and related processes. The toolkit was designed to support performing a self-evaluation at first, and then provides guiding instructions for health workforce planners to choose the most appropriate tools for their needs.

To conclude, the report provides an overview of the current ongoing actions and gaps in twelve EU MS, in HWF planning processes and data across the EU. However, HWF planning processes and data show significant gaps; each MS should tailor data collections and HWF planning to specific national objectives. The analysis revealed that **data management** processes have a significant influence on HWF planning data quality, thus the development of the processes and the data itself should be aligned. HWF planning processes should be examined and developed besides data, since bias might occur due to process gaps. The recommendations of the report and a newly designed Toolkit can contribute to **self-evaluation** and focussed attention towards **improvement directions** in order to foster systematic HWF planning in the EU Member States. Thus, not only data but also data management should be considered when closing the gaps for developing HWF planning in the long run.

Structure of the report

The first chapter is the Introduction focusing on the context of this report. The second chapter summarises the main objectives, while the third chapter explains the methodology of the report. The fourth chapter presents the results, first providing an overview on national HWF planning systems, then discussing the main elements of systematic HWF planning. Among the findings, the gaps in HWF planning process and data are presented. The conclusions discuss the lessons to be learnt from the results. The report indicates recommendations and linked tools to overcome gaps, so the “Toolkit on Health Workforce Planning” is displayed at the end of the document. For detailed country information, country summaries were placed into the Annexes. Please, switch to colour printing when reading the report, since fixed colour codes are used throughout the document.



1. Introduction

The operation of health systems highly relies on the human resources of the health sector (Dubois et al., 2006). This sector is labour intensive and the labour force is highly mobile, thus policy measures on health workforce (HWF) issues should particularly focus on the changes and development of HWF in all EU Member States (MS) (EC 2012). Planning intentions, design, implementation and assessment are considered to be crucial for health policy and in practice. Every country has its own HWF capacity that is measurable, however, determining the necessary resources, quantifying the demand or the continuous evaluation and assessment is challenging or even often lacking (WHO 2010).¹ Therefore, evidence-based policy interventions require the continuous development of data collections. In HWF planning,² countries tend to focus first on existing domestic human resources and secondly on future needs for ensuring the operation of the domestic healthcare system. Another significant field in HWF planning development is the highly qualified HWF, where the skill sets and competences of the HWF as well as continuously evolving competences are taken into consideration (Bourgeault et al. 2008, EC 2013, HOPE 2004, Kuhlmann et al. 2015, Ling & Belcher 2014, Ono et al. 2013; cf. D062). This covers revising and updating the curricula in different health professions and developing educational content. Moreover, changes to healthcare provisions (e.g. new care patterns and guidelines, new professional roles, new treatments and therapies and the effect of technical development that might amend practice thus modifying skills and competences) should also be monitored or taken into account during the planning stage (Dal Poz et al. 2009, Munros team 2015, WHO 2013).

Furthermore, several external factors influence the daily scope of practice by health professionals (e.g., ageing, feminisation, demanding working conditions, economic situation of the given country). All aspects of this complex picture should be examined in order to have a clear understanding of the operation, changes and challenges of the HWF (Batenburg 2015, Dussault et al. 2010, WHO 2010). This means that health workforce planning is a complex process and the factors to be built into the planning should be chosen carefully knowing that it is hardly possible to take every factor into account.

¹ It is even a challenge at the international level.

² Often used as human resource planning or manpower planning.

2. Objectives

This report - as the first strategic objective (S1) - aims to **share knowledge** on HWF planning in different EU MS (Table 1). National HWF planning practices and national or EU-level action plans (EC 2012) were investigated in order to gain deeper insight into national HWF planning systems. The identification of practical issues and limitations that emerge during the setup, implementation and improvement of national HWF planning can effectively **support MS in setting up and developing their own HWF planning systems (S2)**.

<i>Strategic objectives of this Report</i>	
S1	Share knowledge between EU Member States and other European countries
S2	Support Member States in building up and developing their own data collections to support HWF planning systems
<i>Operational objectives of this Report</i>	
O1	Identification of the factors diminishing/undermining national HWF planning processes and which influence data quality: data collection, data reporting, data management, data flows
O2	Identification of the factors reducing/hindering the quality of national HWF planning data : data sources, datasets, data categories, methodology
O3	Provide a better understanding of the gaps between data MS currently collect or use in HWF planning and data MS should have available for proper HWF planning at the national level
O4	Present available good practices of HWF planning data collections
O5	Propose practical tools that can be easily utilised and tailored to a given MS situation in order to enable HWF planning development

Table 1 - Objectives of the report

In terms of the operational objectives (Table 1), the report focuses on revealing barriers and critical points in HWF planning in the **12 EU MS** participating in this activity;³ and attempts to reveal crucial factors that can reduce or weaken data quality in HWF planning.

³ Activity 3 of WP4 focussed on HWF planning data as the third and last part of WP4 work in the JA.



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Therefore, we concentrated on barriers concerning both:

- Processes (e.g., data collection, data reporting, data management, data flows) of HWF planning (cf. O1) and
- Data (e.g., data sources, datasets, data categories, methodology) available for HWF planning (cf. O2).

In addition, the application of HWF planning in terms of daily practice and scope (including quantitative and qualitative methods) was analysed. Therefore, the third operational objective (O3) of the report was to provide a better understanding by MS of the gaps between data that they currently collect in HWF planning, and data that MS should have available for proper HWF planning at the national level.

This report aims to collect MS-level information already published or available in grey literature. Literature and evidence were summarised, and existing data collections were revealed that support comprehensive and systematic HWF planning. Country summaries were prepared to present practices in HWF planning processes and data (O4). Finally, after identifying typical gaps frequently experienced by MS, the present report intends to provide several practical solutions and tools in order to overcome difficulties and to enable HWF planning development (O5).



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3. Methodology

As a starting point of the analysis, a **work hypothesis** was set, which distinguishes countries according to the stage of HWF planning development. Different levels, stages and actions taken can be observed in different EU Member States (cf. D052), based on which MS practices can be placed into the so-called HWF planning development continuum. The HWF planning development continuum refers to the distribution, sequence of countries that achieve various levels in systematic actions. One end of the continuum starts with the **non-systematic or partially systematic** use of elements in HWF monitoring, forecasting and planning with ongoing actions. These focus on clear HWF planning objectives and HWF databases and data collections in different countries. These elements usually tend to be further developed towards systematic, proper⁴ and comprehensive HWF planning. Many countries make the effort to initiate and **realise** systematic HWF planning by **implementing** projects, interventions and tangible steps.⁵ On the other end of the continuum, we can observe countries that possess **established systematic** HWF planning systems.⁶ Naturally, each phase of the continuum could be developed further through careful assessment, continuous evaluation and improvement of HWF planning on a regular basis.

Concerning systematic, proper and comprehensive HWF planning, we prefer having established (documented and recorded, not historical/anecdotal) planning systems, where the planning methodology is established and methods for HWF planning are applied.⁷

HWF planning continuum was used as a hypothesis throughout the report and it is also referred in the discussions on gaps, problems and solutions (Figure 1).

⁴ Even these often remain fairly traditional and focus on demographic trends to assess the future supply and demand for doctors and nurses. Other variables that can be expected to have an impact on future health workforce requirements, such as health professionals' retention and retirement patterns and health expenditure projections, are barely taken into account.

⁵ Two Pilot projects were initiated in Italy and Portugal within the scope of the JA.

⁶ The use of the expression "proper HWF planning" comes from the Grant Agreement. WP4 does not suggest that there is only one correct form of planning. Systematic, proper and comprehensive are used interchangeably.

⁷ However, the assessment and the evaluation of systematic HWF Planning systems is a methodological challenge indeed (cf. Ono et al. 2013, D051, D052).

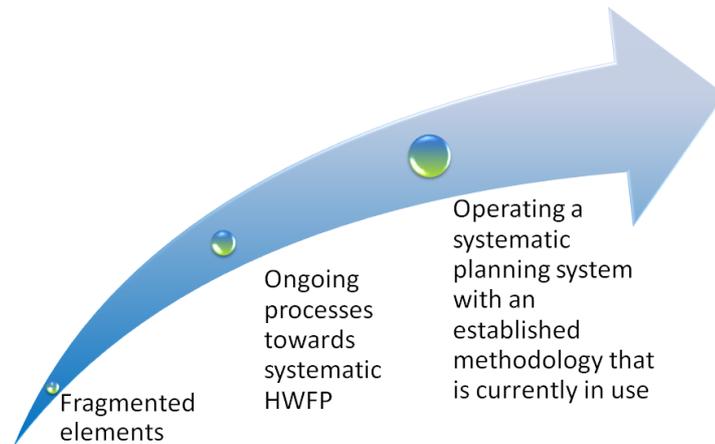


Figure 1 - HWF planning development continuum

The report used a **problem-based approach** (Barrows, Tamblyn 1980), which provides a unique opportunity for learning from experience. Problem-based thinking is considered an active learning-centred process of the investigation of any real-world problem. This approach is driven by open-ended, context-specific problems and discovers meaningful solutions. Its core lies in collaboration, personal reflection and teamwork. The methods, particularly workshops used problem-based approach.

3.1. Literature review

The literature review was conducted by the WP4 team in the first period of the JA. WP4 experts on Human Resources for Health (HRH) identified and suggested the **main relevant HWF projects** from the previous decades. As a first step, key projects, policy documents, research papers, reports and books were analysed with regards to HWF planning. The inclusion criteria were set to include European projects focusing on the health workforce and mobility fields. The following project documents were thus summarised: EC Feasibility Study, Mobility of Health Professionals (MoHProf), RN4Cast, Health Prometheus, and Evaluating Care Across Borders - European Union Cross Border Care Collaborations (ECAB). After collecting the relevant bibliography (based on a common framework) summary table sheets and text documents were used in order to summarise HWF planning-relevant evidence. Later on, additional project documents were taken into account: Migración de Profesionales de Salud (MPDC), European Community Health Indicators Monitoring (ECHIM), Capacity projects, and Health Care Reform: The impact on practice, outcomes and costs of new roles for health professionals (MUNROS). Furthermore, this literature review process was completed through additional **advanced desk research** where further HWF planning-relevant literature was considered in the 12 countries after searching databases (PubMed, Scopus, ProQuest, Sciedirect) by using the keywords "health workforce" AND "country", "health workforce" AND

"data" AND "country", "health workforce" AND "planning" AND "country", and "HRH" AND "planning" AND "country" after 1990.

During the working process, an additional literature review was conducted of the other **core WPs of the Joint Action** (WP5-WP6). All working materials, draft documents (i.e., country templates, survey content, draft reports, meeting materials, pilot project descriptions and results) and newly published Joint Action approved materials were carefully checked, synthesised and taken into account when preparing this report. During the literature review, limitations, difficulties and gaps received particular attention. Drawing on the baseline analysis of the literature, the research questions were specified, the research hypothesis was defined and the synthesised information was used in the further applied methods.

3.2. Joint Action Events

Several workshops (WSs) were carried out during the JA⁸ that provided: dialogue in groups, processing of experiences and reflections, team decision-making, explanation of prior country knowledge, active discussions and multiple ways of understanding viewpoints. Knowledge construction, exchanging ideas and collaboration are key elements in the problem-based approach. The results of the workshop discussions were considered in a **qualitative-thematic analysis** (Cassel, Symon 2004). All JA WSs contributed to the formulation of the thinking path for this report. WP4 conducted qualitative-thematic content analysis. Regarding the main topics of the WSs, the following items can be listed: HWF terminology, data collections, mobility trends and HWF planning data (Budapest, Bratislava, Utrecht, Lisbon, Rome), Minimum Planning Data Requirements (Milan), good practices in HWF planning (Florence, Turin), and the skills and competencies of the HWF (London). A separate evaluation-validation WS on critical issues with respect to HWF planning was organised in Budapest. The validation of data and country-level information on the topic of significant difficulties in HWF planning was completed through cross-verification from more sources. Finally, a consultative Expert Meeting was held in Iceland with MS representatives to discuss the proposed solutions for overcoming gaps and to formulate recommendations. Participants tested the WP4 Toolkit in Reykjavík.

3.3. WP4 D043 Country Templates focusing on gaps

A brief questionnaire survey was used to explore the MS-level situation regarding HWF planning potentials and difficulties. Following up on the latest changes or developments and to complete the information, WP4 partners were asked to provide a quick overview about national Health Workforce Planning - concerning both **processes** (e.g., data collection, data reporting, data

⁸ See the Joint Action website for more detailed information on the workshops: <http://healthworkforce.eu/>

management, data flows) of HWF planning and **data** (e.g., data sources, datasets, data collection methodology) available for HWF planning.

The objective was to reveal and understand:

- the systematic use of elements of HWF planning (data and process-related),
- the current practical problems and critical points in national-level HWF planning,
- the feasibility of the development, sustainability and availability of national HWF planning.

In total, 12 country responses were received and taken into consideration when preparing the report: Belgium, Finland, Germany, Greece, Hungary, Iceland, Italy, Poland, Portugal, Slovakia, Spain, and the Netherlands.⁹ The Country Template focused on nine core questions regarding current experiences with difficulties in HWF Planning. For validation of the information provided in the questionnaire, a clarification process was carried out. Remarks and comments from the WP4 team members were discussed with the partners in written communication and/or phone conversations in order to understand the country situation.

3.4. Secondary analysis

An extended clarification round was carried out regarding the Minimum Planning Data Requirements (MPDR), where details on the availability (and unavailability/non-availability) of data categories were in focus. For the MPDR gap analysis, a **secondary analysis** was carried out based on the WP5 templates, where the clarification rounds with WP4 partners resulted in the clarification of availability in different data areas, dimensions and categories in the given country.

Twelve Country Summaries were prepared (see Annex IV.) based on the Literature review, draft materials, secondary analysis and the WP4 D043 Country Templates, providing a synthesis of the current knowledge of different countries. These summaries were also revised and confirmed by the WP4 partners.

3.5. Limitations

The findings summarised in this report rely on the information gathered from WS and meeting discussions, literature reviews, WP4 Country Templates, and secondary analysis. Although the triangulation of data was performed and the problem-based approach provided a comprehensive overview of the EU situation, there may be several additional aspects not considered in this text. The widespread utilisation of different methods could provide the possibility of learning experiences

⁹ The 12 participating MS are the WP4 partners that showed interest in being involved in Activity 3 on HWF planning data.

and a variety of opinions from several country experts and representatives. Countries from both Western and Eastern Europe were involved, however, the number of partners involved in the activity did not reach the total number of participating EU/EEA countries and cannot provide a representative picture for Europe.

4. Results

4.1. Overview of national HWF planning activities across Member States

Current national HWF planning practices were reviewed in order to provide a comprehensive overview of the prevalence of HWF planning activities in 12 EU Member States¹⁰.

In the D043 Country Template, the following definitions were used (Table 2):

<i>Definitions of HWF Planning activities</i>	
1	Health workforce monitoring: performing analysis on the current situation and aiming to respond to the challenges posed by the current situation (D052).
2	Health workforce forecasting: predicting the required health workforce to meet future health service requirements and developing strategies to meet those requirements (D052)
3	Health workforce planning: ensuring that the right number and type of health human resources are available to deliver the right services to the right people at the right time (D052).

Table 2 - Definitions of HWF planning activities

In the JA, HWF planning covers all activities conducted in HWF monitoring, forecasting and planning (Table 2). This might show the maturity level of systematic HWF planning.¹¹ HWF monitoring as a basic HWF planning activity carries out regular environmental scans and evaluations, views HWF trends retrospectively. HWF forecasting occurs when HWF monitoring is needed to reinforce projections for the future. HWF planning refers to complex, more developed activities including interventions on influencing the supply.¹²

¹⁰ Analysis based on 12 participating WP4 D043 Country Templates and WP5-WP6 draft materials and documents.

¹¹ This is also in line with the HWF planning development continuum.

¹² Not surprisingly, due to the richness of different languages, these definitions are used interchangeably. The terminology is often used inconsistently. In regards to the abovementioned definitions, an attempt at clarification was sought.

Stages and activities in this development process were investigated. The findings showed that **HWF monitoring is the most frequent activity**, followed by planning and forecasting. Table 3 presents the different distribution of HWF monitoring, forecasting and planning activities in the five sectoral health professions at the MS level. The analysis showed that **all (12 participating) countries monitor the medical doctor and nursing workforce**. The third most frequently monitored profession was **midwives**, but in several countries this profession is not distinct from the nursing professional group.¹³ In addition to these professions, the HWF monitoring of **dentists and pharmacists** is also quite frequent. In summary, monitoring activities take place in each country of our sample and for almost all of the five sectoral professions.

	Doctors	Dentists	Nurses	Midwives	Pharmacists
HWF monitoring	12	9	12	11	10
HWF forecasting	9	6	5	5	4
HWF planning	8	6	6	5	6

Table 3 Prevalence of HWF planning activities in 12 MS

Not surprisingly, countries indicated that **workforce forecasting and planning** are the most frequent in the profession of **medical doctors**. From the responses, it can be stated that - corresponding with the previous literature - HWF forecasting for the pharmacist profession and HWF forecasting and planning for midwife activities are the least frequent. It is worth mentioning that MSs often plan and forecast based on pharmacies, not directly on the number of pharmacists.

Health Profession	Mean (4 point scale)
Doctors	3.5
Dentists	3.3
Nurses	3.3
Midwives	3.1
Pharmacists	2.5

Table 4 - Enhancement possibilities of HWF planning activities

¹³ See the D041 Terminology gap analysis for further details.

During the investigation of **enhancement/development possibilities**,¹⁴ respondents were asked to assess the feasibility of having/enhancing national HWF planning activities to adapt the supply to the varieties of demand in their country in a four point Likert-type scale (Table 4). According to the responses, the professions that currently have the less developed planning also have the fewest possibilities for enhancement. The HWF planning of **medical doctors** is the most feasible for enhancement, with a mean value of 3.5, followed by **nurses** (3.3), **dentists** (3.3) and **midwives** (3.1). For **pharmacists**, HWF planning seems to be the least feasible with a 2.5 mean value. These values mirror a promising situation for developing the current systems and increasing the level of maturity of systematic planning.

4.2. Essential elements of systematic and comprehensive HWF planning

Country experiences (both strengths and weaknesses) and practices are summarised in this chapter¹⁵ with regards to the hypothesis of the HWF planning development continuum. Having reviewed the country practices, it can be stated that countries in different stage of the continuum **focus on different activities regarding HWF planning**. Countries with fragmented elements that are on the path “towards systematic HWF planning” tend to aim to develop data collections, address planning at the policy level and make significant efforts to initiate and realise systematic, proper and comprehensive HWF planning, focusing on the different stages of the development line of HWF planning, i.e. HWF monitoring, forecasting and planning systems. The other end of the HWF planning continuum relates to countries where formal, documented and established methodologies exist with an operating, systematic, advanced-level HWF planning system.¹⁶

4.2.1. HWF planning across Member States: strengths and weaknesses

In the next step of the analysis, the main strengths and weaknesses were identified. Member States underlined several important factors that strengthen or weaken the operation of HWF planning systems (Figure 2-3). The main factors involved both process and data aspects among the strengths and weaknesses. Countries with more systematic HWF planning reported several strengths, steps and elements that might be useful for countries in order to improve and customise their HWF planning systems (Figure 2).

¹⁴ See question 2 in the WP4 D043 Country Template: How do you rate the feasibility of having/enhancing **national HWF planning to adapt the supply to the variations of demand** in your country?

¹⁵ A detailed description of the separate country situations can be found in the Country Summaries section in the Annex.

¹⁶ It is important to note that the HWF planning continuum does not enable precise comparative cross-country analysis.

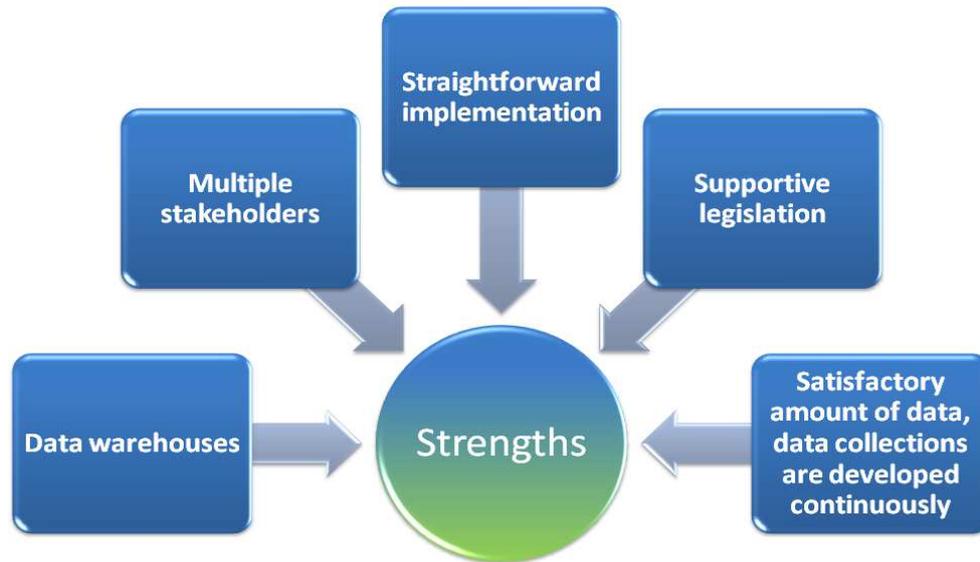


Figure 2 - Strengths experienced by MS

Countries with less systematic HWF planning reported several weaknesses that cause barriers in their HWF planning systems (Figure 3). Identifying weaknesses in the operation of HWF planning is one of the most important actions, since the awareness of the critical points can notify HWF planners about necessary interventions.

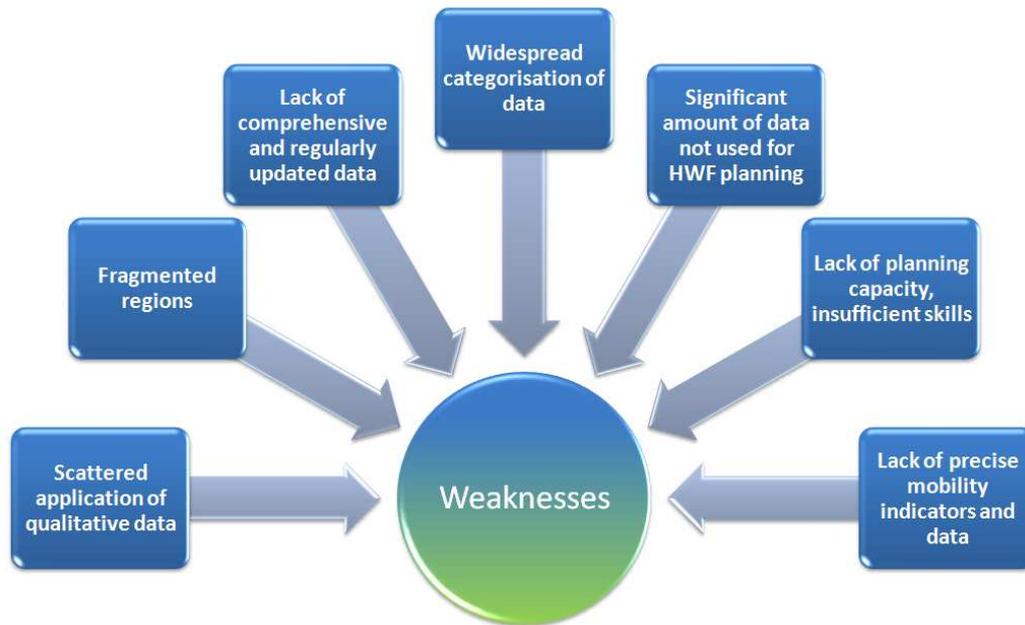


Figure 3 - Weaknesses experienced by MS

Figure 4 shows that the most advantageous factor in the majority of MS with respect to HWF planning is the high-level involvement and collaboration of multiple stakeholders (sometimes even multisectoral cooperation). With regards to data, such as integrated and interlinked data sources and data warehouses, a satisfactory amount of existing data and continuous development of data collections were reported, however, a significant amount of data are not used for HWF planning, and their comprehensiveness, coherence and consistency may be doubtful. Legislation can support and limit HWF planning at the same time. Some countries emphasised the importance of codified laws on HWF planning and data collections, and the strong link between policy and implementation, however, slow bureaucratic processes restrict operations. Countries with territorial fragmentation struggle with unclear HWF planning structures, while the lack of planning capacity and resources could also be experienced. In terms of data, the lack of precise mobility indicators and gaps in the use of mobility data were stressed by all 12 countries as one of the most challenging areas.¹⁷ Finally, countries with more systematic HWF planning underlined their intention to use qualitative methods more systematically in combination with existing quantitative methods. The analysis performed and the findings capture and confirm the HWF planning development continuum.

¹⁷ See D042 for the Report on mobility data in the EU.

	Slovakia, Greece	Iceland, Hungary, Portugal, Poland, Italy	Germany, Spain	The Netherlands, Finland, Belgium
strengths	Satisfactory amount of data, data collections are developed continuously		Multiple stakeholders	Datawarehouse
	Supportive legislation			Straightforward implementation
weakness	Lack of financial resources and policy tools	Slow procedures in legislation		Scattered application of qualitative data
				Fragmented regions
		Widespread categorisation of data	Lack of comprehensive and regularly updated data	
		Significant amount of data not used for health workforce planning		
			Lack of planning capacity, insufficient skills	
		Lack of precise mobility indicators and data		

Figure 4 - Strengths and weaknesses by countries

4.2.2. List of essential elements of systematic HWF planning

Based on the country experiences collected,¹⁸ steps and elements can be recognised that might be useful for countries in order to improve and customise their HWF planning systems, therefore support policy objectives (i.e. patient safety, equal access to care etc.). As **system features**, the main elements of systematic, advanced level, and comprehensive HWF planning are:

1. extended attention to and awareness of the topic of HWF planning at the policy/political level,
2. setting up clear and explicit goals and commitment to the goals,
3. incorporating experiences and traditions with a long-standing presence in the policy agenda,
4. a dedicated group with high-level stakeholder involvement and commitment to HWF planning,
5. a proper and adequate communication flow,

¹⁸ This chapter takes also into account all JA approved reports (particularly D051 and D052) and draft materials of all core WPs. In addition, this chapter relies on D052 good practices and provides more detailed, deeper understanding on the system features and elements of systematic HWF planning.

6. support of online platforms and IT solutions or a health information system,
7. clarity of the current country situation,
8. excellent data coverage and quantitative models,
9. easy data source linking,
10. mostly individual (not solely aggregated), but anonymous datasets,¹⁹
11. implementation linked to policy actions,
12. evaluation and maintenance of established and sustainable systems, and
13. human, technical and financial resources ensured.

4.2.3. Country clusters on the HWF planning continuum

Based on the analyses, the findings resulted in two country clusters (Figure 5). **Cluster 1) Systematic HWF planning - might be characterised as extended HWF planning systems** (presented by blue colour on Figure 5). Available information and self-reporting suggest that Belgium, Finland and the Netherlands may achieve the most comprehensive HWF planning from the 12 countries involved in the analysis. These countries report high political commitment and tend to implement directives and policies quite efficiently, viewing HWF planning as a tool for strengthening the HWF. These countries possess broad datasets and rarely encounter a lack of data. Although mobility indicators are hard to produce, their basic problems revolve around the **details and the refinement** of HWF planning data. Germany and Spain have operating HWF planning systems that are systematically built to a certain extent. Moreover, they claim to anticipate their future HWF since they possess clearly set goals.

All other countries form **Cluster 2) Towards systematic HWF planning, where HWF planning is being gradually developed** (presented by green colour on Figure 5). We can find various actions from a simpler to a more complex form in these MS. All of these countries, however, carry out projects and steps that contribute to appropriately operating HWF planning. Countries with less systematic HWF planning concentrate on the quantitative steps of HWF monitoring while strategic HWF planning is still incomplete or under development, cf. Iceland, Hungary, Poland, Italy, Portugal, Slovakia and Greece. Usually, countries in this cluster have systematic HWF monitoring systems and/or data collections with partially systematic HWF planning mechanisms to various extents. In this second cluster, the most critical points relate to the need for a **comprehensive strategy**, or the blurred lines of **systematically advanced** and promoted processes. These processes significantly influence the consistent line of actions and therefore affect continuous and tangible implementation. No fragmented elements were recognised, each of the investigated twelve countries carries out partially systematic HWF planning mechanisms.

¹⁹ This must comply with the necessary data security and privacy regulations.



Figure 5 - Country clusters

All countries in the analysis aim to build policies for strengthening the HWF in line with HWF planning purposes (cf. national recruitment and retention strategies). For further consideration, an objective, elementary self-evaluation assessment method would support national improvements and strengthen the **effectiveness of HWF planning**.²⁰

²⁰ As regards the extent to which the objectives, principles and materials have influenced actions and policies concerning HWF strengthening (such as those related to information systems, planning, education and retention strategies) at the MS level.

4.3. Main steps and gaps of HWF planning processes

At the starting point of the analysis on possible improvements of HWF planning processes, a flow chart was prepared to represent the main steps of HWF planning activities (Figure 6).²¹ All significant items in the process were considered, e.g. data collection, data flows and data management that influence data quality and contribute to improved HWF planning data.

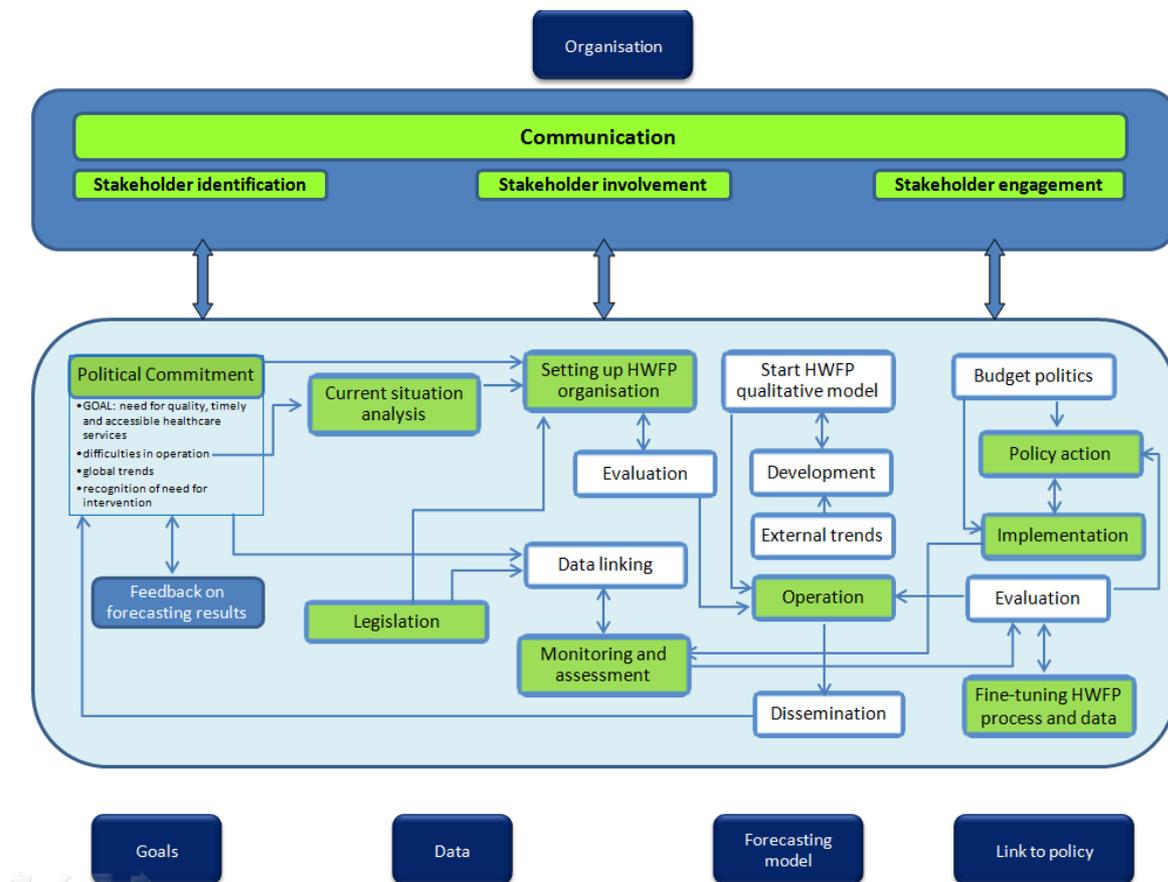


Figure 6 - Flowchart on HWF planning processes

The flowchart points out some essential steps and elements that highly affect HWF planning data, or more specifically HWF planning data management. All steps (boxes) on the flowchart contribute to higher quality planning data for proper and systematic HWF planning. The flowchart

²¹ Based on the available literature, JA materials (draft and finalised, approved), particularly D041-D042, D051-D052, D061 and previous WS outcomes a flow chart was prepared by the WP4 team. Considering the five key elements suggested by D052 (see dark blue cells), we identified a “starting-point” where the HWF planning process can be drawn with the main steps that influence HWF planning data.

provides evidence on the process of systematic HWF planning that can be useful for decision makers when preparing policy actions.

One crucial issue in the HWF planning process is the need to obtain **political commitment** that provides the authority to intervene and implement actions in order to ensure high-quality, timely and accessible healthcare services for the population. Global trends influence service-provision and the dynamics of the HWF may cause difficulties in operations, which could lead to recognition of the need for intervention. The **current situation analysis box** includes data management processes, the collection of HWF data (also data collected for different purposes), the analysis of the current HWF situation and calculations on the imbalances. This is linked to the daily **operation** of HWF planning systems and the **monitoring and assessment box**, which ideally performs a continuous evaluation of existing systems. The latter step may influence the **fine-tuning** of elements in HWF planning, thus the experiences gained from **implementation** may necessitate **policy actions**. One important step is **setting up a designated group** that is responsible for HWF planning, which might require changes in **legislation**. Furthermore, several steps play significant roles in the HWF planning process, such as data linking, disseminating findings and incorporating qualitative HWF planning data.²²

Table 5 demonstrates the aggregated ranking of WP4 partner countries on how frequently they face the various difficulties and limitations (in total 9 barriers²³) in relation to the **HWF planning process**. Arithmetical means and weighted **frequency scores** were calculated to examine HWF planning gaps. For each factor, the score of the frequency category (a four point Likert scale where 0='never' and 4='regular' occurrence) was multiplied by the number of countries that selected the given frequency, with these frequency scores then computed for each factor. To explore the impact of these difficulties, respondents were also asked to rank the top three difficulties in terms of the HWF planning process at the national level. When computing the **impact scores** of the factors: three scores were given for 1st rank, two scores for 2nd rank and one additional score for 3rd rank. Analysing the lists of frequency and impact scores together, the two methods reveal the most important gaps in the process.

Top limitation factors identified		Weighted frequency score	Mean	Weighted impact score
1	Lack of resources (e.g. financial, HR)	28	3.3	13
2	No tracking of shortages and surplus of HWF (e.g. role of HWF mobility)	26	3.2	13
3	Level of planning: complicated regional and/or	24	3.0	11

²² All of the listed steps are investigated in this report, and are based particularly on the predefined lists of barriers and limitations mentioned in the WP4 D043 Country Templates and the preliminary findings of the Rome Workshop in December 2014.

²³ Lists derived from WP4 D043 Country Templates (Questions 5 and 9).

	national, not a structured planning system			
4	Unclear roles of actors and shared responsibilities	19	2.5	8
5	No consideration of the supply and demand sides in HWF planning (e.g. training, educational places not considered in the long term)	18	2.6	7
6	Information flow failures: institutional involvement, coordination difficulties	18	2.5	5
7	Lack of collaboration at EU/international level	15	2.3	6
8	Low level of stakeholder engagement: convincing decision-makers faces difficulties	12	2.0	3
9	National legislation, regulation-related difficulties (mandatory vs. voluntary) ²⁴	9	1.8	2

Table 5 - Gaps in HWF planning processes²⁵

As the table demonstrated, there is a strong overlap between the impact and the frequency of the factors that significantly hinder systematic and comprehensive HWF planning processes. Therefore, the **most fundamental barriers** Member States often face regarding the HWF planning process were identified as follows:

1. Lack of resources (e.g. financial, HR),
2. No tracking of shortages and surplus of HWF (e.g. role of HWF mobility),
3. Complicated or not structured HWF planning,
4. Unclear roles of actors and shared responsibilities,
5. No consideration of the supply and demand sides in HWF planning, and
6. Information flow failures (Table 5).

Figure 7 shows the gaps we found that may limit the flow of HWF planning processes, which influence HWF planning data quality (marked in red). The abovementioned critical points completely fit into the steps of the flow chart with the red spots showing the barriers. *“Lack of*

²⁴ The regulation-related issues (e.g. mandatory vs. voluntary registrations systems in the national legislation) can significantly influence the planning process, for example setting up the HWF planning organisation and data linking possibilities.

²⁵ See the more detailed format in the Annex 1.

resources” can be marked between the Budget politics and Implementation boxes, “Complicated and/or not structured HWF planning” and “Unclear roles of actors” can be located in the Setting up HWF planning organisation box, and the calculation, methodological and modelling difficulties (“No tracking of shortages and surplus of HWF”, “No consideration of supply and demand sides in HWF planning”) can be presented at the Current Situation analysis box and the Monitoring and Assessment box. Since the findings show that “Information and data flow failures” occur, therefore the Communication and Stakeholder engagement box received a red spot.

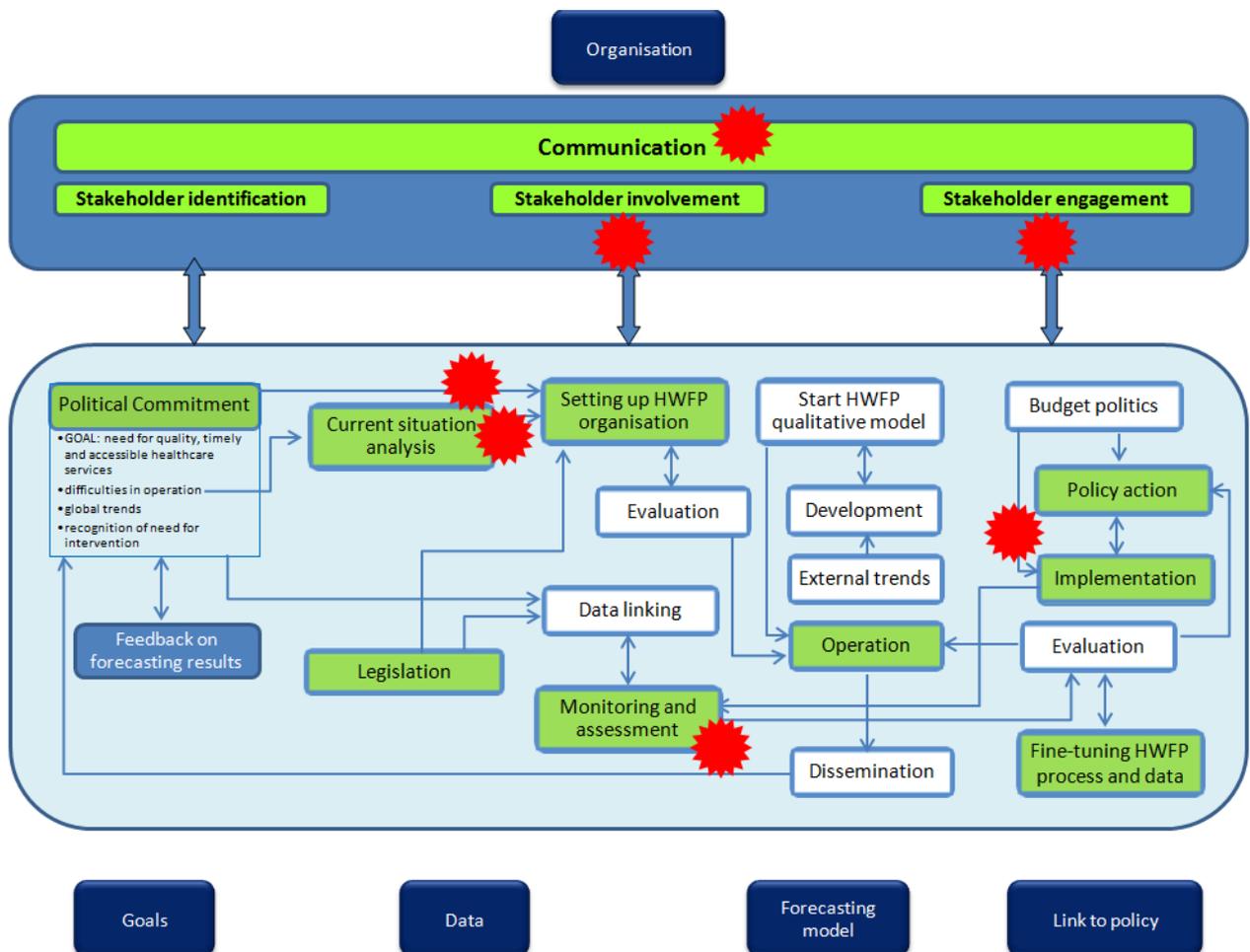


Figure 7 - Flowchart with identified gaps in HWF planning processes

4.4. Data content gaps with respect to the Minimum Planning Data Requirements

The **Minimum Planning Data Requirements (MPDR²⁶)** are a set of data categories crucial for performing national health workforce planning (cf. D051). The MPDR consider "...the key planning indicators and the set of data that are *necessary and sufficient* for basic planning, thought of as a starting point for the countries that need to develop a planning process of Health Workforce." This set of data incorporates 38 data categories, with 32 on the supply side (HWF features) and six on the demand side, representing information on the size and cohorts of the population²⁷ together with their health consumption, which is converted into demand for health professionals.²⁸

The summary of our gap analysis is demonstrated by the HWF planning data gap matrix, an aggregated table (Table 6) of **HWF planning data availability** in the 12 MS examined.²⁹ The table represents the number of countries (out of the total 12) with available data in the given data category visualised according to the red-blue colour scale (where "red=0, not available at all" and "blue=12, available including estimates"). Each cell provides the **number of countries that have reported available data for that data category.**³⁰

The table columns, indicating the availability of different "**Data areas**", provide the numbers where supply-side and demand-side data categories are available: the active practising **labour force**,³¹ those who are in **training**³² or **retiring**,³³ the **migration (inflow³⁴ and outflow³⁵)** of health professionals, and on the demand side the size of the **population** (broken into age groups) and **health consumption** expressed in the age and headcount of the health workforce. The rows provide the "**dimensions of these data areas**" such as: **profession, age, headcount, FTE, geographic area, specialisation, country of first qualification and gender.**

For each data area and data dimensions expressed by the rows, data availability was investigated. Mean values were calculated expressing the average the number of countries reported

²⁶ Frequently used interchangeably with Minimum Data Set - MDS.

²⁷ "Population need" depends on the size of the population stratified by age (age groups) and the age groups' consumption of healthcare, as presented by the D051 Report p. 13-14.

²⁸ "Health production" is expressed by the parameter "k" which "transforms" the demand for health into demand for healthcare professionals, as presented by the D051 Report p. 14.

²⁹ The same data category may rely on different sources across countries and the validity of these sources can also be highly diverse. Furthermore, within individual countries, the depth, validity and the availability of data for different professions or for geographic regions can be different. In addition, while the MPDR shall encompass primary raw data, some countries answered positively on the availability of the specific data categories, even where indicators are solely calculated or estimated. This means that the comparison of the availability and validity of data has limitations, nevertheless it gives a good overview of data available for planning in the EU countries that participated in this research project.

³⁰ Note: We examined the availability of data, not the fact that it is used for HWF planning purposes.

³¹ As defined by the D051 report: the number of health workers currently producing healthcare (practising).

³² As defined by the D051 report: the number of health professionals that complete education (basic or specialist).

³³ As defined by the D051 report: the number of health professionals that will retire each year.

³⁴ As defined by the D051 report: the number of licensed and recognised health professionals that may enter the country.

³⁵ As defined by the D051 report: the number of practising health professionals that may leave the country.

available data in the given data area. Table 6 summarises the average number of countries that reported data available for each data area (columns) and data dimension (rows).

	0	1	2	3	4	5	6	7	8	9	10	11	12
	SUPPLY						DEMAND						
	Data areas	Labour force	Training	Retirement	Migration inflow	Migration outflow	Population	Health consumption					
	Availability - mean	10.1	7.0	7.0	6.0	2.7	10.3	7.7					
Profession	8.6	12	10	9	8	4							
Age	7.1	12	5	7	5	2	11	8					
Head count	8.8	12	10	10	7	4	11	8					
FTE	7.0	7											
Geographic area	6.7	11	6	7	5	2	9	7					
Specialisation	6.6	11	8	6	6	2							
Country of first qualification	3.8	6	3	3	5	2							
Gender	10.0	10											

Table 6 - Gap matrix on data availability

As Table 6 demonstrates, the availability of data for the different MPDR categories showed a complex picture³⁶. **Only three** out of the total 38 data categories were reported to be **available in all 12 countries, resulting in no data gaps**. All of these three categories are within the **labour force supply data area** on the supply side: **profession, age and headcount**. According to the definition,³⁷ the labour force supply data area (M=10.1³⁸) shows data on the “current labour force”: the number of health workers currently providing healthcare services (practising).³⁹ The training and retirement data availability means that on average seven countries reported available data for these data areas.

Furthermore, on the demand side, **population data** (age and size of the population) seem to be easily available (data categories are available in 9-11 countries, M=10.3). Very frequently,

³⁶ The analysis was based on secondary analyses of WP5 templates, WP4 D043 Country Templates completed by country clarification rounds and Country Summaries prepared by summarising different information sources.

³⁷ In the D051 report, p. 12.

³⁸ Not surprisingly, since previous analysis confirmed that a lot of data is available and used for HWF monitoring, thus the first step of HWF planning, that is, the situation analysis seems to be covered satisfactorily.

³⁹ D051 Report, p. 12.

however, they were not utilised in HWF planning. The health consumption data area showed that 7-8 countries were able to provide data in this area.

The least available data categories - the **largest gaps** - are those related to the **Migration-Outflow** data area (geographical area, specialisation, profession, age and headcount). Only 2-4 (M=2.7) countries reported that data is available in these categories, sometimes solely by using estimates or proxy indicators. Despite experiencing the largest gap in Migration data, as 5-8 countries reported that they collect **Migration-Inflow** data based on diverse methods in the different data categories.

When investigating the different data dimensions of the data areas (see rows): the availability of the **Country of first qualification** data reached the lowest level, since only 2-6 countries (M=3.8) reported to have these data. This indicates the gap, which is also linked to migration-mobility issues.

Therefore, we can state that there are still **significant gaps in national data coverage** compared to the MPDR. The least available category gaps (Migration-Outflow and Country of first qualification⁴⁰) should gain a focus in discussions and data collections. Additionally, greater availability and coverage of quality data and proper indicators could support better HWF planning data.

4.5. Significant barriers to HWF planning data

Collecting quality data for national HWF planning may be a **complex and difficult exercise**. Difficulties in the HWF planning process are caused by several barriers that influence data quality: *“Lack of resources (e.g. financial, HR)”*, *“No tracking of shortages and surplus of HWF (e.g. role of HWF mobility)”* and *“Complicated or not structured HWF planning”*. In addition, HWF planning activities have a high dependence on **HWF planning data**, for instance: the availability, the accessibility, the categorisation, the completeness, the comprehensiveness and the timeliness of data. Simultaneously, the interrelation of qualitative and quantitative data and the applied methodology is high. As the previous availability analysis showed (Table 6), significant gaps occur in data availability in terms of minimum planning data. Additional HWF planning data-related gaps are summarised in this section to reveal the areas necessitating intervention.

Table 7 demonstrates the aggregated ranking of WP4 partner countries in regards to how frequently they face the various difficulties (11 items in total) in relation to HWF planning data. Arithmetical means and weighted frequency scores were calculated to examine HWF planning data gaps. For each factor, the score of the frequency category (4 point Likert scale where 0='never' and 4='regular' occurrence) was multiplied by the number of countries that selected the given frequency.

⁴⁰ See the detailed discussion on mobility data and indicators in the D042 Report on Mobility in the EU.

Top limitation factors identified		Weighted frequency score	Mean	Weighted impact score
1	Non-available data (e.g. FTE or Headcount)	26	3.2	13
2	Lack/Misuse of models/methods/data	24	2.9	9
3	No good quality data (validity, reliability)	23	2.9	12
4	No use of qualitative data	23	2.9	9
5	No complementation of quantitative data with qualitative data (lack of triangulation)	23	2.9	5
6	No data source linking	22	2.8	3
7	No exact data but estimates/sample-based data	20	2.7	2
8	No up-to-date data (timeliness)	18	2.3	10
9	No accessible data (privacy)	17	2.4	2
10	No clear definitions for key indicators	16	1.8	7
11	No clear categories (e.g., for specialisation)	9	1.8	1

Table 7 - Gaps in HWF planning data ⁴¹

These **frequency scores** were then computed for each factor. Therefore we can state that the **most fundamental barriers** Member States often face regarding HWF planning data are:

1. Non-availability of data,
2. Lack/Misuse of models/methods/data, and
3. No good quality data (validity, reliability), and
4. No use of qualitative data and No complementation of quantitative data with qualitative data; a lack of triangulation should also be emphasised (Table 7).

To explore the impact of these difficulties, respondents were also asked to rank the top three difficulties in terms of HWF planning data at the national level. When computing the **impact scores**

⁴¹ See the more detailed format in Annex II.

of the factors: three scores were given for 1st rank, two scores for 2nd rank and one additional score for 3rd rank. The factors with the highest impact were:

1. Non-available data,
2. No good quality data (validity, reliability),
3. No up-to-date data,
4. Lack/Misuse of models/methods/data, and
5. No use of qualitative data.

Analysing the lists of frequency and impact scores, a strong overlap was found. As the previous MPDR data availability analysis pointed out, the first and most significant problem is data availability.

4.6. How to overcome data gaps: solutions beyond the typical gap groups

In order to find practical, realistic, achievable and manageable solutions for the identified gaps, typical gap groups were created (Table 8). Typical gap groups summarise the most significant gaps detected in the MS. Four gap groups were established focussing on 1) national-level collaborations in the process of HWF planning, 2) methodological issues, 3) HWF planning data, and 4) qualitative approaches.

After investigating the frequency and impact of different barriers, the lines of action needed were investigated. The addressability of these gaps was discussed⁴² by countries stating whether the country context allows them to address the specific gaps easily, with difficulty or whether they consider these gaps as everlasting. **Everlasting gaps did not occur at a high prevalence** (for instance, in Germany, national-level HWF planning is less likely in the federal system). Other countries and EU-level professional organisations participating in these discussions indicated that most gaps were easily addressable or difficult to address but still manageable.

In conclusion, MS reported that the gaps could be eliminated in the future, thus the responsibility was formulated to find the most suitable solution for MS with very diverse historical and structural backgrounds, situated at different stages of the HWF planning continuum.

⁴² The results are based on parallel group discussions held at the Budapest Workshop in June 2015.

<p>GAP GROUP 1 Difficulties in national-level collaborations</p> <ul style="list-style-type: none"> ● information and data flow failures ● unclear roles and responsibilities of actors, stakeholders involved in HWF planning ● lack of or unclear resources ● unclear structure of planning
<p>GAP GROUP 2 Methodological challenges</p> <ul style="list-style-type: none"> ● linking multiple sources ● misuse/lack of models and methods ● no tracking of shortage/surplus, i.e. mobility ● no consideration of supply/demand sides
<p>GAP GROUP 3 State of data</p> <ul style="list-style-type: none"> ● quality ● availability ● timeliness ● estimates
<p>GAP GROUP 4 Qualitative approaches</p> <ul style="list-style-type: none"> ● collecting qualitative data ● complementing quantitative with qualitative data

Table 8 - Typical gap groups

5. Conclusions

The report aimed to share knowledge on HWF planning in different EU MS with emphasis on detecting and overcoming gaps in data and planning processes. National practices were investigated in order to gain deeper insight into national HWF planning systems. In addition, the report aimed to support MS in building up and developing data collections to support HWF planning systems. **Gap analyses** were carried out to reveal and identify the significant gaps in HWF planning processes that influence data quality and the data collections and the HWF planning data were investigated. The **working hypothesis** of HWF planning continuum was established as a starting point, which focussed on the widespread actions in HWF planning, capturing the variety of stages in HWF planning development. During the analyses, a **flowchart** was prepared that presents the complete HWF planning process (e.g. political commitment, communication, assessment, evaluation, fine-tuning) and shows the important steps to be conducted towards systematic HWF planning. The most occurring gaps in the planning process are also indicated in the flowchart. A **data gap matrix** was elaborated that reviewed the HWF planning data availability - compared to the Minimum Planning Data Requirements - that is a crucial aspect in HWF planning development. The findings of the **12 MS resulted in two country clusters** that represent the phases of the HWF planning development continuum.

Beyond these results, we shall emphasise that **no definite borderline can be set between the HWF planning process and data** without a clear, thorough evaluation of HWF planning systems. It is also important to realise that **HWF planning data and the HWF planning process have to be studied together**, since their close connection and interdependency (with an important impact on quality) should always be considered. Further research would be beneficial to involve more country practices in studies and reveal more aspects, implications of the present topic.

We can conclude that the results of this report contribute to **knowledge sharing and a better understanding** of national HWF planning systems in European countries, particularly in the identification of factors that undermine national HWF planning processes and reduce the quality of national HWF planning data.

6. Recommendations

In this chapter, **recommendations** are formulated for each gap group (Figure 8), and supporting practical tools belonging to the recommendations are presented in the next chapter.

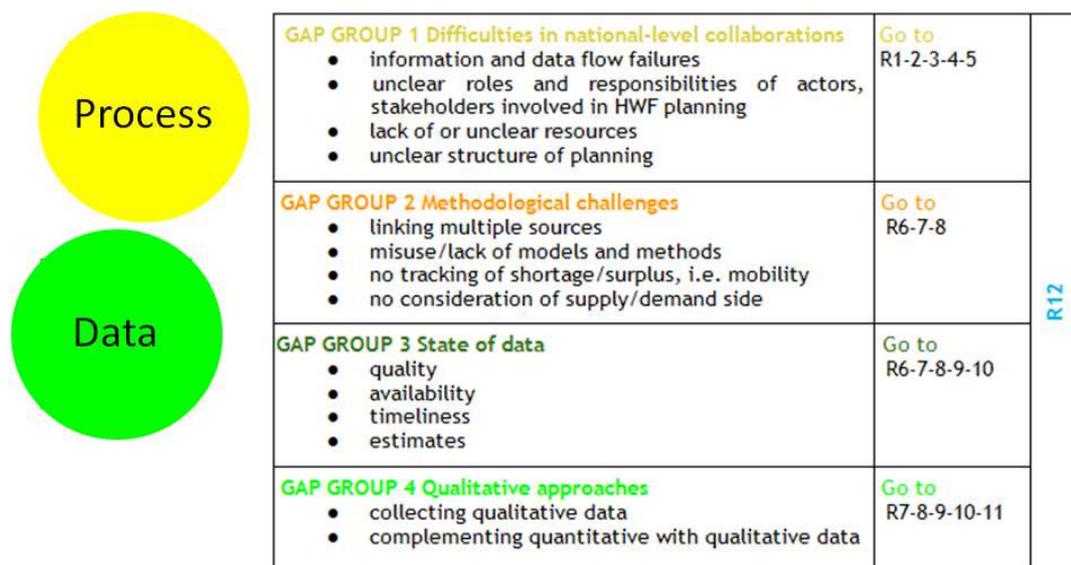


Figure 8 - Link between gap groups and recommendations

Recommendations were formulated in order to support reviewing and developing HWF planning systems. Some recommendations focus on revising and improving HWF planning processes, some on HWF planning - quantitative and qualitative - data development and at the end on HWF planning evaluation. Recommendations are adaptable to different country situations so they can support MS in customising and tailoring the further HWF planning development processes. Recommendations are developed both for **national-level stakeholders** and **EU-level professional organisations**. All recommendations must comply with the necessary data security and privacy regulations.

Recommendations on HWF planning processes	
R1	Since some countries identified the lack of a systematic approach and unstructured line of steps in HWF planning, ⁴³ a feasible and achievable HWF planning process should rely on minimal common guiding steps .

⁴³ See the results in the “4.1 Overview of national HWF planning activities across MS” chapter.

R2	Considering the path towards systematic and strategic HWF planning, ⁴⁴ a measurement instrument could be supportive for listing the objective criteria of systematic HWF planning . An evaluation list providing a set of elements for systematic and comprehensive HWF planning could facilitate self-evaluation and additionally reveal areas for improvement and/or expansion.
R3	In light of the fact that several countries face problems with respect to setting up national-level collaboration (e.g. coordination and communication management as a typical bottleneck, information and data flow failures, roles and responsibilities are often unclear), ⁴⁵ special attention should be paid to information flow and communication management . Quick tools, instruments should be designed and developed to help realising national-level collaboration and tackle emerging difficulties.
R4	Invest in HWF planning resources (human, financial, infrastructural, technical, skills-related) and revise them annually/biannually at the national/Member State level. Such investment and the efficient use of resources, together with the continuous evaluation of the use of resources, could result in cost-effective operations in the long run. ⁴⁶
R5	<p>Setting up a designated responsible entity,⁴⁷ a HWF Planning Committee/authority at the national/Member State level for operational HWF planning would be beneficial in strengthening national-level collaborations. Stronger leadership, with clear decision-making levels and roles, could help eliminate fragmented efforts and thus provide more coherent actions. Optimising the involvement of a broad range of actors/stakeholders would lead to achievable and better defined roles/functions/skills/tasks.</p> <ul style="list-style-type: none"> • The composition of a national HWF Planning Committee/body/team/group would require capacity building and multidisciplinary expertise in, e.g. health management, health policy, health financing, statistics, epidemiology, sociology, data analyses, communication, HR information system managers, technical officer/computer operator, administrative support, etc. • Ensuring expertise by involving stakeholder representatives of central governmental bodies, ministries, regulatory bodies, authorisation offices, professional representative bodies/organisations, chambers, statistical offices, regional/local representatives, universities and research institutes, health insurance funds/insurance companies, civil society-NGOs, patient organisations, multilateral agencies/network representatives, etc.

⁴⁴ See the results, country clusters in the “4.1. Overview of national HWF planning activities across MS” chapter.

⁴⁵ See the results in the “4.3. Main steps and gaps of HWF planning processes” chapter.

⁴⁶ See the results in the “4.3. Main steps and gaps of HWF planning processes” chapter.

⁴⁷ See the results in the “4.2. Essential elements of systematic and comprehensive HWF planning” chapter.

R5a	<p>EU-level professional organisations can contribute to the development of MS-level HWF planning systems by having continuous interactive consultations with their national-level member organisations.⁴⁸ Strengthening the role of EU-level professional organisations might add diverse perspectives or ensure more reliable and valid data. Therefore, these Recommendations focus on Strengthening the role of EU-level Professional Organisations in overcoming difficulties in national HWF planning and forecasting.</p> <p>Following the handbook produced by WP5, stakeholder involvement is to be considered a good practice for accurate planning and political consensus. Among the stakeholders, the professional organisations play a special role as the main representatives of the health workforce themselves. Within the focus of this report, they may in particular contribute to closing the identified gaps by being:</p> <ol style="list-style-type: none"> 1. “Supportive” - Supporting awareness-raising at the EU level and contributing to the policy process that determines HWF planning in strategic discussions with a proactive attitude. 2. “Active” - Taking an active part in policy and strategy discussions sharing knowledge in HWF planning consultations at the EU level. 3. “Consultative” - Being consulted and participating in the data validation process with national-level member organisations. 4. “Mutual” - Sharing HWF data at the national and international level, which complies with necessary data security and privacy regulations. 5. “Informed” - Discussing HWF planning data and information with national member organisations and encouraging members by fostering exchanges in this two-way process. 6. “Cooperative” - Facilitating and contributing towards bringing together actors in consensus building to target specific country problems at the EU level. 7. “Communicative” - Disseminating information at the EU level: Gathering and communicating needs and incentives for data-sharing among member organisations and communicating technical and operational competence for managing information (HR, technology). 8. “Coordinative” - Assessing the capacity to act as a focal point to coordinate input and feedback at the EU level.
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⁴⁸ Based on the results of the consultation with EU level professional organisations.

Recommendations on HWF planning data	
R6	Based on the findings, ⁴⁹ many countries lack specific data for HWF planning, therefore countries should improve and focus on the aspects of data collection, sharing, and management .
R7	<p>Since data is doubtlessly a crucial element in HWF planning, efforts on increasing data quality should be ensured⁵⁰ by</p> <ul style="list-style-type: none"> • strengthening registry data (providing anonymisation and data protection for individuals), • setting up sufficient data collections and cleansing (regular updates), • making use of existing accurate data, • conducting additional surveys, • performing validity and reliability checks through triangulation (duplications in data collections should be eliminated), • increasing transparency (clear information flow and communication management), • increasing the interest and motivation of data collections to modify their sets of data required for HWF planning, • building up a one and only unified data source linking-supported data warehouse.⁵¹ <p>Health policy interventions should use appropriate evidence with considerations for methodological limitations. The danger of bias should be considered in order to prevent inappropriate health policy actions occurring from:</p> <ul style="list-style-type: none"> • misinterpretation of data (e.g. frequent change in data sources, “break in the series”), • misuse of data, • using data collected for different purposes, without taking this into account, • no updates of old data that then cannot be used for monitoring trends, and • lack of real-time databases (which enables data analysis directly from the real-time databases).
R8	Since trends significantly matter in HWF planning, estimates ⁵² based on quantitative and qualitative data in the continuous situation analysis/trend analysis and environment scan should be utilised. Quantitative databases should require annual updates in order to understand the latest trends and changes in the HWF. Survey-based quantitative estimates would be preferred in case of the lack of comprehensive data on important issues. Qualitative methods and data could complete the understanding and interpretation of the current HWF situation via triangulation ⁵³ .

⁴⁹ See the results in the “4.4. Data content gaps with respect to the Minimum Planning Data Requirements” chapter.

⁵⁰ See the results in the “4.5. Significant barriers to HWF planning data” chapter.

⁵¹ See the results in the “4.5. Significant barriers to HWF planning data” chapter.

⁵² Estimate: an approximate calculation or judgement of the value, number, quantity or extent of something.

⁵³ Triangulation (Bogdan, Biklen 2006, Rothbauer, 2008) is a powerful technique that facilitates the validation of data through cross-verification from two or more sources. In particular, it refers to the application and combination of several

R9	Big data and e-health ⁵⁴ solutions should be incorporated to enable more efficient HWF planning data gathering and data linking, and the utilisation of interoperable and comparable datasets should be fostered. Building a wider network of information and providing increased connectivity could strengthen the focus on HWF planning data. Big data and e-health solutions, as innovative technologies and new possibilities can optimise healthcare service delivery through strengthened data linking and exchange of information, therefore organisation and planning the HWF can be managed in a new strategic level. These initiatives must comply with the necessary data security and privacy regulations. ⁵⁵
R10	Based on the findings, ⁵⁶ the required data for HWF planning is sometimes incomplete or unavailable. Setting goals is an important aspect for establishing and maintaining HWF planning. Setting up a three-level continuum of objectives in HWF planning - organising objectives from the most basic ones (first level) to the more complex ones (third level) - is recommended depending on the maturity level of planning system. ⁵⁷
R10a	The first-level objective of HWF planning is the inventory of stock and the related objective is the replacement of the current domestic HWF.
R10b	The second-level objective of HWF planning is the identification of imbalances between the existing stock of health professionals (current imbalance), the projection of stock (future imbalance) and the consumption forecast (current and future demand and whether it is resulting in imbalances) in the future.
R10c	The third-level objective of HWF planning includes the complete variation of the stock as measured and converted into potential service through the application of real FTE, taking into account the gender and the mobility of the HWF.
R11	In light of the expansion of the utilisation of qualitative methodology , qualitative data collections should be incorporated to enable deeper analysis and understanding of quantitative data in HWF planning. Qualitative methods and data could complete the overview, understanding and interpretation of the current HWF situation. ⁵⁸

research methods in the study of the same phenomenon. By combining multiple observers, theories, methods, and empirical materials, researchers can hope to overcome the weaknesses or intrinsic biases and problems that come from single method, single-observer and single-theory studies. It is a method-appropriate strategy for establishing the credibility, reliability and validity of analyses.

⁵⁴ Big data is a collection of large and complex data sets which are difficult to process using common database management tools or traditional data processing applications (Sun & Reddy, 2013)

E-health is the transfer of health resources and healthcare by electronic means (WHO n.d.)

⁵⁵ For further legislative details, see: http://ec.europa.eu/justice/data-protection/law/index_en.htm

⁵⁶ See the results in the “4.4. Data content gaps with respect to the Minimum Planning Data Requirements” chapter.

⁵⁷ See 7.2. chapter for more detailed visualised tables.

⁵⁸ See the results in the “4.5. Significant barriers to HWF planning data” chapter.



	<p>Incorporating qualitative approaches could be beneficial, as they:</p> <ol style="list-style-type: none"> 1. contribute to continuous situation analysis of the main trends, 2. contribute to deeper analysis and understanding, while focussing on issues needing in-depth analysis, 3. contribute to select methods by rationales, 4. contribute to the triangulation of HWF results channelled into health policy implications (content/thematic analysis of policy documents), and 5. contribute to evidence-based HWF planning.
<i>Recommendation on HWF planning evaluation</i>	
R12	<p>The assessment of HWF planning is rather challenging in several countries. Regular evaluation, revision and fine-tuning - in addition to established mechanisms - are needed in order to further update, modify and develop HWF planning.⁵⁹ The “Toolkit on HWF planning” and the use of the tools and recommendations themselves are relevant for this evaluation purpose.</p>

⁵⁹ See the results in the “4.2. Essential elements of systematic and comprehensive HWF planning” chapter.

7. “Toolkit on Health Workforce Planning”

The “Toolkit on Health Workforce Planning” was prepared by the WP4 team linked to aforementioned targeted recommendations (R). Similarly to the recommendations, the Toolkit focussed on the four gap groups in terms of the HWF planning process (preconditions and evaluation) and HWF planning data.⁶⁰ These newly designed tools are collected to address the gaps and provide directions for achievable and manageable solutions that foster the development and support the daily operation of HWF planning. A separate webportal was developed by the WP4 team and can be accessed on the web (Link: <http://hwftoolkit.semmelweis.hu>).

The Toolkit is a collection of practical tools: protocols, guidelines, checklists, check-sheets, fact-sheets and rating scales developed and designed to help countries to adapt standardised HWF planning processes.

- ∅ These tools provide support through the identification of process bottlenecks, key components of HWF planning and the stakeholders to be involved. Additionally, they aim to formulate appropriate questions and develop a plan for implementation.
- ∅ The Toolkit helps understanding the current state and existing weaknesses of HWF planning and directs attention to possible points of improvement.
- ∅ Countries can adapt the toolkit to suit their own circumstances and choose the tools they find the most useful. (Although this document mostly refers to national-level HWF planning, the Tools can also be used at the regional level. Depending on the structure of HWF planning, even less formal planning systems can benefit from it.)
- ∅ Tools do not address every situation in HWF planning, nor do they explain everything in detail. However, they support and facilitate the implementation of the minimal steps, processes and actions, thereby enabling an overall improvement in HWF planning.

The main tool types in this document

- **PROTOCOL:** a detailed written set of instructions to guide the performance of HWF planning; a detailed plan for a procedure on how professionals should act under certain circumstances (DeRoche, 2012)
- **GUIDELINE:** a series of recommendations by experts; a compilation of successful actions (DeRoche, 2012)
- **CHECKLIST:** a list of items required, things to be done, or points to be considered. Checklists usually offer a yes/no format in relation to the demonstration of specific criteria. Checklists are used to encourage or verify that a number of specific lines of inquiry, steps, or actions are being taken (Andrews, 2008)

⁶⁰ A consultation meeting was held in Reykjavik with the participation of national experts, where the recommendations and tools were discussed and the Toolkit was tested.

- **SKILL LIST:** A list that attempts to identify and define the requirements for effective performance by setting up diverse sets of skills and competencies that are required for team success as well as to enhance team performance (Leggat 2007); a list containing personal attributes that enhance an individual's interactions, job performance and career prospects (Madden 2014)
- **RATING SCALES:** Rating scales state criteria and provide three or four response selections to describe quality, level of agreement or frequency (Alberta Assessment Consortium 2005)

Definitions (from D043 Country Template) and colour coding:

HWF planning process and preconditions = data collection, data reporting, data flows and data management

HWF planning data = data sources, data categories, data availability and methodology

HWF planning evaluation phase

Additionally, the Recommendations and Tools often refer to other Joint Action reports:

- Ø D041-Terminology gap analysis
- Ø D042- Report on Mobility data in the EU
- Ø D051-Minimum Planning Data Requirements (MPDR)
- Ø D052-Handbook of HWF planning methodologies across the EU countries
- Ø D054-Report on WP5 Pilot Study experiences
- Ø D061-User guideline on qualitative methods in HWF planning and forecasting

7.1. How to use the Toolkit

- 1) Identify which Typical Gap groups you face in your country and go to the specific recommendations and tools indicated in Table 9.
- 2) If you face difficulties in identifying your Typical Gap group, just start from R1 including the introductory tool of “HWF planning Pathway Model”.
- 3) Carefully read the general description of the Toolkit and the Tool types.
- 4) R12 on evaluating HWF planning is an overarching recommendation, which goes beyond the gap groups and strengthens overcoming all difficulties.
- 5) Set the date for first self-evaluation and use the Toolkit annually.

<p>GAP GROUP 1 Difficulties in national-level collaborations</p> <ul style="list-style-type: none"> ● information and data flow failures ● unclear roles and responsibilities of actors, stakeholders involved in HWF planning ● lack of or unclear resources ● unclear structure of planning 	<p>Go to R1-2-3-4-5 Tool 1-2-3-4-5-6</p>	R12
<p>GAP GROUP 2 Methodological challenges</p> <ul style="list-style-type: none"> ● linking multiple sources ● misuse/lack of models and methods ● no tracking of shortage/surplus, i.e. mobility ● no consideration of supply/demand side 	<p>Go to R6-7-8 Tool 7-8-9</p>	
<p>GAP GROUP 3 State of data</p> <ul style="list-style-type: none"> ● quality ● availability ● timeliness ● estimates 	<p>Go to R6-7-8-9-10 Tool 7-8-9</p>	
<p>GAP GROUP 4 Qualitative approaches</p> <ul style="list-style-type: none"> ● collecting qualitative data ● complementing quantitative with qualitative data 	<p>Go to R7-8-9-10-11 Tool 10</p>	

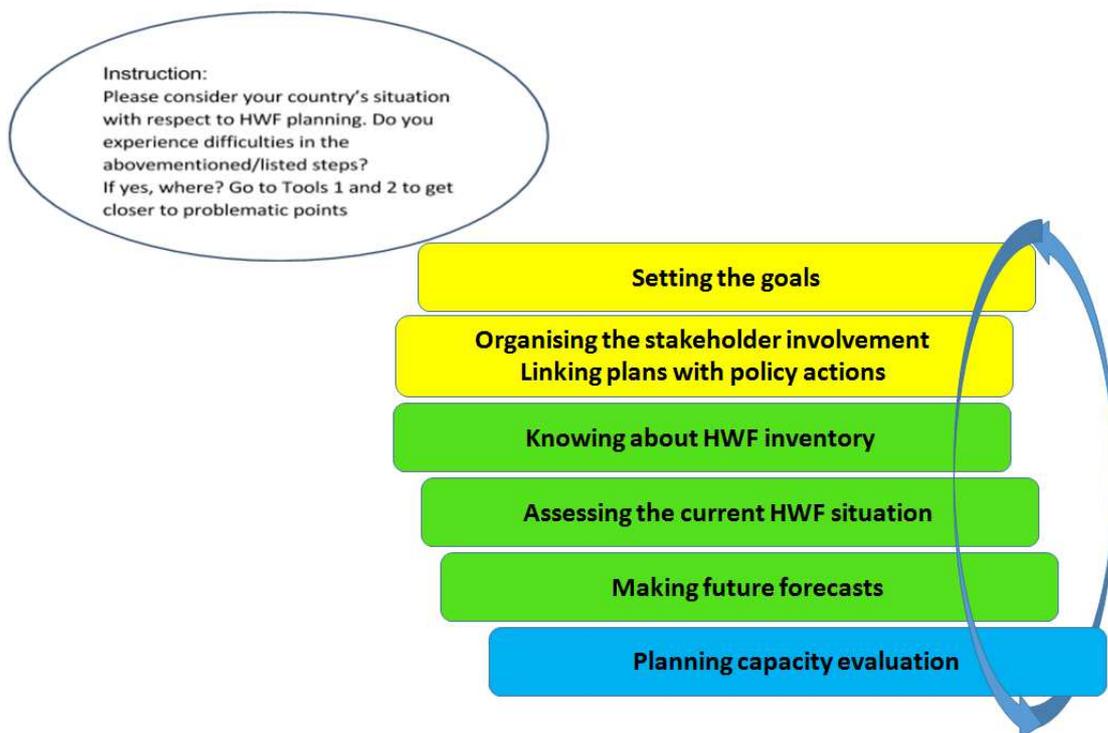
Table 9 - Typical gap groups and associated recommendations and tools

The first Gap group identified several crucial features of the HWF planning process, including the main types of gap countries frequently experience. The first branch of the recommendations and belonging tools aim to clarify and self-evaluate the level/status of HWF planning in the given country (R1-2-3, Tool 1-2-3), and supports testing of the preconditions and the evaluation of HWF planning (R4-5 and R12, Tool 4-5-6). The second-third-fourth Gap groups identified gaps in the HWF planning data (R6-7-8-9-10-11, Tool 7-8-9-10), methodology, and quantitative and qualitative data.

7.2. Toolkit for closing the identified gaps and towards improved quality HWF planning data

R1. Since some countries identified the lack of a systematic approach and unstructured line of steps in HWF planning,⁶¹ a feasible and achievable HWF planning process should rely on **minimal common guiding steps**.

The “**HWF Planning Pathway Model**” as an **introductory tool** provides a guideline that summarises general steps leading towards systematic HWF planning. Minimal and optimal steps are presented in this general level model that aim to shape a national-level framework for performance in HWF planning. This model supports the development of simple, lean processes and fosters the necessary dialogue leading to systematic action.



⁶¹ See the results in the “4.1. Overview of national HWF planning activities across MS” chapter.

The “HWF Planning Pathway Model” leading towards systematic HWF planning consists of these minimal common steps:

- 0) Setting the goals: shall provide clear and explicit objectives (transparency);
- 1) Organising the stakeholder involvement and Linking plans with policy actions: focuses on legislation issues, the way how regulations can be implemented in policy; and stakeholder involvement covers strengthening commitment with accountability;
- 2) Knowing about the current HWF inventory: examine data coverage (e.g. whether data collections are appropriate - how information gathering occurs, whether clear indicators exist - best available information, further cleansing necessary); review and develop data warehouse, expanded datasets and linking with additional data sources (data exchange);
- 3) Assessing the current HWF situation: shall conduct data analysis and HWF monitoring (environment scan, reflecting changes, interpretation of data and trends);
- 4) Making future HWF forecasts: introducing forecasting models (basic planning principles, simple scenarios with HWF to population ratio); and
- 5) Planning capacity evaluation: covers regular revisions of the HWF planning system (maintain, evaluate, refine: impact assessment).⁶²

R2. Considering the path towards systematic and strategic HWF planning,⁶³ a measurement instrument could be supportive for **listing the objective criteria of systematic HWF planning**. An evaluation list providing a set of elements for systematic and comprehensive HWF planning could facilitate self-evaluation and additionally reveal areas for improvement and/or expansion.

Tool 1: Evaluation list of **Maturity level of systematic HWF planning**

Tool type: Rating scale

Target group: HWF Planning Committee if applicable, Ministry or institution/authority responsible for HWF planning

Benefit of the tool: provides support for assessing the current state of national HWF planning

Instructions: Test your readiness for systematic and comprehensive HWF planning. Please consider at least one of the five sectoral health professions (physicians, nurses, midwives, dentists, pharmacists) and focus on the national level. Evaluate your score based on whether you already completed the following steps by using 0 “not at all”, 1 “somehow”, and 2 “completely”.⁶⁴

⁶² The HWF Planning Pathway Model corresponds with the WP5 Handbook on Health Workforce Planning Methodologies across EU Countries, see D052 page 23.

⁶³ See the results, country clusters in the “4.1. Overview of national HWF planning activities across MS” chapter.

⁶⁴ For more detailed good practices, see D052.

1.	Set-up of clear and explicit HWF planning objectives in national health policy	0	1	2
2.	Achievement of strong political commitment and awareness	0	1	2
3.	Coordinated communication and information flow among national-level stakeholders	0	1	2
4.	Dedicated and established HWF Planning Committee at the national level, designated responsible entity/specific group	0	1	2
5.	Multisectoral collaboration in HWF planning	0	1	2
Please summarize your yellow scores:				
6.	Established methodology and use of explicit model elements (with growing complexity)	0	1	2
7.	Data coverage and completeness on both supply and demand sides	0	1	2
8.	Different data sources linked to each other, fostered data exchange, building an integrated interlinked database/warehouse	0	1	2
9.	Support of online platforms, HR information systems	0	1	2
10.	Utilisation of qualitative methods	0	1	2
Please summarize your green scores:				
11.	Regular evaluation of the HWF Planning System, continuous fine-tuning	0	1	2
12.	Implementation and policy actions based on recommendations by the HWF Planning Committee	0	1	2
13.	Sustainability ensured by accomplishable/adequate resources	0	1	2
Please summarize your blue scores:				
Please summarize your total scores (yellow+green+blue):				

R3. In light of the fact that several countries face problems with respect to setting up national-level collaboration (e.g. coordination and communication management as a typical bottleneck, information and data flow failures, roles and responsibilities are often unclear),⁶⁵ special attention should be paid to **information flow and communication management**. Quick tools, instruments should be designed and developed to help realising national-level collaboration and tackle emerging difficulties.

Tool 2: “Information & Coordination Checklist” for reinforcing the functioning of HWF planning

Tool type: Checklist

Target group: decision-makers, Ministries, the administrative level of the Ministry of Health

Benefit of the tool: provides support for assessing the current state of national HWF planning and the areas to be improved

Instructions: Please mark the Table column by column by answering YES or NO. If you mark NO, please consider further suggestions for improvement provided in the brackets.

Preconditions: HWF planning environment PHASE 1	HWF planning PHASE 2	HWF planning Evaluation/Sustainability PHASE 3
Have you set-up an explicit and clear objective for HWF planning? YES NO (go to D052)	Do you have a clearly communicated and accepted HWF planning structure? YES NO (go to Tool 3)	Are the results of HWF planning channelled into policy implementation? YES NO (go to R12)
Have you confirmed clear roles for the actors in HWF planning? YES NO (go to the R1 HWF Planning Pathway Model and consider the steps)	Have you approved a National HWF Plan/strategic plan? YES NO (prepare one with the established components scope, tasks, timeframe, budget and actors)	Are the interventions and policy actions based on the results of HWF planning? YES NO (go to R12)

⁶⁵ See the results in the “4.3. Main steps and gaps of HWF planning processes” chapter.

<p>Have you authorised any dedicated actors accountable/responsible for HWF planning, i.e. a HWF Planning Committee with an appropriate mix of skills?</p> <p>YES NO (go to Tool 4)</p>	<p>Do you have clearly communicated and accepted information and data flow at the national level?</p> <p>YES NO (go to Tool 3)</p>	<p>Do you regularly revise, alter and refine the HWF Planning System?</p> <p>YES NO (go to R2 and R12)</p>
<p>Have you prepared a list of relevant types of stakeholders in the field of HWF planning?</p> <p>YES NO (go to Tool 5)</p>	<p>Do you have an integrated data warehouse for HWF planning?</p> <p>YES NO (go to Tool 7 and 9, and see R6 and 9)</p>	<p>Have you dedicated financial resources for continuous and sustainable HWF planning?</p> <p>YES NO (go to R4)</p>
<p>Have you set-up a coordination path among the stakeholders?</p> <p>YES NO (go to Tool 3)</p>	<p>Do you link different data sources in order to get a comprehensive overview of the HWF?</p> <p>YES NO (go to Tool 7 and 9, and R6 and 9-10)</p>	<p>Have you dedicated infrastructural resources for continuous and sustainable HWF planning?</p> <p>YES NO (go to R4)</p>
<p>Have you involved all stakeholders in the HWF planning process? (consider, for example, regional-level representatives)</p> <p>YES NO (go to Tool 5)</p>	<p>Do you have an explicit national HWF planning and forecasting model? (from simple - e.g., the HWF to population ratio - to complex simulations)</p> <p>YES NO (go to D052)</p>	<p>Have you dedicated technical resources for continuous and sustainable HWF planning?</p> <p>YES NO (go to R4)</p>
<p>Do you hold regular consultations with stakeholders?</p> <p>YES NO (go to Tool 3)</p>	<p>Do you use platforms and HR information systems to support HWF planning?</p> <p>YES NO (go to Tool 7, 9)</p>	<p>Have you dedicated human resources for continuous and sustainable HWF planning?</p> <p>YES NO (go to R4-5, Tool 8)</p>
<p>Do you collaborate or have you initiated collaboration with other sectors, e.g., education, finance, labour and social sectors?</p>	<p>Do you carry out environmental scans for continuous situation analysis?</p>	<p>Have you involved stakeholders in the HWF evaluation process?</p>

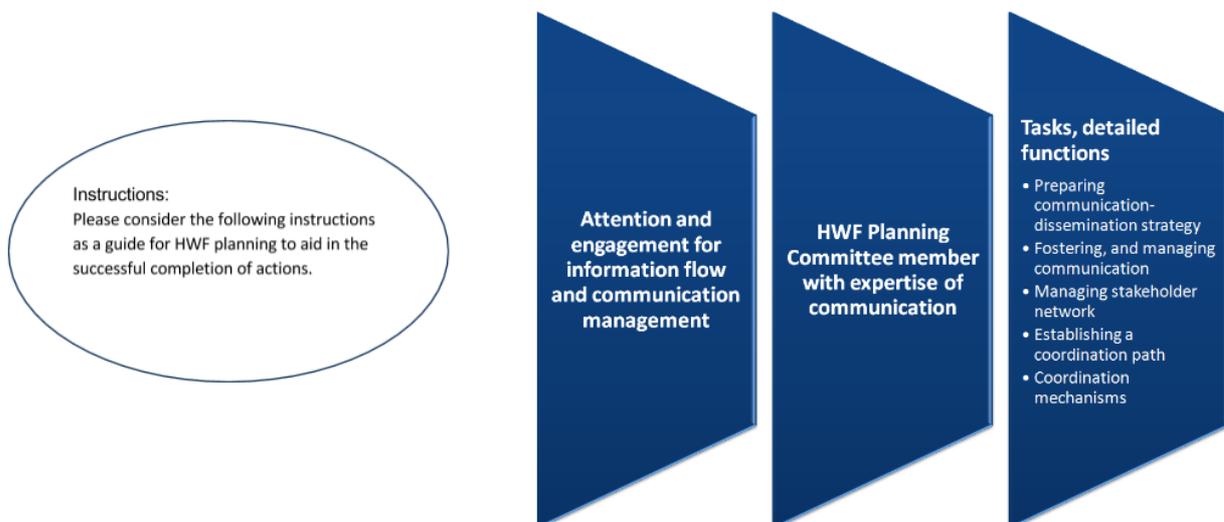
YES NO (go to Tool 3)	YES NO (go to Tool 7)	YES NO (go to D054)
	Do you regularly update HWF planning (processes and data)? YES NO (go to D052)	

Tool 3: WP4 Protocol for information flow and communication management

Tool type: Protocol

Target group: decision-makers, Ministries

Benefit of the tool: supports governance and management of the HWF planning stakeholder network and covers all phases of the overall HWF planning process (see WP4 flow chart)



Description: First, please identify all actors and stakeholders in the field of HWF planning. What stakeholders can be listed in the HWF planning stakeholder network? (Use together with Tool 5)

1. **WHAT:** Attention and engagement should be dedicated to information flow and communication management (R3). Recognising the importance of information flow and communication management in the process of HWF planning is crucial, as is emphasising critical bottlenecks. It is beneficial to elaborate on Governance/Attention regarding this process since direct efforts and consequences/benefits can be easily calculated. As a result successfully influencing stakeholders' attitudes, having/building a common vision among stakeholders and teamwork can all be accomplished.

2. WHO: A HWF Planning Committee (R5) member with expertise in communication should pay attention to this process. Therefore, identify one person responsible for communication management issues who primarily ensures transparency, sustainability, updates and follow-ups regarding any changes to the HWF planning field.
3. HOW: Tasks and detailed responsibilities of the communication manager:
 - Preparing a communication-dissemination **strategy** that includes knowledge sharing and awareness raising. Regular evaluation and revision of the strategy is also required in order to establish more appealing communications regarding evidence in HWF planning and the interpretation of the results of analyses.
Considering the communication and dissemination **channels** according to target groups also belongs to the strategy: What items are of greatest assistance for reaching the target group? Newsletters, online platforms, publications, reports, scientific manuscripts, circulated emails, conferences, workshops, policy dialogues, etc.
 - Fostering, monitoring, governing and managing communication: **Updating** information for stakeholders on a regular basis is preferable, also investing in network-building, i.e., exploring new stakeholders and interested parties.
 - Creating, developing, strengthening, assessing and managing the stakeholder network and any partnerships/alliance more productively could bring higher-level **collaborations** and increased clarity in the information flow.
 - Establishing a **coordination path** in information flow: Investigating information flow directions (how key actors relate to each other), preparing a stakeholder analysis and list with entitled bodies in HWF planning is enviable. For example: Ministry/decision-maker → HWF Planning Committee → Stakeholders
 - Coordination mechanisms: Strategy development for stakeholder engagement is necessary
Internal events: Organising the meetings of the HWF Planning Committee
External events: Organising adequate stakeholder consultations, annual national gatherings with all stakeholders, Ws, individual/group meetings/Delphi/revision rounds, etc; managing the whole network with attention to international experts or those from other sectors.

R4. Invest in HWF planning **resources** (human, financial, infrastructural, technical, skill-related) and revise them annually/biannually at the national/Member State level. Such investment and the efficient use of resources, together with the continuous evaluation of the use of resources, could result in cost-effective operations in the long run.⁶⁶

R5. Setting up a **designated responsible entity**,⁶⁷ a HWF Planning Committee/authority at the national/Member State level for operational HWF planning would be beneficial in strengthening national-level collaborations. Stronger leadership, with clear decision-making levels and roles, could

⁶⁶ See the results in the “4.3. Main steps and gaps of HWF planning processes” chapter.

⁶⁷ See the results in the “4.2. Essential elements of systematic and comprehensive HWF planning” chapter.

help eliminate fragmented efforts and thus provide more coherent actions. Optimising the involvement of a broad range of actors/stakeholders would lead to achievable and better defined roles/functions/skills/tasks.

- The composition of a national HWF Planning Committee/body/team/group would require capacity building and **multidisciplinary expertise** in, e.g. health management, health policy, health financing, statistics, epidemiology, sociology, data analyses, communication, HR information system managers, technical officer/computer operator, administrative support, etc.
- Ensuring expertise by involving **stakeholder representatives** of central governmental bodies, ministries, regulatory bodies, authorisation offices, professional representative bodies/organisations, chambers, statistical offices, regional/local representatives, universities & research institutes, health insurance funds/insurance companies, civil society-NGOs, patient organisations, multilateral agencies/network representatives, etc.

Tool 4: The Optimal Skill list for the **HWF Planning Committee**: Nine Optimal Core Competency Dimensions reflect the core competences and foundational skills desirable for professionals engaging in HWF planning in order to improve performance

Tool type: Skill list

Target group: decision-makers, Ministries or the HWF Planning Committee if applicable, the institution or competent authority responsible for HWF planning

Benefit of the tool: aims to improve the composition and performance of the HWF Planning Committee

Instructions: Assess the Optimal Skills of the HWF Planning Committee. Do they match/achieve the Nine Optimal Core Competency Dimensions? Examine the gaps and attempt to ensure that the optimal skills are covered.

	Core Competency	Skill Description
1.	Health Policy Development and Programme Planning Skills	monitor policy implementation, operations planning, implement strategy
2.	Legal Skills	legal terminology, legal studies
3.	Management Skills	management, problem solving
4.	Leadership and Systems Thinking Skills	leadership development, adapt to changes
5.	Communication Skills	share information, information and communication, manage electronic information

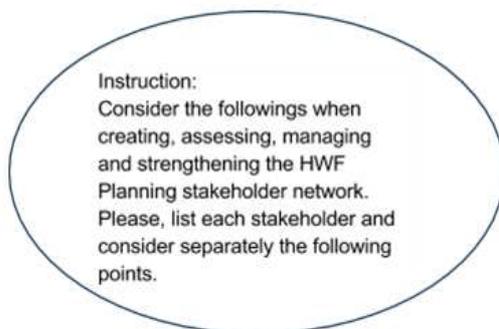
6.	Analytical and Data Assessment Skills	time series analysis, surveying, development of statistical methods, mathematical statistics, statistical forecasting
7.	Health Informatics Skills	web application/software development
8.	Financial Planning Skills	financial planning, financial analysis, budget design
9.	Labour Force Intelligence Skills	labour market economics and policies, educational issues

Tool 5: The **Stakeholder coverage evaluation tool** - to carry out an evaluation of the national stakeholder network, to conduct analysis and ensure the setting up of collaboration by a national-level HWF planning network.

Tool type: Checklist

Target group: HWF Planning Committee if applicable, institution/authority responsible for HWF planning or Ministry

Benefit of the tool: supports national stakeholder analysis for strengthening and assessing the national HWF planning stakeholder network



NAME OF STAKEHOLDER	YES	NO
1. Willingness to collaborate		
2. Stakeholder motivation		
3. Stakeholder expertise		
4. Stakeholder power		
5. Stakeholder capacity		

Description:

Consider the following dimensions for each stakeholder and check for changes regularly. Apply the tool for each separate stakeholder.

1. Willingness to collaborate: engagement towards mutual benefits, commitment to joint efforts, dialogue, attention for those who are less interested in operating a planning model. Questions to be answered: Why is the engagement low-high? What are the underlying reasons? How can commitment be increased?

2. Stakeholder motivation: clear common purposes, support for HWF planning within the organisation, partnership efforts confirmed.
Questions to be answered: How does HWF planning fit the mission of the stakeholder organisation? How does this HWF planning stakeholder network support the operation of the stakeholder organisation? How do you contribute to the HWF planning stakeholder network? How can motivation be increased and strengthened?
3. Stakeholder expertise: complementarities, previous work/materials/mission in harmony, any positive experience.
Questions to be answered: What previous experience in this field does the stakeholder possess?
4. Stakeholder power: Force Field Analysis (by Lewin)
Questions to be answered: What helping/driving forces and hindering/restraining forces exist? What drives or blocks the process? Do you assess these forces as weak or strong?
5. Stakeholder capacity: does the organisation have the resources (financial, HR, technology, competences/abilities/expertise) staff roles and balancing responsibilities that are necessary within the stakeholder organisation?
Questions to be answered: What capacity is currently available? What capacity would be necessary to achieve the desired improvements? How to move forward? What are the critical steps? How to avoid or mitigate risks? How to allocate work?

R5.a) Recommendations for EU-level professional organisations to support HWF planning in MS

After investigating MS and national practices in HWF planning, the role of EU-level professional organisations was also experimented. The discussions emphasised that the EU-level can contribute to the development of MS-level HWF planning systems by having continuous interactive consultations with their national-level member organisations. Strengthening the role of EU-level professional organisations might add diverse perspectives or ensure more reliable and valid data. Therefore, WP4 Recommendations focus on *Strengthening the role of EU-level Professional Organisations in overcoming difficulties in national HWF planning and forecasting*.

Following the handbook produced by WP5, stakeholder involvement is to be considered a good practice for accurate planning and political consensus. Among the stakeholders, the professional organisations play a special role as the main representatives of the health workforce themselves. Within the focus of this report, they may in particular contribute to closing the identified gaps by being:

1. “Supportive” - Supporting awareness-raising at the EU level and contributing to the policy process that determines HWF planning in strategic discussions with a proactive attitude.
2. “Active” - Taking an active part in policy and strategy discussions sharing knowledge in HWF planning consultations at the EU level.
3. “Consultative” - Being consulted and participating in the data validation process with national-level member organisations.

4. "Mutual" - Sharing HWF data at the national and international level, which complies with necessary data security and privacy regulations.
5. "Informed" - Discussing HWF planning data and information with national member organisations and encouraging members by fostering exchanges in this two-way process.
6. "Cooperative" - Facilitating and contributing towards bringing together actors in consensus building to target specific country problems at the EU level.
7. "Communicative" - Disseminating information at the EU level: Gathering and communicating needs and incentives for data-sharing among member organisations and communicating technical and operational competence for managing information (HR, technology).
8. "Coordinative" - Assessing the capacity to act as a focal point to coordinate input and feedback at the EU level.

Tool 6: The **Brief training outline**/minimum modules for the HWF Planning Committee: knowledge sharing and capacity building. The Brief training outline supports the development of and/or closes gaps in the skills and competences of the people responsible and involved in HWF planning (data providers and/or the members participating in the HWF Planning Committee).

Tool type: Guideline

Target group: HWF Planning Committee if applicable: institution/authority responsible for HWF planning, or Trainers, Experts in HWF planning

Benefit of the tool: aims to improve the composition and performance of the HWF Planning Committee

Instructions: When creating and improving the composition and performance of the HWF Planning Committee or when organising training programmes for people involved in HWF planning, please consider the following Modules.

Tailored programmes are necessary in HWF planning performance

- Module 1: Strategic thinking and Programme planning
- Module 2: Data collections and Epidemiology
- Module 3: Data analyses and Evidence-based interventions
- Module 4: Health Policy and Management
- Module 5: Communication and Coordination

R6. Based on the findings,⁶⁸ many countries lack specific data for HWF planning, therefore countries should **improve** and focus on the aspects of **data collection, sharing, and management**.

Tool 7: The “Maturity level of HWF Planning Data Management” Checklist - contributes to the optimisation of data management specifically for HWF planning data. This Checklist provides practical steps for data-handling processes to be tailored, adapted to the national context/needs.

Tool type: Checklist

Target group: HWF Planning Committee if applicable, institution/authority responsible for HWF planning, HWF data collector and analyst

Benefit of the tool: provides support to explore the current state of national HWF planning data, data collections and areas to be improved

Instructions: Please mark the Table column by column by answering YES or NO. If you mark NO, please consider further suggestions for improvement provided in the brackets.

HWF Planning data handling	HWF Planning data
<p>Do you use Registry data for HWF planning?</p> <p>YES NO (please consider how you could use, maintain, validate and update the Registry data for HWF planning)</p>	<p>Have you identified the data necessary for HWF planning?</p> <p>YES NO (please see D041-D051, R10)</p>
<p>Do you conduct different data collections for HWF planning? (e.g. sampled surveys, additional data collections, secondary data collection)</p> <p>YES NO (please consult the options on how additional data collections could be initiated; see R8-9-10-11, Tool 10 & D061-D052)</p>	<p>Is the data necessary for HWF planning available?</p> <p>YES NO (please check whether MPDR is available and manageable to collect in your country, and see R10)</p>

⁶⁸ See the results in the “4.4. Data content gaps with respect to the Minimum Planning Data Requirements” chapter.

<p>Do you have standard codes at the national level (data/variables categorised in the same way at every data collecting institute)?</p> <p>YES NO (please consider checking the crucial HWF planning data categories D041-D051, R10)</p>	<p>Do you carry out continuous situation analysis, monitoring and environment scans?</p> <p>YES NO (please check data coverage, what variables are included in data analyses)</p>
<p>Do you have a specific intersectoral integrated database and proper central data warehouse for HWF planning?</p> <p>YES NO (please consider official documents and legislation that require or codify a HWF planning data warehouse and aim to facilitate data exchanges between data collecting and reporting institutes in order to set up and build the HWF planning data warehouse, which would ideally consist of multi-sectoral and multi-professional data, where individual data is completed with sampled survey results, see R8-9)</p>	<p>Do you have available data to track imbalances of national HWF?</p> <p>YES NO (please, check the frequency of updates)</p>
<p>Do you have a database and data warehouse that is supported by IT solutions?</p> <p>YES NO (please consider whether your country is planning to develop this field contact stakeholders with IT expertise)</p>	<p>Do you regularly revise data coverage and completeness to react to and reflect changes?</p> <p>YES NO (please use Tool 9-10 to reveal timeliness, availability, accuracy, completeness and comprehensiveness of data, and R10)</p>
<p>Do you have a national HR/HWF information system?</p> <p>YES NO (please consider how IT systems communicate in your country and consider whether your country is planning to develop business intelligence tools)</p>	<p>Do you regularly check data quality, reliability and validity?</p> <p>YES NO (please, use Tool 9-10, and see R12)</p>
<p>Do you link data sources and data sets?</p> <p>YES NO (please consider the ideal composition of data sources. What types of data sources to link: Registry (authorisation register ideally available</p>	<p>Do you use assessment tools?</p> <p>YES NO (please consider assessment options and use the Toolkit regularly, R12)</p>

online), residence and employment, tax-payroll)	
<p>Have you set data-sharing agreements/joint ownerships to ensure accessibility?</p> <p>YES NO (please consider official documents and legislation that require or codify HWF planning data warehouses and aim to facilitate data exchanges between data collecting and reporting institutes in order to ensure accessibility)</p>	<p>Do you cover both the supply and demand sides?</p> <p>YES NO (please check D051-D052 for MPDR and good practices in HWF planning data collections, and R10)</p>
<p>Do you use a single ID to link data?</p> <p>YES NO (please consider data protection and privacy regulations in your country)</p>	<p>Do you have established forecasting models and a methodology for HWF planning?</p> <p>YES NO (see good practices in D052)</p>
<p>Do you have data management standards used in other sectors economic/science as a good practice?</p> <p>YES NO (please consider collecting good practices from other sectors)</p>	<p>Is your forecasting model based on a simple scenario/estimations? (HWF to population ratio)</p> <p>YES NO (see good practices in D052)</p> <p>Is your forecasting model based on a complex mathematical simulation? (need-based projections)</p> <p>YES NO (see good practices in D052)</p>
<p>Do you intend to involve real-time data beyond the healthcare sector (Big Data)?</p> <p>YES NO (please consider whether your country is planning to develop this field of innovative technology, and see R9)</p>	<p>Do you endeavour having data in yearly time series for HWF planning, e.g. FTE, Activity status categories, private sector?</p> <p>YES NO (please consider checking your data D041-D051)</p>

<p>Have you increased or maintained the interest and motivation of data collectors, thereby ensuring real engagement and involvement?</p> <p>YES NO (please consider the interest and motivational factors of data collectors when developing and updating HWF planning data collections)</p>	<p>Is the projection period long enough to implement actions?</p> <p>YES NO (please consider your historical context when setting up the projection period)</p>
<p>Do you regularly report data to decision-makers?</p> <p>YES NO (please consider Tool 3, and R7)</p>	<p>Do you update HWF planning projections regularly?</p> <p>YES NO (please consider updates every 2-3 years; D052)</p>

Tool 8: The **Optimal Skill list for HWF planning data specialists**, is a list that contributes to the improvement in quality of data collections by providing a list of optimal core competences and the minimum skills and competences required for HWF planning (internally or available externally if needed).

Tool type: Skill list

Target group: HWF data collector and analyst, HWF Planning Committee if applicable, institution/authority responsible for HWF planning

Benefit of the tool: aims to improve HWF planning data collections, increase data quality

Instructions: Assess the Optimal Skills of the HWF Planning Data Specialist. Do your country specialists match/achieve the Four Optimal Core Competency Dimensions?

Core Competency	Skill Description
1. Statistics skills	statistics, mathematical statistics, descriptive statistics
2. Analytical, Modelling Skills	data modelling, data processing and analysis, data communication, interpret data, interviewing
3. HR information management Skills, Technology and Data Skills	information technology, manage electronic information
4. Presenting, Reporting, Communication Skills	presenting techniques, presentation, information and communication

R7. Since data is doubtlessly a crucial element in HWF planning, efforts on **increasing data quality** should be ensured by

- strengthening registry data (providing anonymisation and data protection for individuals),
- setting up sufficient data collections and cleansing (regular updates),
- making use of existing accurate data,
- conducting additional surveys,
- performing validity and reliability checks through triangulation (duplications in data collections should be eliminated),
- increasing transparency (clear information flow and communication management),
- increasing the interest and motivation of data collections to modify their sets of data required for HWF planning,
- building up a one and only unified data source linking-supported data warehouse.⁶⁹

Health policy interventions should use appropriate evidence with considerations for methodological limitations. The danger of **bias** should be considered in order to prevent inappropriate health policy actions occurring from:

- misinterpretation of data (e.g. frequent change in data sources, “break in the series”),
- misuse of data,
- using data collected for different purposes, without taking this into account,
- no updates of old data that then cannot be used for monitoring trends, and
- lack of real-time databases (which enables data analysis directly from the real-time databases).

R8. Since trends significantly matter in HWF planning, estimates⁷⁰ based on quantitative and qualitative data in the continuous situation analysis/trend analysis and environment scan should be utilised. Quantitative databases should require annual updates in order to understand the latest trends and changes in the HWF. Survey-based quantitative estimates would be preferred in case of the lack of comprehensive data on important issues. Qualitative methods and data could complete the understanding and interpretation of the current HWF situation via triangulation⁷¹.

⁶⁹ See the results in the “4.5. Significant barriers to HWF planning data” chapter; and as further reading the D054 Report

⁷⁰ Estimate: an approximate calculation or judgement of the value, number, quantity or extent of something.

⁷¹ Triangulation (Bogdan, Biklen 2006, Rothbauer, 2008) is a powerful technique that facilitates the validation of data through cross-verification from two or more sources. In particular, it refers to the application and combination of several research methods in the study of the same phenomenon. By combining multiple observers, theories, methods, and empirical materials, researchers can hope to overcome the weaknesses or intrinsic biases and problems that come from single method, single-observer and single-theory studies. It is a method-appropriate strategy for establishing the credibility, reliability and validity of analyses.

Tool 9: The **Database maintenance and development tool** - In order to increase data quality and set up more comprehensive collections of HWF planning data, Tool 9 presents several steps for improving the “State of data” and to overcome data gaps. It summarises the PHASES of improvement and overcoming gaps regarding the “State of data”.

Tool type: Rating scale

Target group: HWF data collector and analyst, HWF Planning Committee if applicable, institution/authority responsible for HWF planning

Benefit of the tool: aims to improve HWF planning data collections, increase data quality

Instructions: Test your HWF planning data. Please score your current data process if you have already completed the following, or indicate which PHASE you are in by picking one PHASE in each row:

	PHASE 1	PHASE 2	PHASE 3	PHASE 4
Timeliness/Punctuality	No updated database	Annual/Regular updates	Real time/Up-to-date datasets	Integrated Health Information Management System
Availability/Accessibility	No data/Non-accessible data	Aggregated datasets/Yearly time series	Individual data	
Accuracy/Validity/Reliability	No accurate data	Estimates/Sample based data/Convenience sampling	High accuracy	
Coherence/Consistency	No complete/consistent database	Modifying existing data collections	Triangulated data collections	
Comprehensiveness	No comprehensive data	Data source linking	Single ID integrated data warehouse	

Note: Triangulation (Bogdan, Biklen 2006, Rothbauer, 2008) is a powerful technique that facilitates the validation of data through cross-verification from two or more sources. In particular, it refers to the application and combination of several research methods in the study of the same phenomenon. By combining multiple observers, theories, methods, and empirical materials, researchers can hope to overcome the weaknesses or intrinsic biases and problems that come from single method, single-observer and single-theory studies. It is a method-appropriate strategy for establishing the credibility, reliability and validity of analyses.

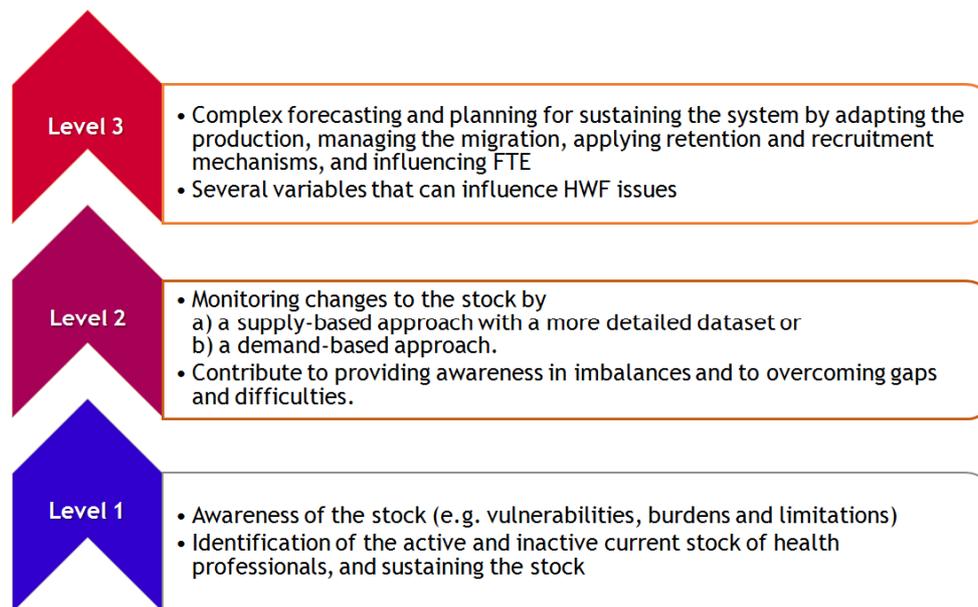
R9. Big data and e-health⁷² solutions should be incorporated to enable more efficient HWF planning data gathering and data linking, and the utilisation of interoperable and comparable datasets should be fostered. Building a wider network of information and providing increased connectivity could strengthen the focus on HWF planning data. Big data and e-health solutions, as innovative technologies and new possibilities can optimise healthcare service delivery through strengthened data linking and exchange of information, therefore organisation and planning the HWF can be managed in a new strategic level. These initiatives must comply with the necessary data security and privacy regulations.⁷³

⁷² Big data is a collection of large and complex data sets which are difficult to process using common database management tools or traditional data processing applications (Sun & Reddy, 2013)

E-health is the transfer of health resources and healthcare by electronic means (WHO n.d.)

⁷³ For further legislative details, see: http://ec.europa.eu/justice/data-protection/law/index_en.htm

R10. Based on the findings,⁷⁴ the required data for HWF planning is sometimes incomplete or unavailable. Setting goals is an important aspect for establishing and maintaining HWF planning. Setting up a three-level continuum of objectives in HWF planning - organising objectives from the most basic ones (first level) to the more complex ones (third level) - is recommended depending on the maturity level of planning system.



Therefore, the following sub-recommendations should be considered when building the HWF planning data warehouse:⁷⁵

R10. a) The first-level objective of HWF planning is the inventory of stock and the related objective is the replacement of the current domestic HWF. To reach this objective, the availability and consideration of the following data categories of MPDR⁷⁶ is necessary: **Labour force and Training**, data areas of Profession (LTP, PA, P⁷⁷), Headcount, Geographical area, Specialisation, Age and Gender.

⁷⁴ See the results in the “4.4. Data content gaps with respect to the Minimum Planning Data Requirements” chapter, and as further reading the Report D054

⁷⁵ Based on the D051 Minimum Planning Data Requirements and using its data areas and categories.

⁷⁶ D051 Minimum Planning Data Requirements

⁷⁷ Licensed to practice, Professionally Active and Practising

	SUPPLY					DEMAND	
	Labour force	Training	Retirement	Migration Inflow	Migration outflow	Population	Health consumption
Profession	X	X					
Age	X						
Head count	X	X					
FTE							
Geographic area	X	X					
Specialisation	X	X					
Country of first qualification							
Gender	X						

First level objective

R10. b) The second-level objective of HWF planning is the identification of imbalances between the existing stock of health professionals (current imbalance), the projection of stock (future imbalance) and the consumption forecast (current and future demand and whether it is resulting in imbalances) in the future.

There are two possible focus points:

- a) future imbalances of stock: Supply side approach,
- b) demand of health services: Demand side approach, where the objective is the replacement of the current domestic HWF.

To reach this objective, the availability and consideration of the following data categories of MPDR are necessary: **Labour force**, **Training** and **Retirement** data areas of Profession (LTP, PA, P), Headcount (FTE if available), Age and Gender, Geographical area and Specialisation on the Supply side, and Population Age, Headcount and Geographical area (optimally combined with Health consumption) on the Demand side.

	SUPPLY					DEMAND	
	Labour force	Training	Retirement	Migration inflow	Migration outflow	Population	Health consumption
Profession	X	X	X				
Age	X	X	X			X	X
Head count	X	X	X			X	X
FTE	X						
Geographic area	X	X	X			X	X
Specialisation	X	X	X				
Country of first qualification							
Gender	X						

Second level objective - Supply-based approach

	SUPPLY					DEMAND	
	Labour force	Training	Retirement	Migration inflow	Migration outflow	Population	Health consumption
Profession	X	X					
Age	X					X	X
Head count	X	X				X	X
FTE							
Geographic area	X	X				X	X
Specialisation	X	X					
Country of first qualification							
Gender	X						

Second level objective - Demand-based approach

R10. c) The third-level objectives of HWF planning includes the complete variation of the stock as measured and converted into potential service through the application of real FTE, taking into account the gender and the mobility of the HWF. Demand calculation remains simplified as in the

previous level (Population Age, Headcount and Geographical area, optimally combined with Health consumption). To reach this objective, the availability and consideration of the following data categories of MPDR are necessary: **Labour force, Training, Retirement and Mobility Inflow and Outflow** data areas of Profession (LTP, PA, P), Headcount (FTE if available), Age and Gender, Geographical area, Specialisation, and Country of first qualification on the Supply side.

	SUPPLY					DEMAND	
	Labour force	Training	Retirement	Migration Inflow	Migration outflow	Population	Health consumption
Profession	X	X	X	X	X		
Age	X	X	X	X	X	X	X
Head count	X	X	X	X	X	X	X
FTE	X						
Geographic area	X	X	X	X	X	X	X
Specialisation	X	X	X	X	X		
Country of first qualification	X	X	X	X	X		
Gender	X						

Third level objective

R11. In light of the expansion of the **utilisation of qualitative methodology**, qualitative data collections should be incorporated to enable deeper analysis and understanding of quantitative data in HWF planning. Qualitative methods and data could complete the overview, understanding and interpretation of the current HWF situation.⁷⁸

Incorporating qualitative approaches could be beneficial, as they:

1. contribute to continuous situation analysis of the main trends,
2. contribute to deeper analysis and understanding, while focussing on issues needing in-depth analysis,
3. contribute to select methods by rationales (see D061-D062 reports),
4. contribute to the triangulation of HWF results channelled into health policy implications (content/thematic analysis of policy documents), and
5. contribute to evidence-based HWF planning.

⁷⁸ See the results in the “4.5. Significant barriers to HWF planning data” chapter.

Tool 10: The **Guideline** for selecting qualitative methods by rationales⁷⁹

Tool type: Guideline

Target group: HWF data collector and analyst, Researcher, or HWF Planning Committee if applicable, institution/authority responsible for HWF planning

Benefit of the tool: aims to improve HWF planning data collections, increase data quality and triangulation

Instructions: Please focus on the main goals and corresponding qualitative methods in order to deliver an effective use of the qualitative approach.

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

R12: The assessment of HWF planning is rather challenging in several countries. **Regular evaluation, revision and fine-tuning** - in addition to established mechanisms - are needed in order to further update, modify and develop HWF planning.⁸⁰ The “Toolkit on HWF planning” and the use of the tools and recommendations themselves are relevant for this evaluation purpose.

⁷⁹ The table extracted from D061 User guidelines on qualitative methods in health workforce planning and forecasting (page 6).

⁸⁰ See the results in the “4.2. Essential elements of systematic and comprehensive HWF planning” chapter.

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9. Annex

Annex I. Towards systematic HWF planning on the continuum

The main strengths of HWF planning in Belgium, Finland and the Netherlands are formalisation and the use of **integrated interlinked databases and data warehouses**. With the support of **multi-sectoral collaboration**, it is **less challenging to intervene** and organise the domestic HWF. However, these countries also have difficulties to overcome, for example they often worry about the **unpredictability of the future** based on unexpected changes that may limit the assessment of future demand. On the supply side, the 2-3 year time lag (**timeliness**) and the **calculation of substitution** were listed as difficulties. In addition, the challenges of introducing precise **mobility** indicators and valid mobility data into the HWF planning models were underlined. In Belgium and Finland, the asymmetry of **regions**, the hardly manageable responsibilities and the limitations in the availability of qualified **staff** cause problems. The Finnish and the Dutch systems would like to enhance the application of **qualitative data** in their HWF planning in order to fine-tune and triangulate their HWF planning systems.

Germany and Spain also emphasised the benefits of the involvement and engagement of **various stakeholders**. Besides this, the operation of their information systems, dynamic simulations and the accessibility of **multiple data sources** are satisfactory. One of the most important global problems regarding sustainability of HWF planning in these countries is the lack of comprehensive data. At the same time, multiple data sources result in a **significant amount of data that is not used** or rather in the lack of appropriate data, similarly to the Belgian model where systematising and customising data production was highlighted as the next step in the development process. Spain stressed the insufficient skills and capacity of qualified **staff** in HWF planning, while both Spain and Germany experience some lack of reliability or gaps in the use of **mobility** data in their countries. In Spain, the enhancement of the currently operating planning system can be precisely observed: the recent updates of the models and data lead to enhanced HWF monitoring followed by HWF forecasting and planning. This enhancement of HWF planning requires the activation of the State Register for Health Professionals, which is an online national registry containing data for all five sectoral professions. This platform is still under development,⁸¹ with its operation launch predicted for early 2016. **National Registry** data might be a key factor in Spain, since it consists of quite up-to-date individual data, resulting in a relatively comprehensive database (as similarly developed in Hungary, Poland and Portugal).

Iceland, Hungary and Poland reported that they have a satisfactory amount of data, similarly to Italy. However, these data are usually **not used for HWF planning**. In Hungary and Poland, data collection improvements took place over the previous several years that resulted in well-harmonised

⁸¹ thus channelling the findings of the Joint Action is crucial for Spain

HWF monitoring systems. This data quality improvement, with the aim of establishing and refining the existing **comprehensive strategy for HWF information**, is also highlighted in Portugal, Italy and Slovakia. Therefore, the results mirror those in Iceland, Hungary, Poland, Italy and Portugal. Data collections are developed continuously, however, strategic directions and systematic frameworks are sometimes lacking. This may result in a trend where available data are not used for planning purposes. Systematic steps needed to be taken in order to have a comprehensive HWF planning system at the national level.⁸² It can be generally stated that data cannot be appropriately used without clear and appropriate data collection and management. Data identification, collection and data management processes always have to be considered and developed together. The Icelandic and Hungarian partners, similarly to Spain, would welcome **increased experience and expertise** on the part of HWF planners. Regarding data gaps, precisely following the **mobility of health professionals** is challenging without clearly defined indicators, as mentioned in almost all countries participating in this research activity. **Definition difficulties** influencing the demand and feasibility of enhancement of planning processes have also been reported, particularly in the category of nurses. In Hungary, many nurse categories are currently in use, which might cause complications in defining nurses and in determining proper and comprehensive HWF planning⁸³. Additionally, Hungary noted a **widespread categorisation** of nurses and also mentioned difficulties in tracking practicing health professionals. In Slovakia, there is a widespread range of different health professions, while Poland and Iceland declared difficulties with respect to employment status or capturing exact information on MD specialisations. Innovative new arrangements opened a new perspective in Poland: the new system solutions focus on ordering and strengthening the nursing competences, while also raising the number of students in the nursing profession. Thus, promoting the nursing profession will support nurse workforce planning for the period 2015-2020. Hungary, Slovakia, Poland and Greece underlined the negative impact of the **slow procedures** and delays due to bureaucracy and administrative processes (e.g. legislation⁸⁴). Nevertheless, **legislation** supports ongoing actions in Hungary, Poland, Italy and Portugal. Therefore, legislation can both limit and support the process. For instance, the Law on the Register in Portugal empowered further implementation of HWF planning by enlarging the scope of the HP working in the private sector, i.e. building up the data warehouse, involving strategic steps and collaborating with stakeholders at a higher level. Furthermore, Italy and Portugal both interpreted the environment of **multiple stakeholders** as benefits and barriers simultaneously. However, it is essential to ensure **engagement** of all stakeholders and identify and clarify roles and responsibilities at the national level. Meanwhile, the main issues concern their **involvement, coordination and participation** in order to improve systematic HWF planning **information flows**. Also on the data side, Italy and Portugal found it difficult to cover **HWF mobility** (in- and/or outflow) and the private sector without clear key common indicators.

In Slovakia, establishing a Human Resource Monitoring system, which contains up-to-date individual data for each health professional is ongoing, and Greece provided significant developments in data collections, where, due to the “Healthmap” project, data collections were

⁸² Ideally supported by National HWF Strategy, articulated regulations and high political commitment.

⁸³ See D041 Terminology gap analysis for further details.

⁸⁴ In Portugal, the Parliament approved the Law on the Register of Health Professionals on 22 July 2015, after a preparation phase of 3 years.



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structured. However, these steps have not been advancing in the same way yet in these countries. Concerning data gaps, Slovakia and Greece also indicated a lack of **mobility** data, non-available or non-accessible data and no data source linking as problematic. **Limited use of data** and **lack of financial resources and policy tools** can limit HWF planning processes.



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Annex IV. Country summaries

Belgium

History of HWF Planning

Belgium has an extensive history of HWF monitoring and planning based on a mathematical model. The Belgian Harmonised Mathematical Planning Model originates from an effort to harmonise several existing mathematical planning models for different health professions. This harmonisation aimed to standardise Belgian health workforce planning. The Model was conceived as a universal model, i.e. applicable for each of the different health professions implicated in workforce planning in Belgium with a time horizon of 50 years.

The Model is used within the framework of the Belgian Workforce Planning System in charge of planning the future medical doctors and dentists' workforce, and to monitor the evolution of the nursing and physiotherapy workforce. A central role in this system is played by the Planning Commission of Medical Supply (founded and codified in 1996), organised in working groups for the different health professions. This Commission is composed of representatives of the different health professions organisations, universities, health insurance companies, the national health insurance system, different government levels and invited experts. It also has a permanent administrative and scientific staff, the Workforce Planning Unit at the Federal Ministry of Health, which collects the necessary data, manages the mathematical model and provides all needed support to the commission.

Main aspects of the HWF Planning system:

- Data collected on the current stock of HWF comprises: number of active professionals, number of full-time equivalent, types of providers, where they work, their skills, the services they provide, and workloads and skills defined here as acquired certifications (e.g. diabetes care, intensive care....);
- The HWF planning tool also uses demand data which allows for the estimation of healthcare utilisation and the population's healthcare needs, in addition to the size and structure (age and gender) of the population. Healthcare consumption data are obtained from the National Institute of Health Insurance.

Data coverage, data types and data collection

Individual HWF data in Belgium is based on the following main databases:

- The National Register of Health Care Professionals, which includes "Licensed to Practice" information in the federal public services health system. This system is updated daily.
- The National Institute of Health Insurance and Disability (INAMI/RIZIV) with information about those who are practising their profession within the framework of health insurance refunded care (the large majority of existing healthcare in Belgium)

- The Crossroads Bank for Social Security for information about those health professionals who are working as employees, are self-employed or are covered by one of the social security systems in Belgium.

The main tool for monitoring the Belgian workforce of healthcare professionals is the National Register of Health Care Professionals, maintained by the Ministry of Public Health. Every health professional who wants to practise a recognised health profession on Belgian territory is required by law to obtain a licence to practice at the Ministry of Public Health and is consequently registered in this National Register. This 'Cadastre' therefore contains information about the diploma, the licence to practice, obtained specialties and competences, and further personal details of all the health professionals in Belgium.

Over the last decade, both the number of registered professions and the capabilities of this Register have grown. The current implementation consists of an electronic register built on an Oracle backbone.

While the available information in this National Register of Health Care Professionals allows for the monitoring of the size and composition of the registered workforce (i.e. those with a licence to practice), no information is available about this workforce's actual labor market participation and activity.

For each individual who is present in the National Register, the data linking can then determine his or her activity status, sector of activity, full time equivalent, region of activity, number of jobs, etc. The inclusion of health insurance data makes this data linking particularly useful for healthcare planning, since it provides information about the volumes of care which are 'produced' by an individual health care professional.

By the end of 2014, data linking projects had been undertaken for the professional groups of registered Nurses, Physiotherapists, Physicians and Dentists. While Team Workforce Planning has succeeded in setting up the basic structure and workflow which already provide very insightful data, the data linking process is still a work in progress and much remains to be done. As such, work is being done (as of 2015) to expand the included source material to other administrative databases and to improve the quality of certain existing parameters.

In parallel, steps are being taken to evolve from 'one shot' data linking projects to a more systemic, 'permanent' data linking approach, which would make it possible to link the data for all the recognised health professions on a regular basis. Such one shot linking took place for nurses in 2009, physiotherapists in 2010 and for doctors and dentists in 2012. This new approach will centre on automatisisation, standardisation and streamlined data flows. The Belgian model focuses mainly on quantitative data and methods, however, qualitative techniques are frequently used, e.g. in the consultation of experts in the different working groups and the development of hypotheses.

Trends in HWF

- The HWF in Belgium still needs to deal with several structural imbalances:
- Training imbalances: A numerus clausus applies to physicians who have graduated since 2004. It limits access to training to obtain a licence in a medical specialty practiced within the framework of health insurance. This quota is distributed over the two communities. In order to respect the assigned quotas, the Flemish Community has introduced an entrance

exam since 1997. The overall number of physicians who graduated from a Flemish Community university and who received training that falls under the quota system comes close to the overall quotas that have been assigned since 2004.

In 2014, the cumulative number was 69 units lower than the overall quotas. The situation in the French Community is different, however: during the same period, various filters were applied for several years. Appeals to the Council of State with regards to the applied filter systems made frequent revisions necessary. Until 2009, the overall number of physicians who graduated from a French Community university and who received training that falls under the quota system stayed close to the overall quotas that had been assigned since 2004. From then on, the cumulative number continually increased and ended up exceeding the overall quotas by 363 units in 2014. This difference between the two communities is still a burning issue in Belgium and it is still undecided how a solution will be reached. A decision is expected by October 2016.

- **Specialty imbalances:** During the period 2004-2008, a 19% oversupply of specialists was recorded whereas 25% of the GP quotas were unfulfilled. This phenomenon is more acute and worsening in the Dutch speaking community, where the actual inflow of GPs during the period 2004-2014 is 255 units lower than the requirements, compared to only 47 units in the French Community. While in 2015 this phenomenon is decreasing in impact, there is still no definite solution to this problem.
- **Geographical distribution of medical practitioners:** In Belgium, physicians can freely choose their practice location. This results in geographical imbalances in physician density. The density of practicing GPs varies between provinces from 9.8 GPs to 14.4 GPs per 10,000 inhabitants. The density of practicing SPs also varies between provinces from 8.4 SPs in rural areas to 24.0 SPs per 10,000 inhabitants in Brussels. The higher density of SPs in big cities relates to the higher number of hospital beds and the proximity of specialised hospitals. As in other countries, physicians are more likely to settle and practice in affluent, metropolitan areas than in rural areas.
- **International mobility of students and practitioners:** international flows of medical personnel make any national planning exercise regarding the supply of health professionals quite difficult. It should also be noted that the phenomenon is only partially documented at the moment. Only raw data are available, and the evolution of important parameters, such as which proportion of immigrants receiving the practise licence for training reasons (specialisation) will remain in Belgium, are currently hard to estimate due to a lack of historical data.

The numerus clausus that is in place in Belgium applies to physicians who have been awarded a basic diploma by a Belgian university. A considerable part of those physicians are nationals from neighbouring countries which have also adopted a numerus clausus system (mainly France and, to a lesser extent, the Netherlands). Most of them came to Belgium to receive full training (basic diploma + specialisation).

This phenomenon disorganises the Belgian quota system as those graduates are included in the quota while most of them are expected to return to their home country and will not be part of the future Belgian health workforce. Another phenomenon we can observe is the arrival of fully trained foreign health professionals who are attracted by the high standard of living in Belgium. This mobility is facilitated by EU directive EU2014/55. This further complicates the workforce planning mechanism in Belgium and needs to be taken into account.

Gaps within MDS, HWF Planning data and process

The data linking method relies on existing data, collected by specific administrations to carry out their objectives and missions. As such, the raw data does not necessarily align with the health workforce analysis perspective and may require either re-formatting, careful (re)-interpretation, or the combining of several variables to construct the desired parameter.

For physicians, the planning is based on the 34 recognised medical specialties in Belgium, which makes the task considerably more complicated: the amount of work is multiplied and can only be realised with the use of a standardised and automated approach to reporting and analysis. The guidance of the expert working groups is crucial here to set analysis priorities when faced with huge volumes of data.

A permanent data linking process for all the recognised healthcare professions combined is currently being prepared, which would provide information on the professional activities of all the paramedical and medical professions that are recognised in Belgium.

This project proposal includes the setting up of a public website, which will contain all the statistics in question and will give the user easy and customisable access to those data.

Using all the collected data sources, scenarios will be developed during 2015 and 2016 to project possible evolutions of the medical workforce over the next 25-30 years.

For all those professions, the distribution of competences over the different levels of government in Belgium makes planning more complex, in particular with regards to obtaining the data. Currently agreement protocols on data exchange are being finalised within the framework of the 6th state reform, which has altered the distribution of a number of healthcare competences. Within Belgium's administrative and political structure, a certain degree of dissymmetry between the communities and the regions is to be taken into account, with respect to the organisation of education, and the organisation and supply of healthcare. The quota system for health professionals is a federal competence, while the regulation of student numbers is a competence of the specific language communities.

Furthermore, the recent reform of the state has shifted the planning authority for the sub-quota of the medical profession to the Dutch and French speaking communities, while the general quota remains a federal competence. This shift will require close cooperation between the different government levels with regards to the health workforce policy.

While the technical difficulty of the data linking procedures requires qualified personnel to carry out, it does not constitute the main difficulty in setting up this type of data collection. The main challenge consists rather in obtaining the necessary permissions, access rights and the cooperation of the different data providers. The necessary legal and regulatory framework has to be in place to allow the data linking to proceed successfully. Making sure that the data linking stays within the

boundaries defined by national privacy protection laws also requires time and attention. The Privacy Commission has significant control over the data provided, in order to prevent the identification of individuals. For instance, instead of the ages of individuals, their age categories can be drawn from the databases, and instead of separate nationalities, regrouped nationality information (e.g. 'Southern Europe') might be available.

Furthermore, this work needs to be done in close consultation with the members of the Belgian planning commission, who dispose the relevant know-how and field knowledge. It is important to involve them in every stage in order to develop their know-how and to keep them motivated.

The data categories of the MDS are all included in the Belgian HWF Planning Model, except for the outflow migration, which is not well documented.

Areas		Supply				Demand	
Category	Labour force	Training	Retirement	Migration - Inflow	Migration - Outflow****	Population	Health consumption
Profession	Yes	Yes	Yes	Yes	No		
Age	Yes	Yes	Yes	Yes	No	Yes	Yes
Head count	Yes	Yes	Yes	Yes	No	Yes	Yes
FTE	Yes, by calculation						
Geographical area	Yes, residence	Yes	Yes, residence	Yes	No	Yes**	Yes**
Specialisation	Yes	Yes	Yes	Yes	No		
Country of first qualification	Yes***	Yes***	Yes***	Yes***	No		
Gender	Yes for current stock						

* information from population index combined with health insurance information

** system is based on three regions: Wallonia, Flanders and Brussels

*** due to data protection reasons the nationality of the doctors cannot be established for small groups

****not every health professional who leaves Belgium applies for a Good standing certificate, and not everyone who applies really leaves. Health professionals may cancel their residence when they leave, but many keep it. Only proxy indicators are available.

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Finland

History of HWF Planning

Finland has an extended history of HWF monitoring and planning. Finland considers demand for new labour for 28 industries and occupational groups as well as supply-side projections for intake needs in different fields and levels of education on an annual basis. The overall objective of this planning is to promote the availability of skilled labour in accordance with developments in industrial and occupational structures and to guarantee all young people an opportunity to apply for vocationally/professionally-oriented education and training.

In the healthcare sector, Finland plans for the major professions, including doctors, dentists, pharmacists, nurses and midwives based on econometric models + stakeholder involvement. This has been done systematically since 1992. The Finnish planning system on health professionals is satisfactory in many respects, and it is built on the national database system. The system is used as



a planning and as a monitoring information system. Their data needs and usage are slightly different.

Data coverage, data types and data collection

Finland has an extended pool of data for health professionals which is also shown by the fact that it is among those very few countries that report data in all of the three status categories (Licensed to Practice, Practising, Professionally Active) in all of the five sectoral professions to the Eurostat-OECD-WHO Joint Questionnaire. In fact, Finland has the most multi-sectoral monitoring of the labour market situation of professionals in the EU; basically for all those who have earned a degree in any higher education institute in Finland.

Calculations in Finland are run by 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 and regional councils. The Ministry of Education has the final say and basically it is the labour market that justifies these decisions. For health professionals, the Ministry of Health monitors the situation. The stakeholder organisations do the monitoring in all sectors, monitoring surpluses or shortages. The strategic National Institute for Health and Welfare is basically a tool for the Ministry of Health for this monitoring activity, but the final responsibility in healthcare lies with this Ministry. The Ministry of Health discusses its standpoint with other stakeholders and then in turn takes its recommendations to the Ministry of Education.

For monitoring, there are several separate data collections and productions. Since all health professionals have to apply for a licence/authorisation to practice in the health profession, there is a strong reason to be registered at Valvira (the National Supervisory Authority for Welfare and Health), the government organisation responsible for practising and legal rights. This is done by the professionals themselves after their basic information is automatically sent to Valvira from educational institutions. There is an ongoing information flow within the system, not limited to the people who have gained, renewed or lost their licence. In Finland the licence is lifelong, unless the licence can be withdrawn by Valvira. There is also a public database for citizens to check if a certain person has the right to practice a health profession.

The Valvira database does not show if a person really practises her/his profession. This is done by Statistics of Finland, which combines information from several sources. These Employment Statistics are an “integrated database” in which data from employers (“where do people work”), taxes and income (“where the main income is from”) and education and degrees (“who has an exam at what level”) is combined. Almost all of the people living in Finland (more than 4.2 million of the total population of 5.5 million) are in the “Register on Degrees and Education” which is regularly updated. One of the information sources is Valvira, but the registry at Statistics Finland is larger and uses other sources as well.

Although containing a time lag of 2-3 years, this integrated database is able to answer important questions such as the number of professionals active in their own profession in Finland. This includes information on unemployment and retirement, as well as on maternity leave, etc. The

main purpose is to follow trends such as the need for new entrants to the labour market, and not to handle day to day problems at hospitals or the regional level.

In addition to the registration system and Statistics of Finland, there are other organisations involved in delivering additional data to the information system. For several specific segments of the health labour market, some additional data is collected, mainly with surveys on representative samples. These include surveys by the Finnish Medical Association (FMA) for physicians and by the Finnish Dental Association for dentists to discover regional shortages. The shortages survey for all professions is done by Local Government Employers (KT) for physicians in hospitals every year and for other professions every two or three years. The latest is from 3/2012.

All of the monitoring data provides direct feedback into the planning process. The first phase is the VATTAGE model that is based on Finnish SNA (System of National Accounts) and its data production. For planning purposes, the Mitenna model uses as its base the VATTAGE model. Mitenna uses information from several data producers but mainly those by Statistics of Finland. For the Mitenna model, the same procedures and principles are in use as those that apply to the monitoring data system.

Trends in HWF

In Finland, the current long-term forecasts regarding demand for labour cover the period of 2008-2025. The workforce demand projections of the Government Institute for Economic Research comprise three different scenarios. According to the target scenario, on average about every fifth new job in the next 15 years will be created in health and social work. This means that there will be around 235,450 job vacancies in health and social work in the period of 2008-2025. One scenario predicts that the number of employees in the healthcare sector should rise by 57 % to meet this demand. In the newest report from 2014, it is reported that in 2030 there will be 450,000 social and healthcare workers working in the field. From 2012 to 2030, the number of employed will grow by about 77,000 people, of which approximately 65% will be working in the public sector (if the development in the production structure of the industry remains unchanged).

Gaps within MDS, HWF Planning data and process

Areas		Supply				Demand	
Category	Labour force	Training*	Retirement**	Migration - Inflow	Migration - Outflow	Population	Health consumption***
Profession	Yes	U.d.	Yes	Yes	Yes		
Age	Yes	U.d.	Yes	Yes	Yes	Yes	Yes
Head count	Yes	U.d.	Yes	Yes	Yes	Yes	Yes
FTE ¹	Yes, partly						
Geographical area	Yes	U.d.	Yes	Yes	No****	No	No

Specialisation	Yes	U.d.	U.d.	U.d.	U.d.		
Country of first qualification	No	No	No	No	No		
Gender	Yes						

U.d. = under development

* Training: Currently under review and development but it is necessary to know all these details:

Profession, Age, Headcount, FTE, Geographical area, Specialisation, Country of first qualification, Gender

** Retirement: Geographical area when retiring occurs, not where the retiree is living...

*** Health Consumption models use data on current health expenditures and health service use by gender and age

**** Migration - Outflow: Geographical, not looked at yet, but it could be possible according to the latest workplace (previous year). To which NUTS level is there a need to go? Most likely it is possible to go deeper.

¹FTE: Can be evaluated through a calculated formula separately for women and men. Not an exact follow-up of working hours.

²Specialisation: all the categories are under development, with uncertain results.

³Country of first qualification: at the moment there is no data available.

The use of qualitative data is regularly carried out in Finland. 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 - evaluated as a content analysis - focusing on 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.

Some challenges for the Finnish HWF Planning system:

- Finland plans for the total number of medical doctors, but it still lacks the necessary data structures to have detailed planning for specialist doctors, a gap Finland is now planning to overcome. The Ministry of Social Affairs and Health has assumed responsibility for education in 2015. It appointed a work group for this and the work began in autumn 2015.
- The Finnish system also faces a relative lack of the application of qualitative data in the planning system and also a lack of complementation of quantitative data with qualitative data.
- Another gap in the data system comes from the application of “age limits” in Finland where the age limit is 64, i.e. those working above 64 are not reported in the “Licensed to practice” category. In other words, those above 64, even if they are actively practicing and have the necessary licence, are still not reported as licensed.
- As far as HWF mobility is concerned, it is monitored and taken into account when planning, but not directly through the planning models.

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Germany

History of HWF Planning

In Germany, the healthcare system is characterised by the 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 a distribution of seats for physicians practising under statutory health insurance, medical school admission at universities (under control of the ministries for education, not the ministries of health), and specialist training. While nursing professions are not included in the planning system, there are two mechanisms that indirectly control supply: nursing schools set limits for annual entry to their education, and hospitals have individual plans for how many nursing positions they offer.

For physicians, planning activities have been in place since 1960 (with indirect control), but some type of planning occurred prior to that, too. Since 1986, a law provides regulation to control the oversupply of doctors. The aim of the planning mechanism was originally to prevent oversupply, and only since the 2000s have there been discussions of undersupply of physicians and unequal rural/urban distribution.

Planning is a self-regulatory process, which is based on negotiations by corporate actors. There is no centrally-directed health workforce planning and neither a national institute responsible for planning. For contracted physicians, the Federal Joint Committee (*Gemeinsamer Bundesausschuss, GBA*) defines a framework, the needs planning directive (*Bedarfsplanungsrichtlinie*), which then guides state-level plans. The main characteristic of the planning is the definition of target ratios for physicians per population (according to specialist groups), which can be slightly altered to account for regional differences (rural/urban areas). The actual ratio numbers can be easily compared to the given target ratios, so that slight interventions can be applied. If actual ratio numbers compared to the target numbers show an oversupply, restrictions on new practice openings may take place; in case of undersupply, incentives can be introduced. The planning mechanisms for dentists are similar to those for physicians.

Regional stakeholder discussions are guided by the guidelines of the needs planning directive and can only slightly deviate from the targets. Since the entire system is self-governed, agreement between stakeholders (the corporate actors) is the major form of regulation.

The ratio numbers were first defined in 1990. An updated guideline was published in 2012-2013 by the Federal Joint Committee, which was then reviewed by the Ministry of Health. Actual planning is done at the regional (state) level. There, the health insurance providers, the departments of health, chambers of physicians, and hospitals are included in the planning process and negotiate. Both public and private service providers, as well as private and public financing, co-exist in the German healthcare system. Planning processes take place only in statutory outpatient and hospital-based care (for dentists only in statutory ambulatory care), and sickness funds also play an important role in the healthcare and health workforce planning negotiations.

The objectives of the planning cover the provision of sufficient supply, the prevention of oversupply, and the intent to eliminate regional and rural-urban imbalances. However, while there are planning mechanisms for medical education entry and places in specialist training, these are not linked with the ratio numbers mentioned above. Planning does not aim specifically to adapt to future demand, either. Hospital capacities are also planned by the individual states, where the number of hospitals and number of beds are defined by specialty, although hospital capacities are not considered an influencing factor when defining physician/inhabitant ratio numbers.

The planning for physicians is carried out for four physician categories (in each group there are several specialties and ration numbers are defined for each speciality): general physicians, general specialist care, highly specialised specialist care, and separate specialist care. 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.

Data coverage, data types and data collection

Various data providers own data related to the health workforce, but not all of them participate in the planning process. The Ministry of Health checks and approves the guideline for statutory health insurance physicians and dentists. The Ministry of Education is responsible for access to university education, which is a separate mechanism.

The planning guideline is published by the Federal Joint Committee, which is made up of the representatives of the national association of statutory health insurance physicians (and the same organisation for dentists), the German hospital federation and the organisation of the health security insurers. The planning itself takes place at the regional level, where the negotiating partners are health and social security insurers and the associations of statutory health insurance physicians. Organisations representing health workers or employers are part of the self-governance in the sickness funds, so they can be indirectly involved in the process.

Representatives of regions have only been involved in this process since 2012. Healthcare expert groups can be included in this planning process too, although there is no formalised way of external expert selection.

For data collection there is an Information System belonging to the Federal Health Monitoring in Germany, but many other sources collect data for a profession or at the regional level.

Regarding the supply side, data on basic training is available at universities and the German Medical Association (*Bundesärztekammer*) is responsible for specialist training, however, neither of these data are used for planning purposes. Professional certifications are registered at the state level (there is a department in each state). A reasonable amount of data is available on the labour force at the Federal Statistical Office. The number of full-time and part-time employments, the distribution in hospital and ambulatory care, the nurse-physician ratio, age structure and geographical distribution of health workforce (down to the sub-regional level), and the supply in rural and urban areas are all registered, but reference values for these variables are not set, hence they are not really used for planning.

Data on the health workforce flow is available from different data sources. The Federal Statistical Office captures immigration data, while Federal Employment Agency information on emigration and retirement is collected by the chambers. Projections for foreseen retirements are not channelled into the planning process. Another indicator for flow is the difference between the numbers of licensed to practice and practicing physicians, but there is no information where these doctors have gone or what they do.

On the demand side, data on population is taken into account for planning with a demographic component of age structure. Data on morbidity and GDP growth is also available at the Federal Statistical Office, but it is not included in the planning process. However, a demographic factor acknowledges a potentially higher morbidity profile in planning regions with a larger elderly population.

Gaps within MDS, HWF Planning data and process

First of all it should be noted that we define gaps as the deviation between a desirable outcome and an existing system. In cases where comprehensive planning is not the system's goal, differences compared to the MDS cannot be defined as gaps that require corrections. The health workforce data collection system in Germany originally did not aim for data collection. From a planning perspective, it can be considered to be a given feature, which can give input for planning. The national characteristics of health systems also determine what type of planning is possible.

One specific feature of the German health system is that private for-profit, private non-profit and public hospitals operate in parallel, and the system in general is a mixed system with a large number of private non-profit providers. Financing of services is independent from service provision, meaning privately insured patients may use public hospitals and vice versa. In addition, fragmented data collections are owned and organised by different stakeholders with strong actors and self-governance. The level of health workforce planning is in line with the system's characteristics, which means that there is not one national HWF Planning process, but instead a strong role for states and stakeholders, further divided by inpatient and outpatient care and by profession.

From the perspective of D051 defined in Joint Action Health Workforce Planning and Forecasting, the first thing that should be noted is that in Germany health workforce planning for the outpatient sector exists mainly for two professions (physicians and dentists). For nurses and midwives, planning is not currently aimed for in the future, and for pharmacists a slight mechanism exists only through the limited number of allowed pharmacies.

Data is collected for each profession individually, and there is potentially more than one data source. It follows that data availability depends on the profession of interest. For example, there are no existing registries for nurses and midwives, which means that exact data for nurses and midwives licensed to practice cannot be provided, thus limiting the available datasets for planning. Compared to MDS, stock data is largely available for physicians and dentists in Germany. Labour force data containing information about age and specialisations is available for headcount following geographical distribution. FTE is calculated from the number of full-time and part-time employees based on the number of hours of a standard labour contract. Data for professionals in training is available at universities and states, but it is not channelled into planning, and labour force data is not used for planning of university places, either. Data on retirement is available at professional chambers. Data on each aspect is available, but not used as a reference value for planning, and projections are not made on “how many professionals will retire.”

Regarding international mobility indicators, three types are used: born abroad, nationality and foreign-trained. The number of foreign-trained health professionals, which is a preferred indicator by the MDS, is available only as a proxy indicator based on the highest training certificates/diplomas at the date of entry into Germany. This data is collected based on whether the highest training certificate/diploma was acquired in Germany or abroad, but it does not give information about every single country. Nationality is the indicator most frequently used, as the German Medical Association provides an annual list of physicians of foreign nationality working in Germany. Information on birthplace and country of training is provided from the German Microcensus data, but there are too few dentists and pharmacists in the sample for making a correct estimation for the number of foreign-trained dentists.

Outflow data is also available for physicians and dentists. For dentists, it is provided by the German Dental Association and the quality of information depends upon the practice carried out in each individual state. Return migration is not recorded, and there is no data about the doctors who returned to Germany after practicing abroad.

Mobility data is currently not used for planning purposes but increased data monitoring for migration is planned; there are on-going projects for forecasting migration trends and further projects are planned for using mobility data for supply and demand projections.

Population characteristics (number of inhabitants, geographical distribution and age structure) are used in defining physician-inhabitant ratio numbers. Regarding health consumption, the utilisation of health services is measured in health insurance refund points for population group, but this data is not included in the planning model.

In summary, most of the elements of the MDS are collected in Germany, however, most of them are not used for planning. For creating ratio numbers, which are the main outputs of the German planning system, all necessary data are available. The lack of some types of data is present for different professions, e.g. outflow data for nurses and midwives.

As data sources are held by different actors (and data is collected for different purposes), data linking and exchange between different data sources is a challenge. For exchanging person-specific data, awareness of ethical issues is high: strict data protection rules are present, especially with regards to data from the health insurance funds. The perceived administrative burden and the sophisticated system of self-administration at the state level also hinder data exchange. Although

planning takes place as a negotiation process, complementation of qualitative and quantitative data and triangulation are not currently features of the system.

Regarding planning processes, interaction between different professions is not a systemic feature. Health workforce planning for ambulatory and inpatient care is not connected to controlling entry into medical education (which is the responsibility of universities and the Ministry of Education), however, these processes could possibly support each other well. A strength of the system is that multiple stakeholders are involved and engaged; and the composition of participating organisations is consistent with the overall health system philosophy. Current planning has a strong focus on outpatient care and on supply. Ratio numbers are defined, but other indicators are not used, and regular evaluation has so far not taken place. The current system does not rely on international collaboration.

Areas	Supply					Demand	
Category	Labour force	Training*	Retirement**	Migration - Inflow***	Migration - Outflow	Population	Health consumption
Profession	Yes	Yes	Yes (for MDs)	Yes (for MDs)	Yes (for MDs)		
Age	Yes	No	No	No	No	Yes	Yes
Head count	Yes	Yes	Yes (for MDs)	Yes	Yes	Yes	Yes
FTE	Yes						
Geographical area****	Yes	Yes	Yes, Länder level	Yes, Länder level	Yes, Länder level	Yes	Yes
Specialisation	Yes	Yes	No	No	No		
Country of first qualification	No	No	No	No	No		
Gender	Yes						

*For university, both the number of students and the number of graduates, for professions doing an apprenticeship or schooling, only the number of graduates.

**We assume only the regular retirement starting at age 65, and no other type.

***For flows information is solely from the National Association of Physicians. For the current state, it is possible to gather some data from the microcensus. In general, there are no statistics for nurses and migration inflow/outflow.

****Only at the Länder level.

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Greece

History of HWF Planning

The reform initiative of 2000-2002 was an attempt to confront HWF problems, among others. During the previous decades, legislation refers to and contains issues with regards to the HWF. The health reform plans proposed by the Ministers of Health included measures for planning and the regulation of health services personnel. These measures were clearly defined, moved in the right direction and constituted a significant change to the existing situation. However, they were only partially implemented.

Even though there is a centrally planned ratio between GPs and specialists, or between the various specialties, for the public sector, there is no interest from the specialist's side to deploy in isolated areas (i.e. mountainous areas and islands) making it difficult to address geographical inequalities.

This results in a lack of policy tools for handling and redressing the current imbalance. The Ministry of Health, on the other hand, determines the overall number of doctors that can practice in the public health sector, but does not regulate their distribution between geographic areas, making it difficult to address geographical inequalities (Presidential Decree 87/86). This applies only to the public sector.

Each hospital is established by law, which is published in the Government Gazette (Presidential Decree 87/86). This also defines the number of beds and the number of health professionals (doctors, nurses, administrators, etc.) according to the following percentages in principle:

6-15% medical professionals, 35-45% nursing, 35-40% administrators, calculated according to the number of beds; i.e. 300 beds X 6% doctors=18 doctors, 300 beds X 35% nursing personnel=105 nursing personnel.

These are multiplied by 2-3 for general hospitals, 1.8-2.8 for special hospitals, and 0.5-2 for psychiatric hospitals.



In addition, it is not a negligible fact that after the 1990s, every third doctor who is registered with the TSAY (the social insurance fund for doctors, dentists, pharmacists and veterinarians) has obtained their degrees abroad.

Greece did not pay attention to HWF Planning before 2010. A more sophisticated planning method for HRH should be used according to the scientific community's relevant publications. The Hellenic Statistical Service routinely collects data on the five sectoral professions since the 1970s. The planning process started in 2010, when the MoH started collecting data on the five sectoral professions in order to improve HWF forecasting and planning and monitoring HRH via the Health Map.

The development started in 2010. Since then, the National Statistical Service routinely collects data on the five sectoral professions in order to monitor HRH via the Health Map.

Trends in HWF

Compared to other OECD countries, the number of physicians appears to be extremely high in Greece, since the country has the highest number of physicians per 1,000 people. In addition, while the number of specialists per 1,000 inhabitants is the highest within the OECD, the number of GPs is the lowest in Greece after Poland. Despite the oversupply of doctors, Greek hospitals face significant human resource shortages. It is estimated that there is a need to employ more than 4,000 doctors in public hospitals. The problem is even more significant regarding nursing personnel. Approximately 15,000 nursing positions in public hospitals are not filled.

Greece faces significant numerical and distributional imbalances with respect to healthcare personnel. Doctors are concentrated in large urban areas and there are shortages in specialties such as general medicine.

Greece was hit very hard by the economic crisis. The health budget decreased by €1.4 billion in 2011. Greek physicians' salaries, which already ranged near the lowest EU average before the crisis, dropped further. According to an announcement of the Athens Medical Association (AMA) issued in 2012, there has been a five-fold increase in the number of specialised Greek doctors migrating abroad compared to 2007, i.e. 1166 v. 292. According to the same report, one out of three doctors with membership in the AMA (the largest association in the country) appears to be either unemployed or only employed part-time, or has already migrated abroad, whereas four out of five young doctors face similar working conditions. To date, no policies have been introduced for better workforce planning and Greece continues to endure a high training cost for a workforce that possibly exceeds its needs.

Data coverage, data types and data collection

The data collection covers most areas of the MDS as well as all of the other sectoral professions:

Areas		Supply				Demand	
Category	Labour force	Training	Retirement	Migration - Inflow	Migration - Outflow	Population	Health consumption
Profession	Yes	Yes	Yes	Yes	Not systematically		
Age	Yes	Yes	Yes	No	No	Yes	Yes
Head count	Yes	Yes	Yes	No	No	Yes	Yes
FTE	Yes						
Geographical area	Yes	Yes	Yes	No	No	Yes	Yes
Specialisation	Yes	Yes	Yes	Yes	Yes		
Country of first qualification	No	No	No	Yes	Yes		
Gender	Yes						

Gaps within MDS, HWF Planning data and process

Data collection limitations/development opportunities:

- increase the quality of the respective statistics
- clear definitions adopted in the national legislation
- cooperation by professional associations

The monitoring system is quite satisfactory.

The leadership of the MoH has to taken into consideration two issues:

- There is a quota of 1:10 and 1:5, meaning that for every 10 retirements or leavers (administrative services) they may hire one new employee while for doctors and nurses it is five retirees/leavers for one new employee (by agreement of the Greek Government with our supporters, the IMF and the European Union). Later on, doctors and nurses became exempt so it is actually 1:1.
- The available budget (Ministry of Finance)

Due to the financial crisis and in the framework of cost containment policies, the public sector redefines needs per public health organisation annually.

With regards to the applicability of planning, it is needed to enhance the efforts towards quantifying demand with respect to doctors and nurses. The issue of sustainability is not particularly determined by the bureaucracy, but Greece is also facing an economic crisis.

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Hungary

History of HWF Planning

The need for establishing a HWF planning model in Hungary has already been recognised by health policy at the national level. Although systematic workforce planning has not yet taken place in Hungary, significant efforts were made to establish a Human Resource Monitoring system, where all the available data from different data sources is channelled into one human resource monitoring data warehouse. For creating the system, strong support at the policy level, technical expertise, legislation and IT solutions were all essential. The legislative framework was created in 2009, when the aims and the data content of the HR monitoring system was codified in the Act on Health (Section 114, Act CLIV of 1997 on Health), and detailed rules were regulated in a Ministerial Decree. The Office of Health Authorization and Administrative Procedures (OHAAP; the name of the institution changed to the Health Registration and Training Center as of March, 2015) operates the HR monitoring system, where IT solutions were developed. HWF monitoring and planning activities are supported by the knowledge centre of the Health Management Training Centre, Semmelweis University, where analysis, research and international collaboration take place. A wide stakeholder network (consisting of the representatives of data providers, professional organisations, universities and employers) is established and kept informed about recent HWF trends and developments. The development of an HR monitoring data warehouse was completed in 2015. During the development phase data content and the structure of the monitoring system were revised, and legislation changes (Ministerial Decree 2/2014. regulates the data content of the HR monitoring system and the structure of the public annual report about the health workforce) were implemented. New legislation on the reporting system makes it compulsory for healthcare providers to report all qualified staff (total coverage is aimed, in the public and private sector, for employed and contract health professionals).

Workforce planning activities are carried out at the education and training level by a quantitative approach, but without using a precise model. The number of university places is determined by the



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State Secretariat for Education, taking into account current labour market trends (including trends in international mobility), and the predicted growing population needs for the future. Residency quotas are determined by the State Secretariat for Health of the Ministry of Human Capacities. An overall number is published without any division between professions, and filling in the posts is based on an agreement between hospitals and trainees, so that the current need on the market is mirrored in this qualitative mechanism. An occupation shortage list is also determined and revised annually, and those who are willing to participate in specialist training in a shortage profession receive financial support. There are no defined numbers in the field of vocational training; the number of trainees is highly affected by the training market conditions.

Trends of HWF

According to official statistics, there were 31,454 medical doctors in Hungary in 2013. This means 3.17 medical doctor per 100 inhabitants. There are tremendous trends in Hungary influencing the operation of the HWF, and thereby the sustainability of delivering healthcare. The ageing of the population and the HWF itself can have significant consequences for the future. For example, as the HWF ages, GPs tend to work for years beyond retirement age. The most important challenge in front of the Hungarian healthcare system is the ageing of not only medical doctors, but the entire healthcare staff. The average age of medical doctors is more than 50 years, and similar trends can be witnessed among nurses.

Another important trend is the increased level of mobility of health professionals. The numbers in outflow used to reach higher levels until in 2013, due to governmental interventions, the increasing outflow declined. The retention policy showed significant results, and the numbers are carefully monitored, however, we are aware that the migration potential has not decreased among medical students.

Due to the ageing trends and high amount of outflow, the lack of new generations can endanger the sustainability of the Hungarian healthcare system in the long-term perspective.

An additional significant issue is the inequality in territorial distribution of the health workforce. The total number of the health workforce is already low, but it is critical in several areas, especially in general practices and city hospitals in small towns and rural areas.

Data coverage, data types and data collection

The OHAAP is the authority responsible for maintaining the mandatory Basic and Operational registry, recognition of healthcare specialisations, issuance of conformity and good standing certificates and the operation of the healthcare HR monitoring system. As the basic registry encompasses individual data, general personal information and all the details of the qualifications are recorded. The registration needs to be renewed every five years, and health professionals have to certify that they have enough CPD credit points (by participating in conferences, publishing activity, and continuous professional trainings) in order to be licensed to practice. Registration in professional medical chambers is mandatory too, although data from chambers is not channelled into the HR monitoring system.

The basic concept of the HR monitoring system is to channel all available data on HR from different data sources into one place, where data linkage can take place in the near future. This monitoring



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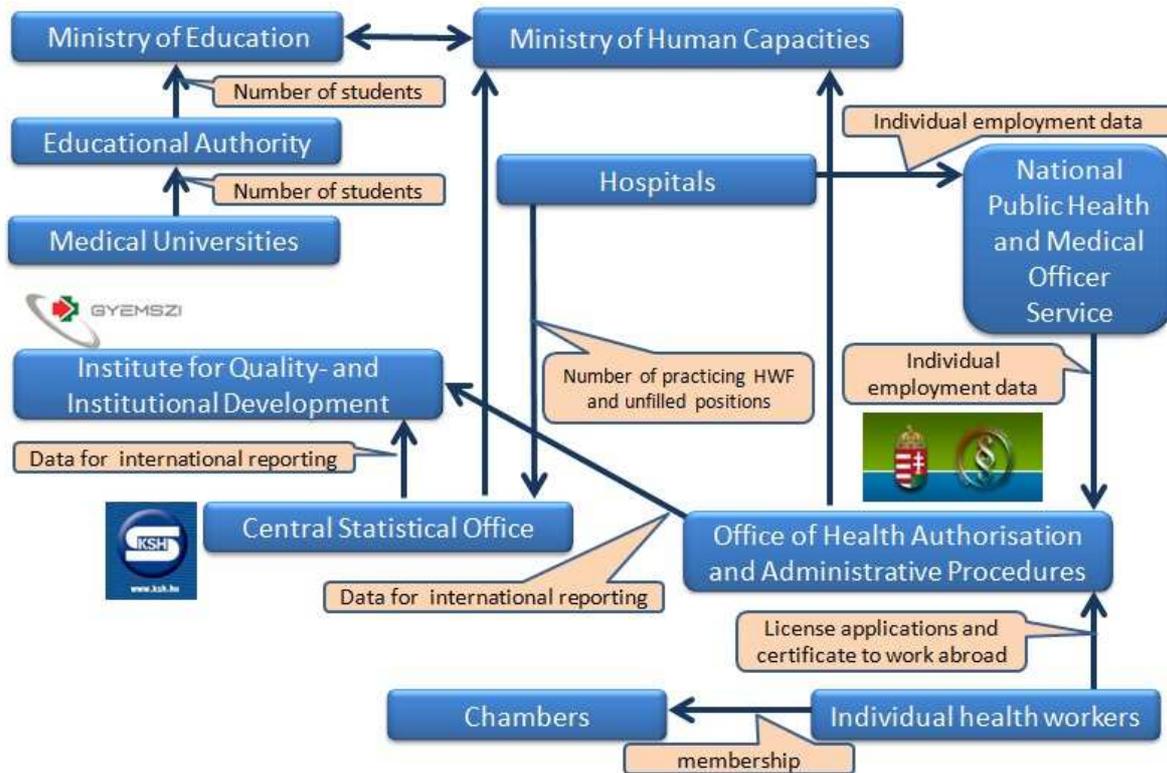
system is set up from individual records (data protection issues are strictly taken into account) and this structure provides the opportunity to produce various reports on different aggregate levels. The most significant data types (individual data content) are the following: age, gender, nationality, birthplace, qualifications, specialisations, licences (all from the registries), healthcare activities (by healthcare providers), prescription habits (for physicians, by the Health Insurance Fund), data on primary care providers, information about residency training and scholarships, continuous professional development, diploma recognitions, certificates of conformity and good standing, and reported leaves. The HR monitoring system also contains data which is available at the aggregate level only: the number of graduate students (from universities), number of health professionals in vocational training, data on average wages and wage structure and the number of employments (filled and vacant positions).

Data from registries, on residency training, recognition and certificates for working abroad are available directly from the OHAAP. The other main actors for data provision for the HR monitoring system are the National Public Health and Medical Officer Service, where the individual employment data is generated, the Health Insurance Fund, medical universities and the Central Statistical Office, which produces an annual report on filled and unfilled provisions (based on a data request of healthcare providers). Analysis about wages was carried out by the Institute for Quality and Institutional Development. As of March 2015, this function was taken over by the OHAAP. International reporting (e.g. towards the Joint Questionnaire) is provided by the Institute for Quality and Institutional Development where other, non-HR specific healthcare indicators are measured, so that the maintainer of the HR monitoring system is usually not channelled directly into the international data flow.



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Data types and main actors - a simplified chart about data flow in Hungary.



Data gaps within MDS, HWF Planning data and process

Data from professional registries serves as the basis of the Hungarian human resource monitoring system, which means that - taking into account the data content of the MDS - detailed information on age, gender, profession, specialisations and country of first qualification is available about every registered health professional. Monitoring the practising workforce - which also includes the production of sufficient data on geographic distribution and FTEs - is currently challenging. Although legislation has already taken place for an employment data database (covering the public and private sectors) and data provision for healthcare providers is compulsory, the quality of data highly depends on the provided information and the willingness for regular updates. Calculating FTEs is even more difficult because doctors can work under different legal statuses (employed, contracted) in the public sector too.

Obtained qualifications are registered immediately in the basic registry of the OHAAP, but there is only limited and merely aggregate information available about professionals in training. Retirement

data is not registered; it can be calculated by monitoring renewals in the operational registry, which is compulsory every 5 years.

Mobility inflow indicators (Foreign Trained, Foreign Born and Foreign Nationality) are all available in the registry on an individual basis. For monitoring outflow, only proxy indicators are available, consequently applications for a certificate for working abroad are used for this purpose. Since all of the qualifications are registered on an individual basis, analyses according to various professional categories are possible. A possible source of distortion is that the outflow indicators include those professionals (mainly doctors) who are foreign nationals and returning home after graduating in Hungary.

Regarding the demand side, population age, headcount and geographical distribution data are available at the Central Statistical Office. This data, however, is not channelled into any HWF monitoring or planning process. Population data is taken into account when planning hospital capacities. Health consumption information is not included in the planning activities either. Professional minimum conditions required for the provision of health services are regulated by ministerial decree, which covers the minimum personal conditions necessary for carrying out certain healthcare activities. Theoretically, health workforce demand could be calculated from these requirements, although the determinations for each profession are so diverse that it is not possible to set up a general model. In the Central Statistical Office's annual report, the number of unfilled positions (based on the subjective self-declaration of healthcare providers) is known for each profession, which can serve as another possible source of input for estimating demand.

The main challenges regarding available data are the quality of data (which highly depends on data providers, since data received directly from healthcare providers usually contains more distortions) and the availability of different types of data (mentioned above regarding MDS). Categorisation can create a problem in the case of nurses, where various qualifications exist, so that the validation and simplification of this data is a must. As monitoring is based on registry data, definitions for professional categories can be made according to qualifications, which is challenging taking into account the various different qualifications (all of the obtainable qualifications) registered for nurses and allied health personnel. Data source linking is solved by the development of the data warehouse for the human resource monitoring system.

If we take a look at the process, the most significant gap is the lack of tracking of shortages or surpluses of the HWF (this is connected with data availability). There are many different data collectors involved in the process, and shared responsibilities can make the process less effective. Cooperation between HWF data providers is good, but HWF monitoring at the national level and international data provision are organised differently. Eliminating duplications in the data collection and channelling all of the available HWF data into the human resource monitoring system data warehouse can make significant improvements. Shortages in financial resources and limited technical expertise on the part of responsible authorities can also be considered as a gap. Since support for the policy is considered to be high, however, several initiatives are on-going, but not in a systematic, strategic way. Determining the higher educational places is the responsibility of the

State Secretariat for Education. In this process, the needs from the healthcare sector should be taken into account more precisely, and enhanced cooperation between the two sectors would be helpful for HWF planning.

We are convinced that valid and up-to-date data is essential for quantitative planning. We have learned that defining the necessary input and writing legislation is not enough. Although there is a well-built database for qualifications and licences, tracking practicing health professionals is challenging. Various efforts have been already made to have data on employment, but they have to be supported by clear legislation. IT solutions and incentives for healthcare providers are also necessary.

Areas	Supply					Demand	
	Labour force	Training	Retirement	Migration - Inflow	Migration - Outflow	Population	Health consumption
Profession	Yes	No	No	Yes	No		
Age	Yes	No	No	Yes	No	Yes	Yes
Head count	Yes	No	No	Yes	No	Yes	Yes
FTE	No						
Geographical area	No	No	No	Yes	No	Yes	Yes
Specialisation	Yes	No	No	Yes	No		
Country of first qualification	Yes	No	No	Yes	No		
Gender	Yes						

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Iceland

History of HWF Planning

The HWF Planning structure in Iceland is fragmented and not regulated by law. The first published report on HWF forecasting that was commissioned by the Ministry of Health (Now Ministry of Welfare) was done by the Institute of Economic Studies in 2006. Since then simple forecasts have been made for part of the HWF by the ministry. Other actors have made forecasts to serve their own needs, i.e. Landspítali - the National University Hospital and the Medical Association in co-operation with the Nordic Medical Working Group on workforce prognosis and specialist training issues (Samnordisk arbetsgrupp for prognos- och specialistutbildning - SNAPS).

The resources devoted to HWF Planning are limited. There is no workforce devoted solely to the task and health workforce mobility is not measured systematically or regularly in Iceland. However, the health authorities react to individual reports on workforce shortages and attempt to address the geographical dispersion of the health workforce through various methods. Iceland feels the need to monitor and forecast and ensure quality assurance and availability, while ensuring that health needs are met and patients can access the best quality treatment. The planning structure reflects the small population of the country, with an emphasis on consultation with stakeholders, thus qualitative methods are noteworthy in Iceland. The Directorate of Health (DoH) collates data on health workforce headcounts to help estimate for the likely future needs, although triangulation is not used systematically. The DoH consults with health institutions in the country and professional associations, before making recommendations to the Ministry of Welfare regarding the status of the HWF. The decision about the number of places available for training at the universities does not rest with the Ministry of Welfare (MoW), but with the Ministry of Education, Science and Culture (MESC) and the universities themselves. However, the MoW does recommend and consult with the MESC.

There is currently little focus on the demand side for HWF Planning. On the supply side the focus is on the number of health professionals and the fiscal budget (GDP). Two main supply-side methods are used in the physician and nurse categories: monitoring retirement scenarios and graduation rates. The need for dentists, midwives and pharmacists is monitored by basically the same method.

On the demand side the need of the nation is taken into account, including care pathways and demographics, such as population size, age and gender structure. Health productivity, delivery and utilisation are measured but not always included in HWF Planning.

Retirement and training are the most important factors in HWF Planning. The statutory and actual retirement age of state-employed health workers is 70 years, but the official retirement age is 67 for both genders. The most common retirement age is between 60-70 years of age. In private



practice, the retirement age is 75. To continue after that, a licence that can be valid for up to three years is required from the DoH. After that, a renewed licence is valid for one year at a time. The average effective retirement age is 70 years for men and 65 years for women. According to new estimates, the demand for nurses in 2020 might not be met, since 25% of nurses are 55-64 years old, and will have left the workforce in five to ten years time. In terms of training, a numerus clausus exists for the intake of medical students, nurses, midwives, physiotherapists and dentists, based mainly on the number of places for clinical practice available. There is little attempt to steer young doctors into specialties that are under-represented. The time horizon for change is 15 years. Data collection and evaluation is continuous, discussions among stakeholders leads to decisions and admission to schools, or the reorganisation of the type and supply of services.

Data coverage, data types and data collection

The actors involved and responsible for data collection, monitoring and policy delivery are: Statistics Iceland, Professional chambers, the Directorate of Health and the Ministry of Welfare, and the DoH have a Registry of Health Services in the country. The Registry holds information on headcount, age/date of birth, gender, date of registration/licence, profession, certification, nationality and residence. It does not have information on activity status or country of practice. Mandatory registration supports HWF Planning in Iceland and the data is national. More detailed information is available for state-employed professionals on the place of work, professional activity and FTE, than on professionals working in private practice. In total, there are 33 licensed HPs, and at least the five sectoral HPs are covered in the Registry. The DoH also documents (confidentially) whether health practitioners have been reprimanded or had their licences revoked.

The policy making, supervision, monitoring, managerial and administrative responsibilities of leaders were defined in The Act on Management of Healthcare Organizations from 2007. The objectives of the Act are to ensure quality and clinical standards, the organisational landscape of healthcare policy, the types of services required, the allocation of resources, information gathering and data analysis. Later, the Healthcare Practitioners Act of 2012 aimed to facilitate cooperation within the healthcare system, define field of work with the goals of ensuring high quality of care services, patient safety by defining educational requirements, knowledge, practices and skills.

Trends in HWF

The supply of the healthcare workforce is generally well balanced. There are enough doctors, nurses, nurse assistants, etc. There exist, however, fluctuating shortages in certain specialties (e.g. GPs, surgical nurses, psychiatrists, paediatricians). Iceland's small size makes it vulnerable as it cannot uphold the capacity to educate HPs in all specialties of medicine and other professions. Thus approximately 90% of doctors and a smaller portion of nurses, pharmacists and dentists go abroad for specialisation, knowledge exchanges, or for professional development. At any given time approximately a third of the total physicians are abroad and previously most of them returned home (80%). Doctors move to the Nordic countries, the UK, the Netherlands and the United States. Going abroad part-time or regular commuting is well known and increasingly popular among Icelandic doctors and nurses due to higher wages and better working conditions abroad. The phenomenon of

having full-time jobs abroad and long-term migration has been known for years. These are mostly doctors that do not return after their specialisation.

A relatively new trend (the last two decades) has been for a part of medical students to go abroad to get their basic medical education. Most of them go to Denmark, Hungary and Poland.

In the next 5-10 years a shortage of nurses is predicted if not addressed now (given the large number of nurses going into retirement during that time). There is an experienced undersupply in midwives and nurse assistants and a severe undersupply of medical laboratory scientists. Feminisation of the HWF is characteristic, as approximately 80% are women. The financial collapse and the economic crisis had a significant effect on the HWF, as the previous slight growth in HPs decreased and important cost-saving measures were introduced.

Since 90% of doctors go abroad for specialisation, it is challenging to track HPs and Iceland does not hold information on the type of specialisation the doctors are trained for. Since there is no data on the size of the flow of Icelandic doctors to foreign schools, it is not possible to capture significant and representative information on doctors' specialisation outside of Iceland.

Monitoring HWF mobility is challenging, but there are indicators through the DoH registries on the number of those going abroad for work or training and on the number of returns. Still, Iceland aims to be able to plan ahead and have balance in the national workforce, and to be ready for changes in Europe that influence the national situation. Nowadays, improving documentation and mandatory reporting by professionals about country/countries of work is in progress at the DoH. It is problematic indeed, to retrieve information about doctors going out of the country for specialisation, and coordination and cooperation between actors needs to be improved.

Gaps within MDS, HWF Planning data and process

There is a national coverage for the number of licenced HPs as well as place of residence but data for planning purposes is still lacking especially for place of work and activity status. Monitoring students in training and graduating, as well as the retirement data, is considered in HWF Planning. In the case of doctors, nurses and midwives, there is a need for developing and improving data, indicators and to refine models, as limited data and the lack of robust information is a barrier.

On the demand side data on care pathways and demographics are taken into account in HWF Planning. On the supply side no reliable data on attrition is available, and specialist training is only tracked among HPs starting their training in Iceland. Specialty is recorded when people return from their specialty training abroad (DoH issues certificates to foreign nationals and those trained abroad). It is a challenge to get information about where trainees go, and what specialty areas they choose, which means that there is a lack of good mobility tracking to provide reliable data for HWF Planning. Therefore there is no precise knowledge on mobility in spite of the fact that we know that approximately a third of MDs are working or training abroad. The biggest problem reported in Iceland is that there is no obligation or requirements for reporting changes in employment status, and the DoH does not collect data on employment place and time nationally or abroad. The financial crisis had a crucial impact on mobility, as more HPs stay abroad which affects current and future capacity. There have been no cost analyses of MDs staying abroad after specialising.

A solution would need a mandatory registering of who is active, at home and especially abroad. Further difficulties are the lack of long-term considerations in HWF Planning. Monitoring of the

HWF is manageable due to the country's size, but difficulties exist in regards to the long time-lag situation and revealing the skill mix (although some ratios are available for nurses). People in charge of HWF Planning are obliged to consult with professional associations, which adds to progress time, moreover a lack of experience and expertise on the part of the planners was mentioned, since there is no specific workforce-planning training in Iceland. The aim would be to enable more sophisticated proactive planning, strengthen political commitment for improving the strategic dimension of the planning system, and take control and amend the current potentially reactive and inefficient policy making.

Continuous data collection and evaluation is aimed for in Iceland. Discussions are necessary, since several actors play a significant role in HWF Planning. Coordination and cooperation, documentation and models still need to be improved and refined in order to have direct and precise information, for example on mobility. On the other hand, the clear definition of roles and responsibilities, and resources dedicated to HWF Planning are lacking. Identified barriers are the lack of resources (expertise, budget, IT solutions), methods and models, structural framework and clearly defined goals for HWF Planning. Better management and organisation, such as clear responsibilities and more systematic processes are needed in, for example, demand quantified for planning, improvement of demand-side approach technology advances, service delivery and work shifting.

Regarding MDs, nurses and midwives, there is sufficient data but it is not complete. Dispersed and isolated clusters of data on the HPs exist. It would be feasible to link them together, but that has not been done yet. Data is available for dentists and pharmacists, which is valid, but there are gaps (attrition rates, substitution or retention), therefore it is not always reliable. Without clear definitions of key indicators, it is difficult to develop precise models.

Areas Category	Supply					Demand	
	Labour force	Training	Retirement	Migration - Inflow	Migration - Outflow	Population	Health consumption
Profession	Yes	Yes	Yes	Yes	No		
Age	Yes	No	Yes	No	No	Yes	No
Head count	Yes	Yes	Yes	Yes	No	Yes	Yes
FTE	Yes						
Geographical area	Yes	No	No	No	No	No	No
Specialisation	Yes	Yes	Yes	Yes	No		
Country of first qualification	No	No	No	No	No		
Gender	Yes						

Note: WP5 templates for all 5 sectoral HPs



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Italy

History of HWF Planning

A National Law (decree n° 502 of 1992) regulates the definition of Health Workforce needs. These laws mainly regulate the aspects of the National Healthcare System. In one dedicated article, decree n° 502 establishes that no later than 30 April of each year the Minister of Health, in consultation with the Standing Conference for the relations between the State and the Regions, the National Federation of the Orders of medical doctors, surgeons and dentists, and other interested professional orders, determines the HWF needs for the National Health Service. The HWF needs, regarding to doctors, dentists, veterinary surgeons, pharmacists, biologists, chemists, physicists, psychologists, as well as to nurses and technical and rehabilitation staff, have to be divided by Regions, with accesses to the Bachelor's degree courses and specialised training schools determined by the Ministry of Education.

For these purposes, the decree mentioned above takes into account:

- goals and the essential level of healthcare indicated by National and Regional health plans;
- healthcare organisational settings;
- HWF supply;
- HWF demand, considering staff being trained and already trained, but not yet working.

Public and Private bodies and professional orders are obliged to furnish the Ministry of Health with evaluation data and elements for the determination of HWF needs for the different professional categories.

Based on this legal framework,

1. The Ministry of Health (Department of Human Resources) every year asks the Regions for their own HWF needs (usually in October or November each year);
2. At the regional level, each Region autonomously defines their own HWF needs and communicates them to the Ministry of Health (in the first months of the year);
3. The role of the Department of Human Resources within the Ministry of Health is to bring together the data and forecasts developed at the regional level, making time and geographical data consistency analyses and comparisons (by March of each year);
4. The HWF needs reviewed by the Department of Human Resources are then presented and discussed with the National Professional boards and the Regions and finally validated (during the first days of April);
5. The result of this process is an Agreement between the Government and the Regions on the annual number of medical University student intakes (by the end of April).

However, the Agreement is not a final decision: it represents the official needs for new admissions at the University that the Ministry of Health and the Ministry of Education will discuss later on, also taking into account the training capacity of the Universities. Finally, the Ministry of Health and the

Ministry of Education sign a joint Decree containing the final decision on the annual student intake (usually by the end of July).

The objective of HWF Planning is to guarantee a constant supply with the hypothesis of a constant demand. The goals of the HWF Planning structure are to attempt to analyse, compare and make recommendations at the national level.

The planning process is a combination of the National and regional levels: The MoH starts the collection of data from Regions and Professional boards (medical and health professional associations). Regions and professional associations estimate the health workforce needs, and regions define their own professional needs (concerning the geographical area or profession of interest). The MoH makes data synthesis, time and geographical data consistency analyses and comparisons of the Regions' and health professional associations' needs in order to define total national workforce needs. At the end of the process a Government-Regional Agreement is reached and the MoE sets the number of new students to enroll in degree courses.

The approach to NHS human resources forecasting is bottom-up (national needs overall are obtained by the amount of single regional needs, for national needs are the sum of regional needs). For the Government-Regional Agreement there is a top-down data check by the MoH and a central government proposal for health professionals' needs.

The national government and the regional actors reach a consensus and an agreement (as a qualitative method, however the main methods are quantitative) and the communication of results goes to the MoE, which is responsible for defining the number of entrants in degree courses.

No separate planning committee has been established at the national level, and there is no established planning model. Demography, morbidity and service delivery are taken into account. For instance, the contracts of specialists are monitored annually to satisfy demand and avoid imbalances, as well as assess future needs. The projection period, data and methodology vary by Region, but cover all health professionals and, for the medical doctors, all the 55 medical specialties.

Aspects taken into account in planning:

- short-term forecasting of healthcare professionals (yearly);
- medium-term forecasting of the number of physicians by specialty (three year time horizon);
- objectives and essential level of assistance indicated by the National Health Plan;
- organisational models of services;
- employment offers;
- work demands, also considering healthcare professionals in training;
- university training capacity

Trends in HWF

The supply of the healthcare workforce is pretty fragmented due to geographical distribution and the strong role of Regions. The number of HPs increased during 1990-2011 (64% women), resulting in a stable trend of 4 MDs per 1,000 population. The nursing profession experienced an enhancement

of its role with the establishment of nurse-led professional groups in primary settings. Dentist and pharmacist trends are rather unstable with peaks, which might be explained by the poor quality of available data. The MD/population ratio is not balanced within the Regions. Northern provinces, with a higher GDP, have lower rates, thus non-economic factors should be taken into account when considering geographical distribution. Regarding mobility, there is little data at the national level. Monitoring the flow of nurses and reporting the composition of the WF was introduced in 2007, however, no reliable national data exists. Estimates report low reliance on foreign MDs (less than 5%). In 2011, there were less than 15,000 foreign doctors licensed in Italy, or only 4.4% of the approximately 370,000 registered professionals. The source countries of the largest groups are Germany (1,070), followed by Switzerland (868), Greece (864), Iran (756), France (646), Venezuela (630) Romania (627), US (617), Saudi Arabia (590) and Albania (552). On the other hand, nurse shortages led to high inflows of nurses of foreign origin (Romania and Poland) particularly migrating to Central and Northern Italy. In 2012, among the new registrations, foreigners were represented in the greatest numbers by Romanians (44%), followed by Indians (10.2%), Albanians and Peruvians (7.6%). An important driver influencing international mobility is the increasing need in the elderly and home care sectors where mainly undocumented migrants are likely to work, thus a piece of legislation, the 'Manifesto for health workforce strengthening' aimed to ease the entry requirements for nurses and bilateral agreements were initiated with Eastern European partners to guarantee the recruitment of qualified HPs. HWF Planning training capacity in health-related education programmes has been monitored since the early 1990s. An over-supply is still prevalent in the case of MDs, therefore MD outflow has become significant to the UK and Germany while MDs from Switzerland, Norway and Iceland arrive to practice in Italy.

Data coverage, data types and data collection

There are several actors directly involved in data collection: Professional boards (Health Professionals Associations), Regions, Universities, and the Ministry of Economy.

Several actors are involved in data reporting: the National Office of Statistics (ISTAT), the Ministry of Health, and the Ministry of Economy. The ISTAT uses three different databases and data sources: the ENPAM National Insurance Institute of physicians and dentists, the Ministry of Health - D.G. of the Health Information System, CEGEDIM ITALIA, the Labour Force Survey, IPASVI (nurses), FOFI (pharmacists), FNCO (midwives), the Ministry of Economy conducts the Conto Annuale Survey, and information is also collected from professional bodies and institutions.

Gaps within MDS, HWF Planning data and process

It is challenging to have a national overview in Italy, because of 1) differences across regions, 2) differences in the amount and type of data collected. Methodology and approaches vary widely. The main barrier is that at the national level, information is incomplete, there is no unified database and no data linking because of regional dominance. The use of multiple different sources at the national and regional levels results in non comparability, and a gap for certain specialisations and the private sector, therefore the analysis is quite complex. Italy has an impressive amount of data, however many data collections occur on an ad hoc basis and they are not systematic, nor periodic. In the data collection, all of the five sectoral HPs are covered, mostly using aggregated data (individual registry data is not used for planning purposes), but data linking of individual databases

is not carried out. The main limitations evolve around the lack of data in attrition or retention. In the private/non-health sector or urban/rural distribution, the lack of data on activity status (practicing HPs, no common indicators measured, e.g. no unique definition for FTE or considering the latest trends), and the lack of precise tracking of HWF mobility (immigration and emigration) might also be highlighted.

Areas	Supply					Demand	
	Labour force	Training	Retirement	Migration - Inflow	Migration - Outflow	Population	Health consumption
Profession	Yes	Yes	No	No	No		
Age	Yes	No	No	No	No	No	No
Head count	Yes	Yes	Yes	No	No	No	No
FTE	Yes						
Geographical area	Yes	No	No	No	No	No	No
Specialisation	Yes	Yes	No	No	No		
Country of first qualification	No	No	No	No	No		
Gender	No						

Note: WP5 template for physicians

The main issues concern the involvement and participation of stakeholders. There is no common, clear and agreed procedure on how to involve many stakeholders, and the lack of a structured communication flow or the unclarity of the aim of HWF Planning can be mentioned. Since there are numerous actors in HWF Planning, finding synergies and better coordination, structured roles and responsibilities are necessary.

Regional fragmentation and the regional health systems have a significant role in the organisation of healthcare in Italy. Regions are responsible for the organisation and delivery of healthcare while the national government establishes the general framework. The legislative competences and responsibilities are shared between the national and regional governments, thus the autonomy of the Regions might hinder the power of national level policy. Another global aspect was identified that influenced health policy development, namely the financial crisis and the national-regional fragmentation in the framework of health reforms. The financial crisis had a noteworthy impact on this issue due to budget cuts and the strong control of the national government in spending, e.g. payment of personnel and recruitment in 2012, thus HPs began to leave the country in order to find more stable employment conditions. Additionally, patients also started to show cross-regional flows, mostly from the South where health systems could not improve their efficiency and efficacy compared to the North.

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The Netherlands

History of HWF Planning

Since 1970, the Dutch government has explored different approaches to determine the inflow in medical training, both for initial training at medical schools and for specialty/vocational training in training hospitals and other training institutes.

For the medical schools, intake was regulated by the medical schools themselves until 1972. By 1972, the popularity of the medical schools had surpassed their training capacity. From 1972 until 1988, intake was set by the Ministry of Health (MoH). From 1988 until 1993, the MoH had a larger role in setting the numerous clauses for medical schools, via a government controlled continuous advisory committee: the national council on public health (“Nationale Raad voor de Volksgezondheid”). When this advisory committee was cut down of this task by the MoH in 1993, the Ministry of Education took direct control over the intake of medical schools through their funding programme. Intake was no longer established on the basis of planning, but mostly on available finances. In 1999, intake in the medical schools became subject to autonomous advice once again with the establishment of the Advisory Committee on Medical Manpower Planning (ACMMP) (or, in Dutch: the “Capaciteitsorgaan”).

For specialty training the situation was slightly different. Except for the training of GPs, up until 2006 specialty training was subject to the individual decisions of all training hospitals, in negotiation with their local health insurers who financed a substantial part of the training costs. With the introduction of the Health Insurance Act in 2006, the MoH took over all training costs from the health insurance companies. The MoH had experience in this area due to the fact that the training costs of GPs were already a part of the budget of the MoH starting with the introduction of specialty training in 1972. As of 2006, all specialty training is financially controlled by the MoH, who closely adhere to the intake recommendations of the ACMMP.

In 2000, at the instigation of the ACMMP, a simulation model for health workforce planning was developed (technically by NIVEL) to estimate the required and available capacity of health professionals in the Netherlands. The goal of this model is to measure the current gap between the required and available number of health professionals and to assess the expected balance for the next 10 to 20 years. Consequently, the intake in medical schools is also determined in order to keep stock of the medical graduates waiting for intake into specialty programmes.

The model can best be classified as a demand-based model, as workforce planning is not only derived from the inflow and outflow of health professionals, but also through projecting future demand for a certain medical specialisation (for example, GPs). The model can be used for all types of medical and associated health professionals, since the model is designed to be “one size fits all”. The health workforce planning model forecasts the demand for physicians in the Netherlands for nine different scenarios over the next 12 to 18 years, and consequently estimates the corresponding yearly intake in each of the 35 medical specialty training programmes to match the calculated demand.

Data coverage, data types and data collection

In the Netherlands, the main data collection institutions are the statistical office and the registration bodies, both for licensed professionals and for professionals in training. Registration is



compulsory in order to guarantee quality, and has to be renewed for medical specialists every five years. The scope of the data covers doctors, dentists, midwives, nurses, pharmacists and psychotherapists. The range of stock data covers headcount, age, geographical distribution, employment type (FT/PT), qualification and specialisation. Data collected on the current stock of HWF allows us to know the number of active professionals, number of full-time equivalent (partly measured by asking the specialists themselves), types of providers, where they work, their skills, the services they provide, workloads (not collected explicitly as such, since this is interpreted multiple ways in the Netherlands), as well as gender and age. The flow data cover inflow based on equivalence certificates.

Areas	Supply					Demand	
	Labour force	Training	Retirement	Migration - Inflow	Migration - Outflow	Population	Health consumption
Profession	Yes	Yes	Yes	Yes	Yes		
Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Head count	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FTE	Yes						
Geographical area	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Specialisation	Yes	Yes	Yes	Yes	Yes		
Country of first qualification	Yes	Yes	Yes	Yes	Yes		
Gender	Yes	Yes	Yes	Yes			

Labour force: based on the “current” numbers of registered professionals in the Netherlands, with an estimate in terms of whether they are active in the Netherlands based on the “past” shares of professionally active professionals (time lag: ± 2 years) according to the integrated database of Statistics Netherlands and/or more recent surveys.

Training: based on data from educational institutes for initial training and registration data for specialty training. For medical specialties, detailed data are available for analysis; for initial training, aggregated data are available.

Retirement: based on professionals losing their registration and/or an estimate in terms of whether registered professionals are not active anymore in the Netherlands. In essence it is an indicator of the “outflow” out of the Dutch labour force for reasons such as retirement or others (changing career, migration, etc.).

Migration inflow: based on registered professionals, with an estimate whether they are active in the Netherlands. It is often hard to say, however, how many people have entered the Dutch labour force.

Migration outflow: based on registered professionals, with an estimate whether they are active in the Netherlands. It is often hard to say, however, how many people have left the Dutch labour force to go work abroad.

Population: based on municipal registers.

Health consumption: Based on several types of registrations or surveys. It is sometimes hard to get data on health consumption for each profession or specialty.

The Dutch information system on health professionals can be considered to be satisfactory based on the following points:

- The main registration systems have a strong legal base (“Wet BIG” - the law on professionals who are involved in individual healthcare delivery). This law ensures cooperation on several

levels of the system, both between licensing organisations (mainly run by professionals themselves) and the government.

- Key stakeholders are engaged in the registration system and take the registration process seriously. This is the case not only for all individuals and organisations involved in its direct control, but the system is also taken seriously by all individuals and organisations.
- Information from several sources is combined by Statistics Netherlands. This has led to an “integrated database” in which data from municipalities, taxes and registrations are combined. Despite the considerable time lag of about 2-3 years, this integrated database is able to provide answers to important questions.
- Statistics Netherlands and other organisations are involved in delivering additional data to the information system. For several specific segments of the health workforce, some additional data is collected, mainly with surveys on representative samples. This additional data collection is often initiated or at least funded by the government.

The Advisory Committee on Medical Manpower Planning (ACMMP) has specific information needs, so they have intervened in the system to make it more capable of delivering the data that is needed for planning purposes. They also fund additional data collections to answer specific questions in HWF Planning.

Trends in HWF

The health workforce has increased by over 35% during the period 2000-2010 (The Netherlands employs a higher proportion of staff in relation to their population). This increase seems sufficient to cope with the population increase of 2.2%. However, demand for healthcare has increased because of a number of factors, e.g. social-cultural trends, technology and ageing, but ageing is not the most important factor. It can only account for 25-30% of the total increase in health spending and workforce.

Workforce Trends are different across categories. The greatest increase in supply are the medical specialists that have the elderly as primary patients (e.g. cardiologists, ophthalmologists, nurses, mental health physicians). In general, supply seems to match demand in a small country like the Netherlands. However, the labour market in the health sector is a regional one and there are some regional small gaps. Moreover, there are issues related to supply matching the demand for GPs in large cities.

The physician and nurse ratio are well above the EU average. The dentists and pharmacists ratio are well below the EU average. The care workforce is 8% of the working population, which is a relatively high ratio. The Netherlands has to cope with the decreasing number of graduate pharmacists. There are currently notable specialist shortages for the mentally disabled and in geriatric medicine. Also it is expected that in a few years there will be a shortage of nurses in homes for the elderly and in nursing homes.

Gaps within MDS, HWF Planning data and process

Concerning the data collection process, the strengths of the Netherlands' planning system is its explicit and clearly defined goals, the integrity and flexibility of the forecasting model, the standard use of nine scenarios, the existence of comprehensive data sets and methods, the strong link between HWF Planning and policy actions, and the organisation and level of involvement of stakeholders.

Some limitations, however, can be identified, including the unpredictability of the future, the difficulty to cope with the differences between need, demand, and use, and the timeliness of the data (data are usually one or two years old). Although data on the "current" demand and supply are available (with the abovementioned time lag of one or two years), it is still at times difficult to know the exact amount of shortages or surpluses in the HWF. Tracking shortages and surpluses is considered to be the second biggest challenge of the Dutch data collection process.

Concerning information flow failures, a medium level limitation is caused by the fact that some professions seek to reach their long-term professional goals through merely increasing or limiting their numbers. Engaging policymakers also means a level of challenge, as decision makers have to consider political and financial constraints besides the recommendations given by the ACMMP. The ACMMP therefore always includes a range in their intake recommendations, based on two different, but likely scenarios, in order to give the policymakers leeway.

Assessing the future demand for care is considered to be the most significant challenge of the data collection process, as the future demand for care based on demographic, epidemiologic and sociocultural interpretation of utilisation data is exceptionally dependable, but a paradigm shift cannot be taken into account.

The changes in demand for the health workforce are rapid and at this moment barely quantifiable. The most important changes are:

- hospitals merging and specialising at a rapid rate;
- patients who are more educated, grow older, have more chronic diseases and more co-morbidity, become less mobile, experience more frailty, and want the best care they can get around the corner;
- supportive information systems which have a tacit knowledge far superior to the individual clinical specialist;
- diagnostic systems (e.g. ECG, blood level sugar, clotting analysis, PO₂), which for a long time were exclusively available in hospitals.
- substitutions between professionals, between primary care versus informal care and between clinical specialist care versus primary care.
- the influence of the use of eHealth (and related subjects) on the needs of a healthcare professional.

The combination of all of these developments makes it more difficult to produce a reliable range of future needs for healthcare. The model still works; it is the assessing of the pace of changes that is the problem.

Concerning data themselves, the Netherlands did not report severe limitations and is not experiencing lack or misuse of data, models or methods. Despite good data availability, data on the

production of professionals are mostly unavailable on the individual level of professionals or the level of providers.

The unavailable data and the lack of exact data supplemented by estimates/sample-based data cause the most difficulties, leading to limitations in the quality of data, as sometimes data from limited surveys have to be used to obtain an estimate for entire populations of professionals or patients. The other significant challenge is the lack of clear definitions for key indicators. To handle the latter problem, a thesaurus has been started, which is maintained by NIVEL.

The lack of compatibility in the data source linking, the lack of quantitative data and the lack of triangulation of quantitative data with qualitative data mean a modest barrier. There are, however, positive experiences with data linking by Statistics Netherlands for all medical personnel.

Timeliness of data - mentioned already as a data collection process difficulty - can be classified also as a modest barrier, as registration has a lag time of two years due to legal and practical constraints.

Another modest weakness is that the relation between reported FTE and actual hours worked is not determined for most professions.

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Poland

History of HWF Planning

The first attempt to develop a model for the strategic planning of human resources in healthcare was initiated in the early 1990s by the Ministry of Health and led by Jagiellonian University, but this initiative was suspended in 1995. When planning for physicians and dentists in Poland, the supply side is considered. There is no dedicated planning organisation at any level, but there are national laws to govern planning. The objectives of planning the number of physicians, dentists and nurses are to adapt the supply to the variations of the demand and to guarantee a constant supply with the hypothesis of a constant demand. Poland also provides correct information in order to permit young people to choose their training pathway, and it increases the education level of the population without considering the demand for professionals. They monitor the changes in the number of specialists in a given medical field annually for doctors and dentists.

Currently Poland only uses HWF data for monitoring each sectoral profession. For nurses and midwives there are legally regulated tools for the healthcare entities to plan, count and measure the minimum number of nurses in said healthcare entities. National HWF Planning is considered in each profession. There is a lot of data and identified need, however, systematic steps have so far only taken place for health workforce monitoring. In the case of nurses and midwives there are new system solutions like ordering/commissioning nursing/midwifery competence (raising the number of students in nursing and promoting the profession) to be adapted in by 2020.

The establishment of the Health Care Professionals Training and Education Monitoring System (which entered into force on 1 December 2015) provides up-to-date individual data for every health professional on qualifications and professional activity. The data system is now being built, and introducing systematic HWF Planning would rely on detailed analysis. Various efforts have been made for having data on employment supported by clear legislation, however, IT solutions and incentives for healthcare providers are also necessary.

The main aspects of HWF Planning:

- 1) Reports: Consultants are cooperating in all 77 medical fields and nine dentistry fields both at the national and regional levels. Consultants provide opinions on specialisation education and professional training in reports to the MoH. The reports prepared by the national consultants for a given field contain the following information: situation in given field, challenges and proposal of solutions, feasibility of proposed solutions, what are the forecast health needs of the population in the upcoming three-year span, and how many and what sort of health workforce will be needed per 100,000 citizens of a given region. National consultants make their reports on the basis of reports prepared by regional consultants who in turn have access to all of the available data in a given region (medical/dental/nurses and midwives registers run by the respective regional chamber, data from CSIOZ containing information about the employment in the hospitals and medical/dental entities, Centrum Medyczne Kształcenia Podyplomowego, Centrum Medyczne Kształcenia Podyplomowego Pielęgniarek i Położnych, Centrum Egzaminów Medycznych, and GUS).
- 2) Limiting the number of students (medicine, dentistry): the MoH and MoEdu decide based on university capacity without endangering the quality of education.

3) Available places for specialist training are funded by the MoH. The specialisation training is either funded by the Ministry or a trainee can work under a contract agreed with the training facility. Taking into consideration the reports and data collected separately and directly from responsible authorities (Medical Center for Postgraduate Training, the Medical Examination Center, the Polish Chamber of Physicians and Dentists, the Health Care Information Center and the Central Statistical Office), the MoH decides on the numbers to be funded for specialist training places for each field.

4) Setting the priority field by means of regulations, if there are not enough specialists in the given field, or it is not popular among young physicians choosing their future specialisation field, or there is a need to support development in this field. Usually these are the ontological fields, anaesthesiology and family medicine. Higher salaries are provided as an incentive for MDs to choose the priority fields.

Trends in HWF

Although there are no reliable estimates on what the adequate HWF would be, available evidence suggests a shortage of healthcare professionals. The number of health professionals per 1,000 population was lower in Poland than in the EU15 on average for all key health professions and it has been decreasing since 2003, mostly because of outward migration. Inward mobility is insignificant. The migration of Polish healthcare professionals was already common even before EU accession, but HWF mobility showed a substantial increase after 2004. A reverse trend has been observed since 2007, with Polish medical physicians returning home. Emigration contributes to staffing shortages in certain medical specialties. Health policy on the issue is not well developed, and government activities are limited to general retention declarations. Some ad hoc policy interventions contributed to a reduction in migration, such as increasing the salaries of professionals (2006) or of resident medical physicians and dentists (2009) who particularly support the priority areas, or offering loans for starting independent practices (2001), increasing admission limits for health and health-related studies as well as residency places, and simplifying waiting times and the qualification processes for specialist training. Moreover, the managers of healthcare institutions offer changes in employment status, from full-time employment to fee-for service self-employment, allowing self-employed physicians to increase their working hours (beyond the limits of the EU Working Time Directive (2003/88/EC)) and thereby increase their income.

Data coverage, data types and data collection

Entities are obligated by the law to collect HRH data, however, data flow is not specified:

- Medical Center for Postgraduate Training (CMKP, Centrum Medyczne Kształcenia Podyplomowego), which runs the register of physicians and dentists that are currently undergoing specialist training;
- Medical Examination Center (Centrum Egzaminów Medycznych), which has data concerning medical exams and their outcome;
- The Polish Chamber of Physicians and Dentists (Naczelna Izba Lekarska), which runs the register of physicians and dentists;



- Health Care Information Center (CSIOZ, Centrum Systemów Informacyjnych Ochrony Zdrowia), which collects data concerning the medical profession;
- Central Statistical Office (Główny Urząd Statystyczny), which collects data concerning the situation in Poland;
- National Chamber of Nurses and Midwives (Naczelna Izba Pielęgniarek i Położnych) which runs the Central Register of Nurses and Midwives;
- Centre for Postgraduate Training of Nurses and Midwives (Centrum Medyczne Kształcenia Podyplomowego Pielęgniarek i Położnych) which collects data concerning postgraduate education and training of those professionals;
- Additionally, universities play an important role in data collection and provision as well.

For physicians and dentists, the number of specialists is planned from 1954, and entry limits at universities for medical faculties were introduced in 1986. There are “basic physicians” and “basic dentists” with a license to practise, plus 77 medical specialisations and family medicine for doctors, and nine specialisations for dentists.

There is a satisfactory amount of data regarding the number of health professionals (graduated and practicing) in the five sectoral professions. Following mobility precisely is challenging. For outflow there is the number of requests for a certificate of conformity from local governments, which means “intention to leave” data only, and for inflow there is nationality (double nationality is collected) from local governments, where the diploma was obtained. Poland has data for all five professions, but there are no reports available on mobility and inflows or outflows.

Gaps within MDS, HWF Planning data and process

- Coordination seems to be a challenge between the data providers, levels, individual responsible consultants and the many specialisation fields.
- HWF planning is not specifically addressed and named as the responsibility of any entity.
- Surprisingly the number of graduates and/or attrition is not tracked in the case of physicians and dentists.
- Data can only follow public employment.
- HWF mobility clearly influences HWF supply, but there is no specific method to include it into HWF Planning. Domestic HWF loss seems to be significant, especially in some specialisations. Recent interventions and some policy steps have obviously had a positive effect on HWF mobility (decreasing the outflow).
- There is a lack of uniformity in registers and definitions in Poland.
- Data is not collected routinely.
- Self-employed medical doctors are not subject to the same statistical registration as medical staff in the public sector.
- The number of certificates issued to work abroad indicates 'interest' rather than actual emigration.
- The number working abroad following EU accession is not known.
- Data on migration not recorded.

The main limitations are the presence of different data sources and the lack of accessibility to some data sources and indicators, furthermore, detailed data are not available. Having up-to-date data on employment is challenging and the information flow is not suitable. There are many actors with unclear roles in the process who might contribute to the creation of bias and duplication in data collections. In Poland a very important barrier was emphasised, and there were delays in setting up the HWF Planning system development due to bureaucratic difficulties and legislation. In addition, the most important issue is the lack of resources: human and financial.

Areas Category	Supply					Demand	
	Labour force	Training	Retirement	Migration - Inflow	Migration - Outflow	Population	Health consumption
Profession	Yes	Yes, partly	Yes	Yes	Yes		
Age	Yes	No	Yes	Yes	No	Yes	No
Head count	Yes	Yes	Yes	Yes	Yes	Yes	No
FTE	No						
Geographical area	Yes	Yes, partly	No	No	No	Yes, partly	No
Specialisation	Yes	Yes	No	Yes	Yes		
Country of first qualification	No	No	No	Yes	Yes		
Gender	Yes	Yes	Yes	Yes			

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Portugal

History of HWF Planning

Planning and regulation take place largely at the central level in the Ministry of Health and its institutions. Nowadays the General Direction of Health is responsible for the design, implementation and evaluation of the National Health Plan.

The Portuguese National Health Plan has been revised, extended to 2020 and commented on by WHO Europe. Collaboration on the National Health Plan (NHP) from 2012 to 2016 between Portugal and the WHO Regional Office for Europe has continued as part of the Biennial Collaborative Agreement (BCA) between the Government of Portugal and the WHO Regional Office for Europe. This work has built on the longstanding cooperation between WHO Europe and the Government of Portugal on national health policy development, implementation and evaluation, which included collaboration with the Regional Office on the previous National Health Plan 2004-2010.

The planning of the HWF in the National Health Service (SNS-Serviço Nacional de Saúde, NHS in English) is performed centrally by the Central Administration of the Health System (ACSS) and in close coordination with the Regional Health Administrations (ARS). ARS ensures the necessary coordination with hospitals and other healthcare units (local level). The HWF Planning environment with many stakeholders must be considered, and several ministries are included at the top level as well. It is essential to ensure the engagement of all stakeholders, including the private sector, to identify and clarify roles and responsibilities. The role of political will and commitment is essential, with ACSS being responsible for planning and providing proposals to the Government. It is the Government that approves and decides, however, for it establishes the priorities and ensures/allocates resources. A new law to support HWF data collection was recently approved: Law nº 104/2015, 24 August.

The management of the NHS takes place at the central level (ACSS) and at the regional level (five regions). *Numerous clausus* for the universities was introduced in 1977, which in conjunction with access to HP careers resulted in an insufficient number of nurses and doctors and the need to recruit from abroad. The issue was addressed by creating new medical schools and increasing intakes, thus the phenomenon has been reversed over the years, although currently the situation varies in relation to doctors and nurses.

For doctors there has been an increase in numbers in the system over the years, but there are still shortages for certain specialities, e.g. family medicine, anaesthesiology, radiology, urology, and others, and also problems in regional distribution, which also impacts negatively on the capacity to raise training capacity in accordance with the criteria applied by the Medical Society. Therefore, the Government has recently taken measures by creating incentives for the mobility of physicians and aiming to direct them towards less attractive areas.

With regards to nurses, the situation is derived from a number of factors, which are also related to the reinforcement of the role of nurses in the health system. Although there were important reductions over the last years, the situation is reversing.

Moreover, the retirement of many physicians in the last few years, with the greatest effect being felt in 2012-2014 may have contributed to the creation of some of the speciality shortages, as the *numerus clausus* policy applied in the past did not ensure a sufficient intake to replace them. There were several measurements aiming to improve the situation, including development of training and education, and incentives for recently retired physicians to come back to the NHS to overcome the shortage in physician supply. (HIT 2011) Although there is a shortage of GPs, there are limitations in terms of internship places, which depends on the capacity of national healthcare facilities to provide them with the right technical conditions for professional training recognised by the Medical Society (NHS primary care centres and hospitals).

Despite the existence of an active constraint on the number of doctor-training places, during the period 2004-2008 there was an increase of 49% in intern admissions and an increase of 42% in the number of interns in training programmes for GPs and family medicine, which shows the actions taken to address the limitations in primary care have made an impact. It is widely recognised that a shortage of GPs exists and that this situation is likely to be resolved in the near future, as a result of the increase in the entries in speciality training, in particular since 2011 (the increase was almost 50%).

Recent decisions by the Ministry of Health regarding training vacancies have helped to increase the yearly intake (Ministry of Health, Portugal, 2015).

According to the Portuguese medical internship data, between 2010 and 2015 the number of training vacancies increased 35.5%; for the same period intern admissions increased 37.2%.

In 2014, the public health sector had a total of 3,074 foreign professionals.

Trends in HWF

Main issues:

- Portugal and its health care suffered from the global economic and financial crisis due to its impact on health sector funding and thus supply of staff.
- According to the 1st draft- HEALTH AT A GLANCE 2015 - July 2015 - and ACSS analysis on that, the number of doctors per capita in OECD countries is 3.3 doctors per 1,000 inhabitants.
- Portugal is positioned in the 6th position in relation to the higher ratio (4.3 doctors per 1000 inhabitants), above the average of 34 OECD ratio (3.3). The document stresses that data from Portugal includes all authorized doctors to practice medicine, including those not exercising, which results in an overestimation of the number of physicians that provide care of about 30%.
- According to data from the Medical Society, in 2013 there were 45 927 registered doctors, who effectively correspond to a ratio of 4.3 doctors per 1.000 inhabitants. The NHS comprises 28.533 (jobs) physicians.
- The number of nurses has increased in both absolute and per capita terms. The document provides for Portugal a ratio of 6.1 nurses per 1.000 population, noting that this ratio has been closer to the OECD average. The same document for the year 2012, refers to Portugal with a ratio of 5.8 nurses per 1.000 population.

- In 2013 there were on average about 3 nurses per doctor in OECD countries. For Portugal the document refers to 1.4 nurses per doctor. MS recorded the same ratio. However, this ratio has a bias resulting from the overestimation of doctors practicing, as referred above.
- Midwives are not a separate professional group, there are nurses specialized in maternal health and obstetrics.
- There is HP unemployment and underemployment in parallel with shortages and maldistribution, in some professions.
- Imbalances between hospital care and primary care, between nurses and physicians, between geographical regions, and by specialty.
- Retirement of health care professionals.
- Most of NHS staff are employed as civil servants, but an increasing number of workers are under individual contracts because of different institution- status and types of personal hiring. All new posts at the NHS have had to be approved by the Ministry of Finance between 2011 and 2014.
- Multiple employment is characteristic. It is a question whether data can follow that. Portuguese legislation allows the existence of multiple employment and the new law approved last August (Law n° 104/2015, 24th August) allow a better understanding and characterization of this phenomenon.
- HWF mobility is to be considered. Portugal is a country which at the same time imports and exports health workers, in very low numbers, however.
- With the new Law n° 104/2015, 24th August - on the National Register of Health Professionals - the characterisation of the HWF situation will improve.

Data coverage, data types and data collection

In the MoH, including the NHS, the main data source is the central processing wage information system (known as RHV). Since 2013, ACSS has a set of strategic measures ongoing to improve and develop this system in order to use it as the main tool that can support the management of human resources in the health sector. There are several local data sources, some other database could be used and/ or developed to be used also for planning purposes. Linkage of RHV with other existing ones is under development.

The implementation of this process has been organized in 4 major steps:

- Migration of local databases (of each hospital) to a central database - concluded in 2013;
- Coverage of 100% NHS institutions and other institutions within the MoH and the new published law expected to allow full coverage in 2016, including all the HP in the country.
- Improve data quality - At the beginning, RHV was developed to meet the needs of the institutions (to process payroll) and not to satisfy data needs (e.g., for central planning), which resulted in very different sets of parameters for each institutions. It became clear that this paradigm had to be changed. The system was redesigned to meet the needs of the institutions as well to provide data for planning.

- A business intelligence system - being developed, that can provide reports regularly and more reliable data. This process is already under way (namely, with the identification and definition of indicators),
- The implementation of Law n° 104/2015, 24th August will require an informatics-system, which is already being developed.

Gaps within MDS, HWF Planning data and process

Portugal does not have a systematic HWF Planning system at present. But the country uses different methods/models of HWF Planning for different kinds of care, of health institutions, hospital networks, internship/professionals and activity, based on specific data bases and has made several steps to develop a comprehensive strategy on HWF information and management.

Over the last 4 years planning activities and coordination between ACSS and Health Regional Administrations has been strengthened.

Evaluation of current HWF Planning and aspects of systematic HWF Planning

Currently the system follows doctors, nurses and pharmacists for HWF Monitoring, and doctors and nurses for HWF Planning. Pharmacists in the NHS are predominantly employed by hospitals, with only a few in primary care. Apart from a few cases, there are currently no dentists employed by the NHS. In case of doctors, ACSS determines, together with medical society, the number of doctors who start training in different specialties and the number of vacancies to fulfil with new specialists coming out from internship annually. In case of nurses, ACSS has a system to calculate the needs of nurses and their work. There are recommendations for the allocation of nurses using indicators that consider the client's need and the health services to be provided - by - hospital services. And there is a pilot under course in five different places in the country testing the "family nurse" profile nurse.

Challenges with HWF Planning Data

The most significant limitations are, in some cases: lack/misuse of models/methods/data, no accessible data for the private sector, so far, and no data source linking, which Portugal is working in.

Quality of data, no clear definitions for key indicators, estimates, when needed, lack of triangulation of quantitative data with qualitative data, also pose challenges that are under development.

Law n° 104/2015, 24th August, helps to overcome these limitations.

Challenges in HWF Planning process

It is necessary to reinforce institutions involvement to overcome coordination difficulties. It is also challenging to deal with any sudden, unexpected shortages, despite regular analysis of data and estimations on base of the expected inputs and outputs. Legislation issues, problem with resources, sometimes no consideration of supply-demand-side also may occur. Regarding the level of planning

there is cooperation with the regions, and local institutions that also have some autonomy to contract personnel, thus planning at local level.

Nowadays, the difficulties mentioned above, in connection with the planning process, are currently being addressed and improved and we can say that coordination, information flows, European collaboration and involvement of partners are a reality.

Data from private sector and HWF mobility data are addressed in current measures in process.

Areas		Supply				Demand	
Category	Labour force	Training	Retirement	Migration - Inflow	Migration - Outflow	Population	Health consumption
Profession	Yes	Yes	Yes	Yes, partly	No		
Age	Yes	Yes	Yes	Yes, partly	No	Yes	Yes
Head count	Yes	Yes	Yes	Yes, partly	No	Yes	Yes
FTE	Yes						
Geographical area	Yes	Yes	Yes	Yes, partly	Yes	Yes	Yes
Specialisation	Yes	Yes	Yes	Yes, partly	Yes		
Country of first qualification	U.d.	Information only for MDs in training	U.d.	Yes, partly	No		
Gender	Yes						

Notes: The information provided refers to the time when the questionnaire was completed and part of it is now outdated.

Country of 1st qualification: the new law will make the collection of this information possible.

Migration, inflow: there is information on foreigners in the NHS and their entrance to the NHS or departure can be followed, with some changes, in the IS. Some professional organisations also have information on the inflow.

Migration, outflow: with the new law, professional associations should also provide available data on this subject. But individuals cannot be forced to provide information on it. Changes in the IS will have limited impact on these data.

Health consumption: data on the total costs of healthcare provisions in the public sector are available. There are survey data on the cost of inpatients by age.

Public versus private data: there has been a commitment and strategy to address and cover data from the private sector including HWF data. ACSS is responsible for setting up a database and processing the data, according to the referenced new law. Furthermore, professional associations and institutions must update their data every six months and report it to ACSS.

Differences between available data: HWF data collected by ACSS and data available from professional organisations are different but complementary for the planning process of the HWF.

Gaps

The country has a comprehensive strategy regarding HWF Planning, albeit there is no systematic and comprehensive HWF Planning with established methods and models. Several HWF Planning elements can be identified in Portugal, and implementation of its first steps has started.

The following steps are already in place:

- Annual inventory of approved health professionals (public, private and social sector)
- An integrated database on health professionals in the public sector (RHV)
- A dedicated health portal on health professionals (RNP)

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Slovakia

History of HWF Planning

Slovakia recognised problems associated with HWF and adopted a self-sufficiency policy in 2006. The health workforce policy in Slovakia is carried out at the national level. There is no workforce planning institution in the country, since health workforce issues belong to the Ministry of Health. The health workforce policy processes are partially influenced by founders, healthcare service providers and trade unions. The Ministry of Health cooperates with the Ministry of Education. Health workforce planning policy is determined by human resources and the wage policies of individual employers.

Slovakia does not have systematic health workforce planning and forecasting yet. It uses qualitative methods to estimate future numbers and collects a lot of data to see the shortages in different professions and the geographical coverage of the health workforce, however, the actions taken so far have not resulted in quantitative health workforce planning and forecasting models or calculations.

From the demand side, the empty statuses/jobs are known for each health profession. There is no designated national planning committee, and the Ministry of Health of the Slovak Republic is in

charge of health workforce issues. The National Health Information System is responsible for operating the Human Resource Monitoring system, which is under development.

The objective is health system sustainability, because there are significant outflows from the country. To ensure the appropriate number of health professionals, Slovakia took steps in order to have a systematic health workforce monitoring and planning system, which could support the policy and policy decision-making processes.

The first step of the health workforce planning activity was to establish a Human Resource Monitoring system, which contains up-to-date individual data for each health professional.

Trends in HWF

In Slovakia, the health workforce situation is similar to other Central-Eastern European countries. The number of health professionals decreased until 2006, and started to increase from 2007 as a result of introducing the EU Working Time Directive. The providers were forced to employ more employees in order to maintain operational levels.

The health workforce is ageing. The percentage of 50 years old or older physicians and dental doctors was 47.4% in 2007 (45.17% physicians and 61.81% dental doctors) and 46.95% in 2013 (45.21% physicians and 59.24% dental doctors).

Beyond ageing, Slovakia has significant inequality in the territorial distribution of health personnel. In addition, a large number of young health professionals are working abroad. Outflow mobility is also an issue in Slovakia. 500 medical doctor graduates and a similar volume of medical doctors leave the country annually, especially specialists.

1,404 medical doctors graduated in 2014 (563 of them were Slovak graduates and 841 were graduates from abroad).

There is no exact information on mobility. Nurses are also mobile, and a large number of nurses are leaving their jobs in Slovakia and working as caregivers in other EU Member States. According to estimations, more than 1,000 Slovak medical doctors work in the Czech Republic.

625 Slovak doctors who graduated from the Faculty of Medicine in Slovakia in the years 2004-2015 said in their request for a certificate of equivalence of education that they plan to go work in the Czech Republic. Because this information in the request was voluntary, we do not have information on whether they really left for the Czech Republic.

Data coverage, data types and data collection

Data on qualifications, licences, professional activity and requests for conformity certifications should all be covered. This process has several aspects, including legislation and IT solutions. Legislation is already in place and a data warehouse is currently being built. Conducting detailed analyses and introducing health workforce forecasting and planning are the next steps.

The latest process for data collection is that the National Health Information Centre initiated a national health administrative registry. A database for employment data (covering the public and private sectors) is being established, and while data provision for healthcare providers is compulsory, the quality of data highly depends on the provided information and how regularly it is updated. The data are available but to interconnect the registers takes a long time. This process has begun.

Gaps within MDS, HWF Planning data and process

The problematic points are in the ongoing process of data collection for HWF Planning, or in introducing HWF Planning methodology:

- There is no linking of the different data sources at a high level.
- The accessibility of some data sources is limited or is not possible.
- There are limited possibilities for obtaining information on mobility, as well as quality and compatibility (statistics and registry data) problems with the data.
- The process is fragmented, and there are still many actors in the process who might create duplications in the data collections.
- The limited use of potential data sources.
- Expertise is limited on the part of the responsible authorities.

Slovakia has not set up a workforce planning system because it has recently been summarising the knowledge and experiences necessary in the field of HWF monitoring and planning. A lot of authorities work in the field of data sources (different inputs, different outputs), and the interconnection of registers takes time. Legislation has been written, but time is needed to solve the technical problems.

Regarding the HWF Planning process, the three most significant limitations are:

- Lack of resources (e.g. financial, HR)
- No consideration of the supply and demand sides in HWF Planning (e.g. training, educational places not considered in the long term)
- Unclear roles of actors and shared responsibilities

Areas		Supply				Demand	
Category	Labour force	Training	Retirement	Migration - Inflow	Migration - Outflow	Population	Health consumption
Profession	Yes	Yes	Yes	No	No		
Age	Yes	No	No	No	No	Yes	Yes
Head count	Yes	Yes	Yes	No	No	Yes	Yes
FTE	No						
Geographical area	Yes	No	Yes	No	No	Yes	Yes
Specialisation	Yes	No	Yes	No	No		
Country of first qualification	Yes	No	Yes	No	No		
Gender	Yes						

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Spain

History of HWF Planning

To deal with health workforce problems at the strategic level, Spain established the health workforce planning system in 2006 in order to face these challenges. The objective of the planning system is to identify and locate the required number of intakes in Universities and also in specialisation schools. In other words, the goal is to ensure the appropriate specialties for the right place at the right time. To specify future skills or the professional mix is not the planning objective. The Spanish planning model focuses on specialist doctors. So far, Spain has not included other health professionals in its planning model. According to plans, the planning for nurses, dentists, pharmacists and midwives will start within the next three years. Planning for these professions is currently being established.

A supply and demand dynamic simulation is used to model for 43 medical specialties. The model calculates the supply and the deficit or surplus. The supply sub-model was implemented for each of the 43 specialties, and separately for women and men, since the flows that affect the stock of specialists, such as emigration and immigration, drop-outs, productivity, mortality, etc., differ significantly by gender. On the demand side, the model allows for the analysis of the degree of sensitivity of the parameters that are most uncertain: population growth, and the growth rate for the demand of each specialty. The model outputs provide for interaction between the supply sub-model and the demand sub-model.

The forecasting model looks at both the demand and the supply of the health workforce. The model includes demographic, education and labour market variables. Several scenarios were defined, which is the most important strength of the Spanish model. These scenarios show the potential different output of health workforce processes according to different inputs (demographic changes, education flows and labour market situation). Variables controllable by health planners can be set as parameters to simulate different scenarios. The model calculates the supply and the deficit or surplus.

The forecasting methods used are a combination of quantitative and qualitative methods. On the supply sub-model, the variables used are quantitative (numerous clausus, number of professionals by specialty, age group and gender, the number of training vacancies for each specialty, the mandatory retirement age, the equivalent full-time ratio, and the immigration rate by specialty). The demand sub-model uses quantitative variables (demographic estimations or normative standards for each specialty or group of specialties), but mainly qualitative variables (regional demands noticed by the regional health services, trends in demand defined through a non-structured interview of a panel of experts).



The qualitative method used is an ad hoc non-structured interview of a panel of experts (2009). The participants in this group of experts were:

- A subgroup of more than 20 experts from the Ministry of Health who work with HWF planning, the cataloguing of health services, health plans and health statistics.
- 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 experts was asked to weigh the trends in demand for every one of the medical specialties in the 2009-2025 period. The resulting outcome was the classification of the demand for medical specialties into the following categories:

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

In 2008, a survey of a Group of Experts took place, which focussed on the trends in demand for medical specialists until 2025.

Trends in HWF

The main challenge with respect to health workforce planning in Spain is that the country went from a surplus (in the 1980s) to a shortage of medical specialties (2003-2009). Shortages of professionals were in part solved through the inflow of professionals mainly from Latin America and Europe. According to the literature, Spain may face the similar immigration trends and social and policy problems and dilemmas as the UK.

Data coverage, data types and data collection

There is no unique database with data stored for planning purposes, but data used for planning are captured by the multiple sources available. A National Register of Health Professionals was created in 2012, and will be fully operative in 2016. Data used for planning are aggregated, and Spain plans to continue using aggregated data when the register becomes available.

The data used in the forecasting model comes from multiple data sources. In the absence of a registry, there are alternative data sources:

- Professional chambers register: providing information on registered professionals.
- Payroll data of the regional health services
- SNS Information System for Primary Care (SIAP)
- For hospital-based care, both ambulatory and inpatient, the source would be the National Survey of Inpatient Care Premises (SIAE)

In addition to the above-mentioned sources, the National Statistical Institute (INE) holds data on:



- Retired and active professionals by gender and age
- Health Professionals entering Spain: (a) Economically Active Population Survey (EAPS) (b) National Immigrant Survey (NIS) 2007 - the social and demographic characteristics of persons born abroad.

The Spanish planning system of specialists involves various stakeholders that enrich the discussions and bring different approaches: central, regional and professional. In a decentralised country like Spain, regional needs must be taken into account, but should not lose sight of the bigger picture/framework. National planning has to obey the greater needs, to promote cohesion and guarantee that patient care has the same quality and safety all over the country.

HWF Planning takes place at both the central level (the Ministry of Health, Social Services and Equality and the Ministry of Education, Culture and Sport) and the local level (Autonomous Communities). The Ministry of Health, Social Services and Equality coordinates and approves the number of specialised medical training posts. The Ministry of Education, Culture and Sport coordinates and approves the number of enrolments in medical degree courses. Autonomous Communities are involved as permanent members in the Human Resources Commission of the National Health Service, which is in charge of proposing the number of specialised medical training posts and in the Council University Policy.

Gaps within MDS, HWF Planning data and process

The Spanish planning model is based on more and more complex data than the MDS defined. But regarding the MDS data content, there are some difficulties. One of the most important limitations is the mobility data, which are not reliable in Spain: inflow mobility data are only of the number of recognitions, outflow data are only available via information requested from other countries or from published data. The other limitation compared to the MDS is that labour force data are available only for the public sector. The volume of the private sector is estimated by various sources. Moreover, demand side data are only considered for inclusion in the future and are currently not in the model.

Areas		Supply				Demand	
Category	Labour force*	Training**	Retirement***	Migration - Inflow	Migration - Outflow	Population	Health consumption****
Profession****	Yes	Yes	Yes	Yes	No		
Age	Yes	Yes	No	No	No	Yes	No
Head count	Yes	Yes	No	No	No	Yes	No
FTE	No						
Geographical area	Yes	Yes	No	No	No	Yes	No
Specialisation	Yes	Yes	Yes	Yes	No		
Country of first qualification	Yes	Yes	No	No	No		
Gender	Yes						

* Public sector. Private sector data are estimated through different sources (data by professional chambers, data by Statistics of Specialist Health Care Centers (SIAE)).

**Specialist training

***Retired health professionals

****Doctors, nurses and midwives. No data about pharmacists and dentists, except data on basic education.

The most important problem in Spanish health workforce planning and monitoring is the lack of comprehensive and appropriate data. The State Register of Health Professionals (REPS) will be established in 2016. REPS will collect and provide updated and reliable data for planning all health professions, including the private sector. Currently, data is unavailable on the private sector, and its involvement in the model is based only on estimation. After the establishment of REPS, monitoring will be improved, and REPS could provide the basics necessary for the forecasting and planning of all of the professions, not only for medical doctors.

The second problem is the involvement of stakeholders. Sometimes the Education Policymakers (central and regional) are not sensitive to the needs identified in HWF Planning, e.g. to maintain high numbers on the numerus clausus in the Medical Faculties, above identified needs. Stakeholder participation in Spain is very complex, and sometimes the stakeholders do not have sufficient training in planning to actively collaborate and improve the model. This is closely connected to the problems regarding the level of planning: the complications with regional and/or national levels, and the fact that the planning system is not structured.

Significant problems also exist with respect to organisational background and insufficient human and technical skills, capacity and financial sources to begin monitoring, forecasting and planning.

The following are the most important problems at the organisational level:

- Information flow failures: institutional involvement, coordination difficulties
- Low level of Stakeholder engagement: convincing decision makers faces difficulties
- Level of planning: a complicated regional and/or national planning system that is not structured
- Lack of resources (financial HR)

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Annex V. D043 Activity 3 Country Template

Country template for HWFP data gap analysis

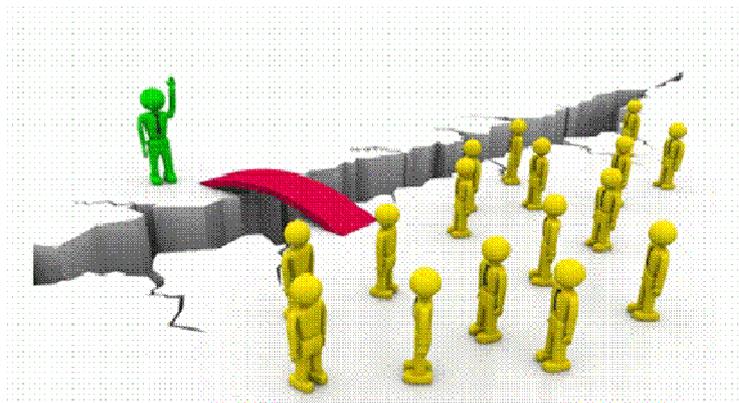
Work Package 4. Health Services Management Training Centre Semmelweis University, Hungary

Submission deadline: 15th March 2015

Please, consider the below questions in order to provide a quick overview about your **national Health Workforce Planning (HWFP)** - concerning both the **Process** (e.g., data collection, data reporting, data management, data flows) of HWFP and **Data** (e.g., data sources, datasets, methodology) available for HWFP.

Following up the latest changes, developments and completing the information of country profiles provided in the EC Feasibility Study (2012) and the country case studies in the JA deliverables D041-D042-D051-D052-D061, the present template aims to reveal and understand

- the systematic use of elements of HWFP (data and process-related),
- the current practical problems, critical points of national level HWFP,
- the feasibility, sustainability and availability of national HWFP.



In short: the aim of this WP4 work is to identify and collect actual difficulties for which we attempt to find solutions and recommendations through the gap analysis.

With this template, WP4 attempts to conduct an analysis on the **daily practice and scope of the application of HWFP data and elements of the HWFP process** in order to identify difficulties.

Further objectives of the WP4 Activity 3:

- to overcome these difficulties and
- to make HWFP structures and models work or
- to develop them to be more effective

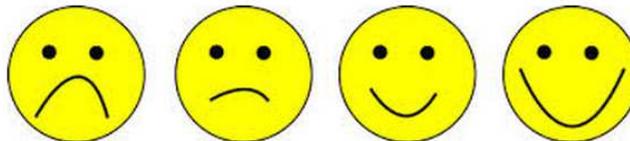
Country perceptions on stages of HWF monitoring, planning and forecasting

1. What professions do you currently follow from the 5 sectoral professions for purposes of HWF monitoring, planning and forecasting⁸⁵ in your country? Please, tick (✓) the appropriate cells in the table what applies to your country situation.

	Doctors	Dentists	Nurses	Midwives	Pharmacists ⁸⁶
HWF monitoring					
HWF forecasting					
HWF planning					
Please, provide the professional reasons why you do <u>not</u> conduct HWF planning					

2. How do you rate the feasibility of having/enhancing national HWFP to adapt the supply to the variations of demand in your country? Please, indicate your rating on a four point Likert-type scale

	Doctors	Dentists	Nurses	Midwives	Pharmacists
1 not feasible					
2 slightly feasible					
3 feasible					
4 highly feasible					
Please, provide comments on reasons why?					



⁸⁵ Forecasting = projections for the future

⁸⁶ Please also indicate if the country is planning for the pharmacies and not the pharmacists



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The process of systematic Health Workforce Planning

3a. If not having a systematic health workforce planning

What current/latest **initiatives and steps** are focusing on building/establishing HWFP in your country? What ongoing process and/or data collection is conducted or implemented in terms of HWFP? (Please, summarise in max. 100 words)

What **limitations do you experience** in general in your country in any ongoing process of data collection of HWFP, or in introducing HWFP methodology? Please, consider here the process perspective, the data collection and reporting aspect. (Please, summarise in max. 100 words)

What are the reasons why your country has not set up a workforce planning system (please, summarise in max. 100 words).



3b. *If the country has Systematic HWF planning:*

What **strengths/benefits**, and **limitations/barriers** do you see in HWFP process of your country? Please, consider here the HWFP process perspective, whether your country has e.g., explicit and clearly defined goals, integrity and flexibility of forecasting model, comprehensive data sets and methods, strong link between HWFP and policy actions, organization - involvement of stakeholders.

4. How **feasible, applicable, sustainable** is the current HWFP (e.g. data collection, data management) in your country in 2 out of the 5 sectoral professions - where you find HWFP the most relevant in your country? Please, consider any ongoing process or data collection of HWFP from solely professional perspective, not policy perspective.

	Doctors	Dentists	Nurses	Midwives	Pharmacists
Applicability					
Feasibility					
Sustainability					
Comments					

- Applicability = relevance, suitability, practicability of the current HWFP, appropriateness of data and methods
- Feasibility = usefulness, utility, probability, likelihood of something happening, being easily, conveniently done (good communication flow, accessible and available data sources, engaged stakeholders, commitment at national level)
- Sustainability = viable, capable of working successfully in a long time-run (IT aspect, longstanding traditions and support for ensuring the operation of data collection for HWFP)

Difficulties in the HWFP process

5. Please, **rate** the significance of the following difficulties/barriers/limitations/gaps that appear in your national HWFP **processes** (e.g. data collection, data management), how often your country faces them.

	1. never	2. few times	3. sometimes	4. often	5. regularly	Comments
a) No consideration of supply-demand side in HWFP (e.g. training, educational places not considered for long-term)						
b) No tracking of shortage or surplus of HWF (e.g. role of HWF mobility)						
c) Information flow failures - institutions involvement, coordination difficulties						
d) Low level of Stakeholder engagement - convincing decision makers faces difficulties						
e) Unclear roles of actors - shared responsibilities						
f) Lack of collaboration at EU/international level						
g) Level of planning - complicated regional and/or national, not structured planning system						
h) National legislation, regulation-related lacks or difficulties (mandatory vs. voluntary)						
i) Lack of resources (e.g. financial, HR)						

Note: Please insert additional rows for further significant limitations

5.2. What are the top three most significant limitations in your country from the list above?

1st _____

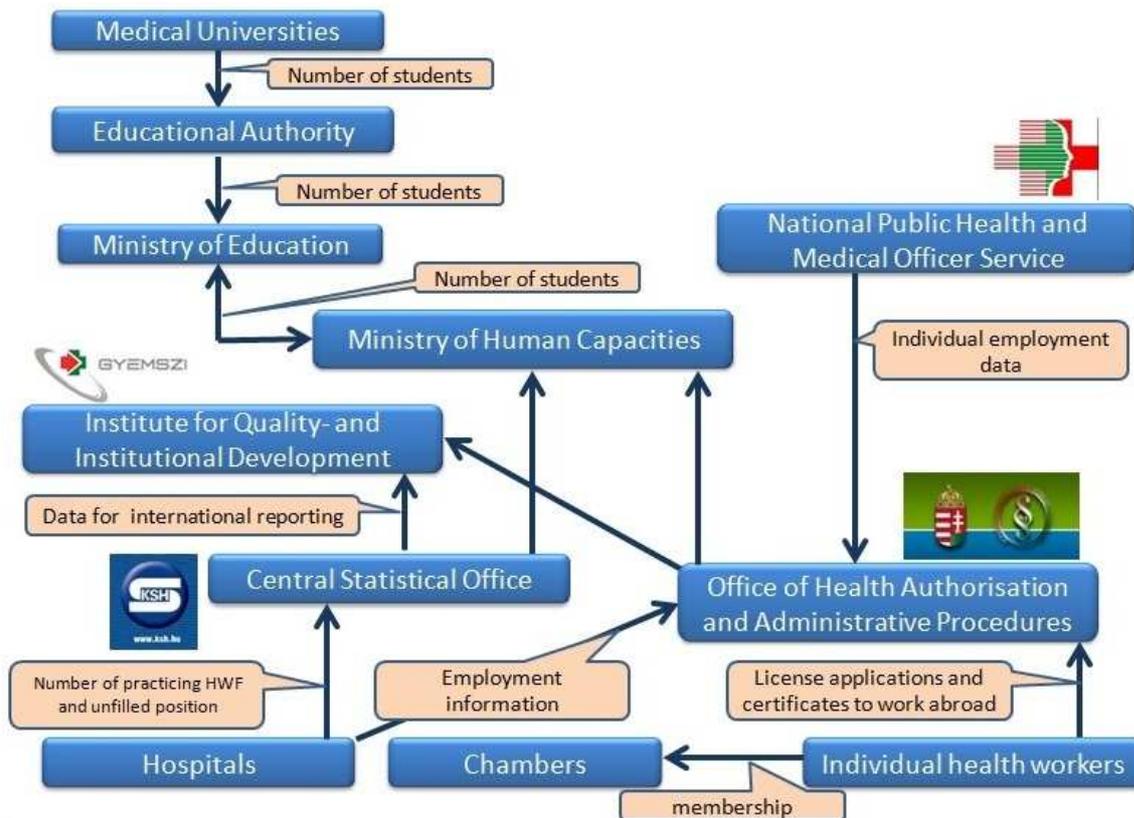
2nd _____

3rd _____

Please, provide max. 100 words comment on your ranking

Actors engaged in HWFP related processes

6. What actors play a role in the process? How is HWFP an organized and structured activity at national/regional level in your country? **Please, draw your country level chart that shows the flow of the most relevant HWF data needed for HWF planning.** The links between organisations should represent the flow of HWF data used for HWF planning. Please also indicate the contents of the data. (See as an example the Hungarian case)



Linking data sources

7a. *If no data linking:* Could any data sources be used for planning purposes in your country? Why do you experience **limitations in data source utilization**? How could data source linking be initiated and improved?

7b. *If yes:* What **positive/negative experiences** you have in data source integration, aggregation, linking? What preconditions are required to conduct data source linking in your opinion?

	Your experiences (max. 100 words)
Doctors	
Dentists	
Nurses	
Midwives	
Pharmacists	

Can you provide valid and reliable data for the following categories?⁸⁷

Areas	Supply					Demand	
	Labour force	Training	Retirement	Migration - Inflow	Migration - Outflow	Population	Health consumption
Category							
Profession							
Age							
Head count							
FTE							
Geographical area							
Specialisation							
Country of first qualification							
Gender							

⁸⁷ Only for Greece and Slovakia

Difficulties with HWFP Data

8. What are your practical problems, critical points regarding **data** in your country? Please, consider data gaps concerning frequently used data, availability and accessibility of crucial data and key indicators⁸⁸.

Please, **rate** the significance of the following difficulties/barriers/limitations that appear in HWFP **data**, how often your country faces them.

	1. never	2. few times	3. sometimes	4. often	5. regularly	Comments
a) Lack/Misuse of models/methods/data						
b) No up-to-date data (timeliness)						
c) Non-available data (e.g., FTE or Headcount)						
d) No accessible data (privacy)						
e) No good quality data (lack of valid, reliable data)						
f) No clear definitions for key indicators						
g) No clear categories (e.g. for specialisation)						
h) No data source linking						
i) No exact data but estimates/sample based data						
j) No use of qualitative data						
k) No complementation of quantitative data with qualitative data (lack of triangulation)						

Note: Please insert additional rows for further significant limitations

⁸⁸ particularly WP5 defined key indicators for the Minimum Data Set for HWFP: health production, health consumption, HWF mobility, overall coverage of HWF, cost aspects of the current HWF, imbalances of quality, unmet needs of domestic production



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8.2. What are the top three most significant limitations in your country from the list above?

1st _____
2nd _____
3rd _____

Please, provide max. 100 words comment on your ranking

Name and organization of respondents:

THANK YOU VERY MUCH FOR YOUR CONTRIBUTION!





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Glossary

Database: The terms database and data set are often used interchangeably. Database is a logical collection of values, its objects are relating to a single subject (OECD Glossary for statistical terms).

Dataset: Any organized collection of data, can be understood as a collection of similar data, sharing a structure, which covers a fixed period of time (OECD Glossary for statistical terms).

Health workforce monitoring: performing analysis on the current situation and aiming at responding to the challenges posed by the current situation (D052), data on the current and future health workforce are collected to monitor performance and forecast (EC Feasibility Study, 2012)

Health workforce planning: ensuring the right number and type of health human resources are available to deliver the right services to the right people at the right time (Birch et al. 2009).
Strategic planning: over the longer term direction of the health system, including resource allocation, system characteristics and ensuring a sustainable health workforce (EC Feasibility Study, 2012)

Health workforce forecasting: the required health workforce to meet future health service requirements and development of strategies to meet those requirements (D061)

Forecasting: descriptions and projections of possible and plausible future situations, estimate future needs for people and competences by reference to corporate and functional plans and forecasts of future activity levels; estimate the supply of people by reference to analyses of current resources and future availability, after allowing for wastage. The forecast will also take account of labour market trends relating to the availability of skills and to demographics (Amstrong, 2000)

Time horizon: The selection of the time horizon depends on the study subject and can range from just a few weeks to a lifelong time period. In any case, the entire time span, during which an impact of a study alternative on resource usage, effectiveness, outcomes, utilities, or quality of life can be expected or has been substantiated by previous research data, must be analysed (Schulenburg et al. 2008).



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