



HEROES

D7.1 Report on countries' data collection, HWF planning models and tools, planning skills improvement and stakeholders' involvement: Belgium, Czechia, Estonia, Germany, Malta, the Netherlands and Slovakia



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ABSTRACT

This report presents the consolidated findings of Work Package 7 (WP7) within the Joint Action HEROES, synthesizing country-level contributions from seven European countries: Belgium, Czechia, Estonia, Germany, Malta, the Netherlands, and Slovakia. Using the Sustainable Workforce Intelligence Planning System framework developed within the Joint Action HEROES, the analysis highlights achievements under the Joint Action and examines health workforce (HWF) planning capacity across four interdependent domains: political and contextual support, governance, planners' capabilities, and data and models. The comparative analysis reveals a clear maturity gradient, ranging from the long-established, legally mandated planning systems of the Netherlands and Belgium to the foundational governance efforts underway in Czechia, Malta, and Slovakia, with Germany and Estonia advancing ambitious new initiatives on health workforce planning. Three cross-cutting findings emerge: despite improvements under the Joint Action, data fragmentation persists universally, particularly on the demand side; governance arrangements, rather than data availability alone, decisively mediate the translation of evidence into policy; and stakeholder engagement is shifting from passive consultation toward active co-ownership. The report concludes that sustaining HEROES outcomes requires continued political commitment and investment at both national level and EU level, alignment with the European Health Data Space, and the prospective development of a European Health Workforce Dataspace to support resilient, evidence-based workforce planning across Europe.

STATEMENT OF ORIGINALITY

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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1. EXECUTIVE SUMMARY

This report presents achievements under the Joint Action and an analysis of HWF planning systems across seven countries: Belgium, Czechia, Estonia, Germany, Malta, the Netherlands, and Slovakia. The report is based on distinct country reports produced through the HEROES Joint Action. The analysis is structured around four domains of the Sustainable Workforce Intelligence Planning System framework: political and contextual support, HRH governance, HRH planners' capabilities, and HWF data and models.

Countries range from high-maturity systems with legally mandated planning bodies and advanced modelling to foundational stages where governance structures and planning tools are still being established. HEROES accelerated progress everywhere, with new forecasting models, national strategies, and institutional arrangements being developed during the project period.

Three cross-cutting findings emerge. First, governance, not data or technical capacity, is the primary determinant of whether evidence translates into policy action. Second, data fragmentation and weak demand-side modelling are universal challenges regardless of system maturity. Third, planning tool effectiveness depends as much on user capacity and institutional embedding as on methodological sophistication. The report concludes with domain-specific recommendations emphasizing the need for dedicated coordinating bodies, structured capability-building programs, data integration before new collection, and graduated model complexity aligned to institutional readiness.

2. INTRODUCTION

This report presents the consolidated outputs and cross-country comparative analysis of the WP7 Cluster within the Joint Action HEROES and constitutes the core analytical component of the country-level contributions developed throughout the project. The country reports compiled under WP7 provide a structured overview of national actions, governance arrangements and political support mechanisms aimed at ensuring the long-term sustainability of health workforce planning and policy reforms across the four domains of the Sustainable Workforce Intelligence Planning System framework.

WP7 Cluster brings together seven countries: Belgium, Czechia, Estonia, Germany, Malta, the Netherlands and Slovakia representing diverse health system models.

While differing in governance traditions and degrees of decentralization, these countries share key structural features: predominantly publicly funded systems with strong regulatory oversight, universal or near-universal coverage, and a central role for the state in defining workforce training capacity and employment conditions. Many of these systems also operate within multi-level governance frameworks, which adds complexity to coordination, data integration and long-term planning.

The guiding framework for this deliverable is the Sustainable Workforce Intelligence Planning System framework developed under WP4 and further detailed in Deliverable 1.2 - Final deliverable on HWF planning: data, models and skills. The framework organizes HWF planning capacity into four interdependent domains: (1) Political and contextual support, capturing governance arrangements, health system characteristics, and the institutional positioning of workforce planning; (2) HRH governance, examining coordinating bodies, stakeholder involvement, mandates, and planning processes; (3) HWF planners' capabilities, assessing the technical, analytical, and communication competencies available within planning institutions; and (4) HWF data and models, covering data sources, infrastructure, modelling approaches, and forecasting tools.

By aggregating and synthesising country-level inputs through cross-country comparative analysis, this report highlights common patterns, shared challenges and context-specific approaches adopted by participating countries to strengthen workforce planning across the four domains of the Sustainable Workforce Intelligence Planning System framework. It demonstrates how WP7 actions contribute to translating analytical capacity into decision-making, ensuring continuity beyond political cycles, and reinforcing the conditions for sustainable implementation of Joint Action HEROES outcomes at national level.

The report is structured as follows: (1) methodology overview; (2) cross-country comparative analysis; (3) conclusions and recommendations; and (4) distinct country reports.

3. METHODOLOGY

The comparative analysis (see below) draws on structured country-level reports produced by seven countries: Belgium, Czechia, Estonia, Germany, Malta, the Netherlands, and Slovakia. All reports were prepared using a common analytical framework established in D1.2: Sustainable Workforce Intelligence Planning System framework, which provided both the conceptual basis for the comparative analysis and the standardized structure for the country reports themselves. The framework organizes HWF planning capacity into four interdependent domains: (1) Political and contextual support, capturing governance arrangements, health system characteristics, and the institutional positioning of workforce planning; (2) HRH governance, examining coordinating bodies, stakeholder involvement, mandates, and planning processes; (3) HWF planners' capabilities, assessing the technical, analytical, and communication competencies available within planning institutions; and (4) HWF data and models, covering data sources, infrastructure, modelling approaches, and forecasting tools.

Data collection was conducted by synthesizing the country reports domain by domain as all the country reports followed a similar document template. Within each domain, common patterns were identified across countries, differences in organizational models and institutional arrangements were examined, and countries were positioned along a maturity gradient ranging from foundational to high-maturity systems. This approach prioritized thematic synthesis over country-by-country description, enabling the identification of cross-cutting challenges, emerging trends, and transferable lessons. Maturity levels were assigned based on the presence or absence of key institutional features: legal mandates, dedicated planning bodies, recurring planning cycles, data integration, and operational forecasting models.

Several methodological limitations should be acknowledged. The country reports vary in depth, scope, and emphasis, reflecting differences in national reporting traditions and available documentation rather than a standardized data collection instrument. The heterogeneity of health systems, governance structures, and planning maturity means that direct comparability across countries is inherently constrained. Maturity classifications are necessarily qualitative and based on the evidence presented in the reports rather than on externally validated assessment criteria. Furthermore, the analysis captures a snapshot of systems at the conclusion of HEROES and may not fully reflect ongoing reforms or developments initiated after the reporting period.

To strengthen the analytical transparency of this synthesis, the maturity gradient was operationalized along four observable criteria drawn from the country reports themselves: (i) the existence of a legally or formally mandated planning body; (ii) the regularity and structure of the planning cycle; (iii) the degree of supply- and demand-side data integration; and (iv) the operational status of forecasting models linked to policy decisions. Countries were positioned within four tiers: foundational, developing, emerging, and high-maturity, reflecting how many of these criteria were met at the conclusion of HEROES. To mitigate the comparability constraints inherent in heterogeneous reporting, two steps were taken: country reports were aligned ex post against the four common WP4 framework domains and ambiguous evidence was triangulated against project deliverables and policy dialogue outputs.

4. COMPARATIVE ANALYSIS

This section synthesizes the findings from country reports across seven participating countries: Belgium, Czechia, Estonia, Germany, Malta, Netherlands and Slovakia. The analysis was prepared using a common analytical framework established in D1.2: Sustainable Workforce Intelligence Planning System framework, which provided the conceptual basis for the comparative analysis.

What most clearly differentiates the high-maturity systems from the foundational ones is not the volume or quality of available data, but the institutional decisions taken decades earlier to embed HWF planning in legally mandated bodies. These long-standing structures have produced recurring planning cycles, stable stakeholder chambers, and analytical teams whose continuity is independent of individual projects. By contrast, less mature systems are characterized less by data scarcity than by the absence of a coordinating body with a clear mandate to convert that data into binding policy advice. Governance history and the legal anchoring of planning responsibility therefore emerge as the principal explanatory factors behind the maturity gradient, with data infrastructure and analytical capacity acting as supporting rather than determining conditions

Domain 1: Political and Contextual Support

Summary: All seven countries demonstrate that HWF planning is deeply shaped by national governance structures, financing models, and the degree of decentralization. While political commitment to HWF planning has grown across the board, the translation of strategic intent into sustained institutional action varies considerably. Countries with longer planning traditions and dedicated advisory bodies are better positioned, but even they face challenges in aligning multi-level governance with coherent workforce strategies. The achievements of Joint Action HEROES provide a strong foundation for the continued strengthening of HWF planning systems across Europe and for the development of more resilient, sustainable, and evidence-informed health systems.

The seven countries represent a wide spectrum of healthcare governance arrangements, yet they share a common recognition that HWF planning requires dedicated political and institutional support to move beyond ad hoc responses toward strategic, evidence-based action. The HEROES Joint Action served as a catalyst for strengthening this recognition, though countries entered the initiative at markedly different stages of maturity.

At the most advanced end of the spectrum, the Netherlands and Belgium operate long-established, institutionally embedded planning systems. The Netherlands' Advisory Committee on Health Workforce Planning (ACHWP), active since 1999, represents a mature governance arrangement in which periodic national advice on training inflow is produced through a structured process combining quantitative modelling, stakeholder consultation, and ministerial decision-making. Belgium's Federal Planning Commission, established in 1996, similarly provides a formalized mechanism for HWF advice, though its federal political structure adds layers of coordination complexity. Both countries benefited from HEROES primarily through refinement rather than foundational development, using the initiative to advance demand modelling, scenario analysis, and cross-sector policy dialogues.

In Germany, the Federal Joint Committee provides a nationwide uniform planning system for physicians with its needs planning guideline. Although the country possesses extensive HWF data, it lacked an integrated federal-level monitoring and forecasting model prior to HEROES. The feasibility study commissioned during the HEROES initiative led to the piloting of a comprehensive HWF monitoring model, covering 54 occupational groups.

Estonia, Slovakia, Czechia, and Malta entered HEROES at earlier stages of planning maturity, albeit with different starting points. Estonia moved rapidly from a fragmented baseline to developing three distinct forecasting models and establishing a new HRH team within the Ministry of Social Affairs, demonstrating that targeted investment in analytical capacity can yield substantial progress within a short timeframe. Slovakia similarly advanced from static minimum staffing norms to developing dynamic replacement and expansion demand models, while also drafting a National Strategy for Healthcare Workforce Planning set for governmental endorsement. Malta, starting from a largely reactive and vacancy-driven approach, used HEROES to embed HWF planning as a strategic function within the Ministry for Health and Active Ageing, supported by the adoption of a Nivel-developed planning tool and structured policy dialogues.

Czechia represents a distinct case where the core challenge was institutional rather than technical. Despite possessing a relatively robust data infrastructure through its National Health Information System, Czechia lacked a coordinating governance structure and dedicated planning entity. HEROES helped open the topic at ministerial level and facilitated the design of a proposed planning process, but formalization and implementation remain pending.

A common pattern across all seven countries is the influence of demographic ageing, rising chronic disease prevalence, and evolving expectations regarding work-life balance on HWF demand. Decentralization, whether federal (Belgium, Germany), regional (Czechia, Slovakia), or sector-based (the Netherlands) consistently creates coordination challenges, requiring mechanisms to reconcile national strategic direction with local service delivery realities. Countries that have invested in cross-level dialogue, such as Belgium's inter-ministerial conferences and the Netherlands' stakeholder chambers, appear better equipped to navigate this complexity, whereas countries with more fragmented governance arrangements continue to struggle with translating evidence into coherent policy.

Domain 2: HRH Governance

Summary: HRH governance arrangements vary substantially, from highly institutionalized multi-stakeholder systems to fragmented structures with no dedicated planning body. The main policy implication is that governance maturity, defined by clear mandates, designated coordinating bodies, and structured stakeholder involvement is the single most important determinant of whether HWF data and tools translate into effective policy action. Countries without dedicated governance structures risk that even high-quality data remains unused.

The HRH governance across the seven countries reveals a clear maturity gradient, ranging from highly institutionalized systems with legal mandates and dedicated advisory bodies to arrangements where HWF planning responsibilities remain diffuse, informal, and distributed across multiple institutions without coordination.

The Netherlands and Belgium represent the most mature governance configurations. The Dutch ACHWP functions as an independent advisory body with a clear mandate to advise the Ministry of Health on training inflows for approximately 80 health professions, supported by profession-specific chambers that ensure structured stakeholder participation. The process integrates quantitative modelling, qualitative expert sessions, and ministerial decision-making within a recurring three-year cycle. Belgium's system operates through multiple Planning Commissions at Federal and Community levels, with legally defined stakeholder involvement and dedicated technical support from the HWF Planning Unit. Belgium's stakeholder matrix is notably extensive, encompassing over 70 organizations across governmental agencies, educational institutions, professional orders, research institutes, and social insurance bodies. The breadth of formal stakeholder engagement reflects the country's consensus-driven governance culture, though it also introduces coordination costs and the risk of slow decision-making.

Germany's governance reflects the complexities of its corporatist and federal system. While the Federal Ministry of Health holds primary responsibility for health policy, the self-governing bodies hold considerable data and regulatory authority. Following the piloting of the HWF monitoring model, other entities of the stakeholder matrix may be gradually involved.

Estonia took a decisive step during HEROES by establishing an HRH team within the Ministry of Social Affairs, headed by a newly created HWF Policy Lead position. Though not operating as a fully distinct unit, this team has assumed coordination responsibility for all HWF planning activities. The establishment of formal committees for setting training quotas, combined with the new forecasting models, provides Estonia with a nascent but functional governance framework. A key strength is the clear allocation of central coordinating responsibility to the Ministry, though the small team size raises questions about long-term sustainability and resilience.

Slovakia and Malta have made significant governance progress during HEROES, but from very different starting points. Slovakia's governance is centralized within the Ministry of Health and the Institute of Healthcare Analyses, which jointly developed the planning model and drafted the National Strategy. However, the absence of a dedicated organizational unit for HWF planning has been identified as a structural weakness. Malta embedded operational responsibility within the People Management Division of the Ministry for Health and Active Ageing, and HEROES supported the transition from a siloed HR function toward a cross-sectoral planning responsibility. The planned formalization of HWF planning within the Division Director's role signals institutional commitment to sustainability.

Czechia's governance remains the most fragmented among the seven countries. Despite identifying 32 stakeholders grouped into seven clusters, no institution currently holds formal coordinating responsibility for HWF planning. HEROES facilitated the design of a proposed institutional model comprising data, analytical, and executive units, but its implementation requires political endorsement. The Czech experience underscores that governance is not merely an administrative question but a political one.

In terms of maturity levels, the countries can be broadly categorized as follows. The Netherlands and Belgium represent a high-maturity tier, characterized by legally mandated planning bodies, recurring planning cycles, and broad stakeholder integration. Germany and Estonia occupy an emerging-maturity tier, having established significant monitoring and forecasting infrastructure during HEROES but still needing to expand stakeholder involvement. Slovakia and Malta form a developing maturity tier, where foundational governance structures and planning tools have been created but require institutionalization and sustained political commitment. Czechia sits at a foundational stage, where the main achievement has been the articulation of a governance vision and the initiation of stakeholder dialogue, with implementation occurring in the future.

Domain 3: HWF Planners' Capabilities

Summary

Building planner capabilities proved essential across all countries, yet approaches ranged from comprehensive training programs to informal knowledge transfer. A recurring finding is that technical modelling skills alone are insufficient, planners also require strategic thinking, data governance expertise, stakeholder engagement abilities, and the capacity to translate analytical outputs into policy-relevant advice. The key policy implication is that sustained investment in human capital for HWF planning is essential to avoid dependency on individual experts and ensure institutional resilience.

The capacity of workforce planners represents a critical but often underappreciated dimension of sustainable HWF planning systems. The HEROES experience across seven countries reveals that while technical skills in data analysis and modelling are necessary, they are far from sufficient. Effective HWF planning demands a composite skill set that spans strategic thinking, data governance, inter-institutional collaboration, policy translation, and stakeholder communication. The distribution of these capabilities varies markedly across the countries examined, and the approaches to capacity building during HEROES ranged from formal training programs to learning-by-doing within project teams.

Belgium and the Netherlands, with their established planning institutions, entered HEROES with well-developed planners' capabilities. Belgium's Planning Commissions and supporting technical units already possessed strong data analytics, modelling, and stakeholder engagement skills. HEROES reinforced these through a targeted capacity-building program in 2025, comprising three in-person training sessions attended by 20–30 participants each, drawn from planning commissions at both Federal and Community levels. These sessions focused on deepening understanding of the existing planning model, demand-side measurement, and the integration of epidemiological and career data. The Belgian experience highlights that even mature systems benefit from regular skill renewal, particularly as the analytical demands of HWF planning evolve toward more complex areas such as multi-professional modelling, skill-mix analysis, and the incorporation of technological change. In the Netherlands, planner capabilities were similarly advanced, with HEROES initiating steps toward structured training for workforce planners at NIVEL and the ACHWP, focusing on core competencies, stakeholder collaboration, and technical model development.

Estonia adopted a pragmatic, capability-by-doing approach. The Ministry of Social Affairs hired an external expert in late 2024 who produced the three forecasting models over a twelve-month period. The team identified that successful model use requires different skill profiles depending on the level of engagement: back-end users need strategic thinking, advanced Excel skills, data analytics, and the ability to integrate data across sources, while front-end users require a narrower set of competencies focused on data input, output interpretation, and contextual understanding. A structured six-month handover process was initiated in early 2026 to transfer knowledge to a designated person within the Ministry of Social Affairs Analysis Department. The team organized three practical training sessions for front-end users in January and February 2026. Estonia's experience underscores that model usability is closely linked to the data literacy of end-users and that developing tools accessible to non-specialists requires deliberate design choices.

Slovakia developed capabilities through a partnership with the external contractor Trexima, with two analysts from the Institute of Healthcare Analyses participating in six dedicated training sessions covering all model modules. The training followed an iterative approach, beginning with online conceptual sessions and progressing to in-person practical testing and handover. Slovakia is also developing comprehensive methodological documentation to ensure institutional memory and enable future analysts to operate the model independently. This documentation-centered approach reflects a conscious strategy to mitigate the risks of staff turnover, a challenge that all countries identified as a significant threat to planning sustainability.

Germany's capacity building focused on the institutional level, with the Federal Institute for Vocational Education and Training (BIBB) conducting the HWF monitoring project. The scientific advisory board plays a role in validating methodological approaches and ensuring that outputs are policy relevant.

Malta and Czechia represent countries where capability development was among the most transformative outcomes of HEROES. Malta invested in training through information seminars, hands-on workshops on the NIVEL planning tool, and plans for additional training in change management and health economics. Czechia hosted its first national training session on HWF planning in October 2025, representing an important inaugural step. Both countries noted that building analytical capacity requires not just training events but sustained institutional embedding, mentoring, and opportunities for practical application.

A cross-cutting challenge identified by virtually all countries is the tension between the complexity of planning models and the usability requirements of diverse end-user groups. Estonia's decision to create three separate models rather than one comprehensive tool, and the Netherlands' shift from technical complexity toward accessibility and usefulness, both illustrate a growing recognition that the effectiveness of planning tools depends as much on user capacity as on methodological sophistication.

Across the seven countries, the link between planner capacity and policy effectiveness is mediated above all by institutional resilience. Where capabilities reside in small expert teams, staff turnover poses a direct threat to continuity of advice. The cross-country pattern suggests that capacity-building in HWF planning yields policy effects only when paired with documentation, redundancy, and institutional embedding, technical training alone does not protect planning systems from the loss of their key individuals.

Domain 4: HWF Data and Models

Summary: Data fragmentation, heterogeneous classifications, and demand-side gaps are universal challenges, though countries differ markedly in how advanced their data infrastructure and modelling approaches are. A critical policy implication is that data quality and integration are prerequisites for meaningful forecasting, and that modelling sophistication should be calibrated to the governance and institutional capacity available to use model outputs. Simple models embedded in strong governance arrangements may produce more policy impact than sophisticated models operating in weak institutional settings.

The data and modelling dimension of HWF planning is where the greatest variation in maturity across the seven countries becomes most visible. All countries face challenges related to data fragmentation, inconsistent classifications, limited demand-side data, and difficulties in linking supply and demand information. However, the sophistication of their responses ranging from established national planning models to nascent data mapping exercises varies enormously.

The Netherlands possesses the most developed modelling infrastructure. Its stock-and-flow model, developed over decades by NIVEL and the ACHWP, projects supply and demand for all professions whose training is funded by the Ministry of Health, including all physician specializations, advanced practice nurses, specialized nurses, physician assistants, and health psychologists. The model combines quantitative demographic projections with structured qualitative expert sessions to capture non-demographic factors such as technological innovation, skill-mix changes, and care reorganization. During HEROES, the model was refined to include multiple policy levels beyond training volumes, with redesigned outputs enabling policymakers to compare alternative policy pathways. The Netherlands also introduced improvements in how qualitative data is collected, shifting from seven separate trend estimations to a single combined effect estimate to reduce overestimation. Despite this maturity, the Dutch system acknowledges persistent challenges: most data are available only at aggregate level due to privacy regulations, regional labor market differentiation is not structurally incorporated, and estimating unmet demand remains difficult.

Belgium's planning model draws on an extensive data ecosystem that integrates the Federal Database of Health Care Professionals, RIZIV/INAMI reimbursement data, labor market statistics, and educational data. The system already enabled planning for multiple professions, and HEROES supported further improvements including the introduction of the Practice Registry for dentists, enhanced data linkage, and stakeholder consultation to refine scenario modelling. Belgium's transition from headcount-based planning toward full-time equivalent (FTE, unit of measurement that converts the hours worked by part-time or variable-hour employees into the equivalent of a full-time worker) measurement and activity-based data represents a significant qualitative shift, though data fragmentation across linguistic communities and governance levels remains a persistent constraint.

Germany's HWF monitoring represents perhaps the most ambitious new modelling initiative among the seven countries, covering 54 occupational groups with projections to 2040 across headcount, FTE, and three institutional settings. The model builds on the established QuBe projection methodology and incorporates occupational mobility, working time preferences, and demographic-driven demand. The data harmonization required was substantial, given the heterogeneity of sources across federal statistical offices, professional associations, insurance bodies, and labour market agencies. The first baseline projection was completed in 2025, with regionalization planned for 2027. Germany's approach illustrates both the potential and the challenge of building a comprehensive monitoring system in a data-rich but institutionally fragmented environment.

Estonia developed three purpose-built Excel-based models: a primary healthcare workforce model covering seven professions and approximately 5,000 professionals, an emergency medical services model covering four professional groups and approximately 1,700 professionals, and a training intake model encompassing 77 professions and roughly 21,000 professionals. The decision to develop separate models rather than a unified tool was driven by the need for usability, reflecting different functional requirements and user groups. Supply data quality was found to be generally high, though demand-side data presented challenges. Estonia's models include scenario planning capabilities and allow projections up to 25 years.

Slovakia built a comprehensive modelling framework implemented in Python, consisting of 13 interconnected modules covering supply consolidation, current mismatch identification, demographic projections, hospitalization forecasting, expansion and replacement demand estimation, and graduate inflow projections. The model links NCZI workforce data with ISCP employment data, enabling cross-validation and improved accuracy. A distinctive feature is the separate treatment of inpatient and outpatient demand, with dynamic forecasting of hospitalization rates and lengths of stay. The model's outputs are already informing the National Strategy for Healthcare Workforce Planning, demonstrating that even newly developed tools can achieve policy relevance when embedded within governance processes.

Malta adopted the NIVEL-developed stock-and-flow planning tool, initially piloted for a single profession in 2022 and subsequently expanded to general practitioners, emergency department physicians, and allied health professionals. The model supports competency-driven planning rather than simple headcount projection and has facilitated qualitative policy discussions on task shifting and role redesign.

Czechia remains at the earliest stage, with data infrastructure that is relatively robust but underutilized due to the absence of systematic analysis, data linkage, and planning tools. The launch of the Administration System for Healthcare Education in 2026 represents a positive step toward improved data validation and inflow tracking.

Across all countries, common data challenges include the difficulty of measuring actual working time and FTE accurately, limited visibility on workforce mobility and career interruptions, insufficient demand-side modelling (particularly regarding epidemiological drivers and unmet need), and privacy-related constraints on individual-level data linkage. The HEROES experience suggests that countries at earlier maturity levels should prioritize data integration and governance over model complexity, while more advanced countries should focus on incorporating qualitative scenario inputs, regional differentiation, and multi-professional planning to enhance the strategic value of their planning tools.

The path from data inputs to policy decisions is most clearly observable in those countries, where model outputs feed directly into a named policy instrument creating a documented chain from registry data, through projection modules, to ministerial decisions on quotas and recruitment grants. The trade-off between model complexity and usability emerged as a central lesson of HEROES: even simple tools using only a few key variables can provide meaningful policy insights, and the effectiveness of any model depends more on its governance positioning than on its technical sophistication. Simpler models embedded in clear governance routines therefore tend to outperform sophisticated tools operating without an institutional pathway to decision-making. This finding is particularly relevant for countries at earlier maturity stages, for which graduated complexity aligned to user capacity is likely to deliver more policy traction than premature methodological ambition.

5. CONCLUSIONS & RECOMMENDATIONS

Main Findings

This comparative analysis of seven WP7 countries confirms that HWF planning is universally recognized as a strategic necessity, yet the capacity to act on this recognition varies substantially. The HEROES Joint Action accelerated progress everywhere, but countries entered and exited the initiative at markedly different maturity levels from the long-established, legally mandated systems of the Netherlands and Belgium, through the ambitious new monitoring initiatives of Germany and Estonia, to the foundational governance and data-mapping efforts of Czechia, Malta, and Slovakia.

Three common features stand out. First, all countries struggle with data fragmentation: supply data is scattered across registries, professional bodies, and labour market institutions, while demand-side data, particularly on epidemiological drivers and unmet need, remains underdeveloped everywhere. Second, governance is the decisive mediator between data availability and policy impact; countries with dedicated coordinating bodies and clear mandates consistently translate evidence into action more effectively than those where responsibilities are dispersed. Third, stakeholder engagement has shifted from passive consultation toward active co-ownership of planning processes, a trend visible across all maturity levels.

Key systemic challenges persist. Measuring actual working time and FTE remains technically difficult, limiting the accuracy of supply projections. Regional differentiation is acknowledged as essential but is structurally incorporated in very few countries. Staff turnover within planning units threatens institutional memory and model continuity, particularly where knowledge is concentrated in small teams. Finally, an emerging trend across the more mature systems is the recognition that model sophistication must be balanced against usability: planning tools are only effective if their intended users can operate and interpret them. The shift from purely technical model development toward governance-embedded, user-centered planning represents the most significant conceptual evolution observed during HEROES.

Recommendations

Political and contextual support: Countries without a formal national HWF strategy should prioritize its development and secure governmental endorsement, as demonstrated by Slovakia and Malta. Where strategies exist, they should include explicit HWF planning mandates with measurable targets and accountability mechanisms. Cross-sectoral coordination between health, education, and labour ministries should be institutionalized through standing inter-ministerial mechanisms rather than relying on ad hoc project-based cooperation.

HRH governance: Each country should designate a single coordinating body with a clear legal or administrative mandate for HWF planning, as the analysis shows that dispersed responsibility is the primary barrier to translating data into policy. Countries at earlier maturity stages – notably Czechia – should establish a dedicated planning unit comprising data, analytical, and policy functions. More advanced systems should formalize the involvement of stakeholders who remain outside current governance structures, particularly employer associations and regional authorities, as identified in the German and Belgian stakeholder matrices.

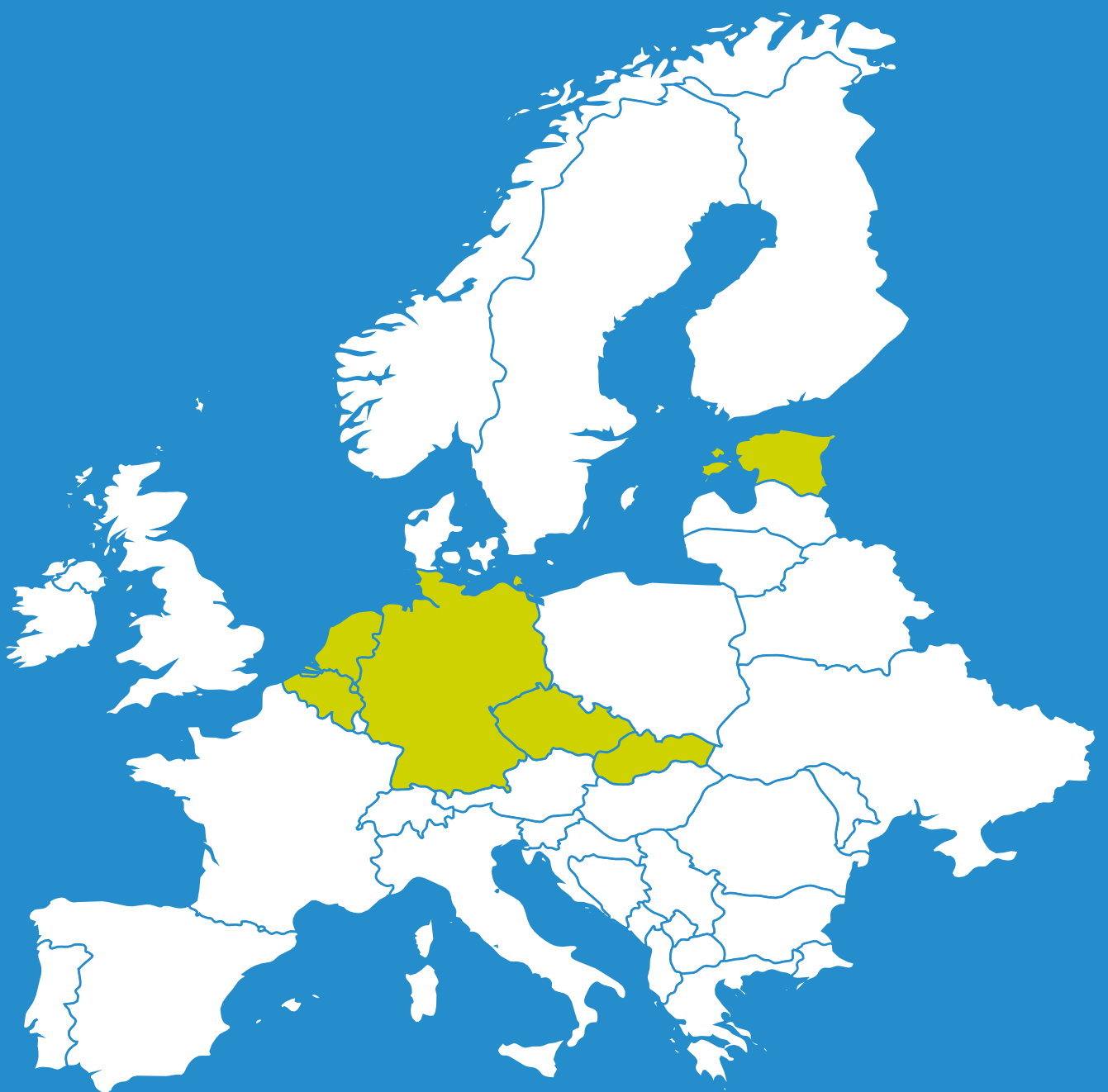
HWF planners' capabilities: All countries should develop structured handover and documentation protocols to protect against knowledge loss from staff turnover, following the approaches piloted in Estonia and Slovakia. Training programs should differentiate between back-end model operators and front-end policy users, calibrating content to each group's required competencies. Ongoing professional development in data governance, scenario analysis, and policy translation should be embedded as a recurrent institutional function rather than treated as a one-off project activity.

HWF data and models: Countries should prioritize linking existing supply-side registries before investing in new data collection, as cross-validation between sources yields immediate quality gains. Demand-side modelling should be strengthened by integrating epidemiological projections and service utilization data alongside demographic drivers. Model design should follow a principle of graduated complexity: countries at earlier stages should begin with robust stock-and-flow models embedded in strong governance, while advanced systems should invest in regional differentiation, multi-professional planning, and structured qualitative scenario inputs.

Future-Proofing the results

The work undertaken within the cluster clearly shows that Member States have achieved considerable progress since the first Joint Action, particularly in translating technical results into policy-relevant outcomes and sustainable cooperation mechanisms. The experience of WP7 countries demonstrates the importance of consolidating results into long-term strategies, platforms for collaboration, and structured stakeholder engagement, ensuring that health workforce planning effectively informs policy decision-making. In this regard, HEROES has marked a crucial step forward by reinforcing sustainability, fostering a community of practice, and promoting the long-term uptake of tools, methodologies, and policy frameworks across Europe with clearly demonstrated progress in each participating country. However, maintaining and expanding this impact requires continued support through strong commitment at national level, including future EU-funded actions. Sustained investment would ensure that the progress achieved is not only preserved but further scaled, strengthening governance and coordination across countries. It would also allow working together on more innovative approaches, through for example the use of AI to support health workforce planning. Looking ahead, aligning future initiatives with the European Health Data Space (EHDS) would provide a strategic opportunity to enhance data integration and policy coherence. The creation of a "European Health Workforce Dataspace" would represent a transformative development, supporting evidence-based decision-making and ensuring a more resilient, sustainable, and future-oriented health workforce across the European Union.

6. COUNTRY REPORTS



COUNTRY REPORT

BELGIUM



6.1 COUNTRY REPORT: BELGIUM

Introduction

National HWF Planning System before HEROES

The Belgian health system covers almost the entire population for a wide range of services and is mainly financed by social contributions, proportional to income. The provision of care is based on the principles of independent medical practice, free choice of physician and care facility, (predominantly) fee-for-service payment and compulsory health insurance. Belgium counts 11,697,557 inhabitants (01/01/2023) and more than 600,000 health care workers licensed to practice (European Observatory on Health Systems and Policies, 2020; Sciensano, 2020).

Planning the healthcare workforce (HWF) is critical to ensuring the health of the population, in order to:

- guarantee that the supply and demand for care match;
- avoid shortages;
- anticipate oversupply.

All of these are essential to ensure quality of care, the well-being of our professionals, budgetary sustainability, and the efficiency of social security.

The Federal Planning Commission Medical Supply was established in 1996 for this purpose, including regularly varying representatives from various sectors to ensure a balanced perspective. Supported by the HWF Planning Unit of the Ministry of Health, the Planning Commission evaluates the supply of healthcare professionals and advises the Federal Minister of Social Affairs and Public Health, who sets quotas to regulate the maximum number of practitioners. Planning was initially limited to doctors and dentists, but expansion to an increasing number of professionals is ongoing. The

Planning Commission takes different steps for each profession:

- Gain overview of the current HWF: description of the activity of a profession in the Belgian employment market;
- Drafting a basic scenario: evolution of the HWF (stock + in-out); no break with the historical trend: continuity scenario;
- Drafting alternative scenarios: according to the vision of future care developed by the Planning Commission, such as delegation of tasks, change in length of studies, work-life balance;
- Provide a formal recommendation: on the quotas for physicians and dentists, and on the planning of the other non-quota professions represented (nurses, nursing assistants, midwives, physiotherapists and speech therapists).

Like the needs of the population, planning is a dynamic and constantly improving process.

Given the complexity of the political system in Belgium, two Planning Commissions at the level of the communities (Federated level) have been created that are active since 2021 (one for the Flemish Community and one for the French-speaking Community). The regional Planning Commissions at the level of the communities examine the supply for subspecialties and the geographic distribution of professionals. It should also be noted that the education of HWF is a competence of the Flemish and French Communities.

Belgium has been consistently involved in European cooperation on health workforce planning. It participated in the JA HWF (2016) and remained engaged in the subsequent SEPEN initiative.

HEROES: Key Achievements

During HEROES (2023–2025), Belgium successfully achieved the following key milestones in strengthening its HWF planning system:

- **2024: Identification of the skills and abilities of the staff in charge of HWF planning**
In 2024, a survey was distributed to the staff of the different planning commissions in Belgium to identify their skills and abilities related to HWF planning.
- **2025: Introduction of the Belgian Practice Registry**
Belgium has implemented a national Practice Registry^[1] (for dentists) providing direct access to activity data for all healthcare professionals. The registry integrates data from multiple labour market and health registries into a common, nominal-level database, covering qualifications, specialties, visas, and places of activity. It enables more accurate identification of employment locations, levels of activity, and geographical distribution of supply. Supported by the Ministry of Health and Health Insurance bodies, and by a legal obligation for health professionals to complete and update their data (art. 42 law of 22/04/2019 on quality healthcare practice) (Wet van 22 april 2019, 2019, art. 42), the registry is expected to significantly improve data quality and future supply-side modelling.
- **2025: Stakeholder consultation to refine the planning model of the Federal Planning Commission**
In the first half of 2025, a targeted stakeholder survey was developed and disseminated to collect input from stakeholders for further optimization of the Belgian HWF planning and forecasting model. This survey focused on identifying priorities to refine future scenarios, with particular attention to:
 - the integration of epidemiological data to improve the estimation of future care demand;
 - the use of career-related data (well-being, burnout, inflows and outflows) to refine the measurement of care supply.

This survey facilitated the identification of available data and the assessment of the feasibility of integrating new elements into the existing planning model.
- **2025: National capacity-building programme for HRH planning and key stakeholders**
In September and October 2025, three targeted in-person training sessions were organized to strengthen the skills and capacities of staff involved in planning for human resources for health (HRH) and to enhance the synergy between the three Belgian planning commissions at Federal and Community levels. Commission members were brought together to deepen their understanding of the existing planning model, the measurement of the demand of care, and to reflect on potential improvements through the integration of epidemiological and health professionals career data. Through a combination of lectures and expert panels, this initiative has supported knowledge exchange, reinforced the role of stakeholders in the planning process, and contributes to the further optimisation of the Belgian planning model.

- **2025: Policy Dialogues on HWF transformation**

In November and December 2025, three Belgian policy dialogues were held within HEROES, bringing together members of the Planning Commissions and key stakeholders (including policy makers) to reflect on major challenges in HWF planning. The dialogues focused on digital transformation and skills needs, task shifting and task sharing, and the long-term sustainability of the HWF. Through structured discussions based on sectoral experiences, the exchanges helped clarify emerging priorities, policy options and implications for HWF planning and forecasting. By fostering cross-level and cross-sector dialogue, the policy dialogues strengthened shared understanding and supported more anticipatory and adaptive HWF planning in Belgium.

- **2025: Be.well.pro Study Day and networking event**

In December 2025, HEROES funding supported the Be.well.pro[2] study day and networking event, bringing together researchers, policymakers and practitioners to address the work-related mental well-being of health and social care sectors in Belgium. Building on the national Be.well.pro survey coordinated by Sciensano, the event highlighted the importance of systematically monitoring well-being and translating evidence into structural policy and organizational actions. This initiative strengthened awareness of HWF sustainability, supported cross-sector dialogue, and reinforced the integration of well-being considerations into HWF planning and long-term retention strategies.

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

Over the past three years, Belgium has gained important insights into the adoption, implementation and further development of HWF planning and forecasting through its participation in HEROES. During the adoption phase, a key lesson was that Belgium already benefits from strong institutional foundations, including established Planning Commissions, solid technical expertise, and mature modelling tools. However, HEROES reinforced the awareness that technical robustness alone is insufficient. Effective HWF planning and forecasting should explicitly reflect policy choices related to care organisation, skill mix, prevention, and long-term system transformation. Belgium's federal structure further highlighted the need to involve Federated entities early and meaningfully, as they are responsible for education, training and important parts of service organisation. HEROES showed that their engagement requires more than formal participation: shared analytical frameworks, common assumptions, and adequate planning skills are essential to ensure that planning outputs are understood, trusted and used across governance levels.

During the implementation phase, HEROES revealed that data governance is a central constraint shaping Belgian HWF planning and forecasting. Persistent time lags in labour market and activity data, fragmentation across registries, and limited insight into actual working time reduce the accuracy of forecasts. The gradual transition from professional cadastres to more activity-based data sources, notably the Practice Registry, marked a significant step forward, but also exposed remaining gaps, including limited visibility on inactivity, multidisciplinary team composition, and career interruptions. HEROES increased awareness of the need for longitudinal career monitoring, ideally starting at entry into training, to better understand attrition (employee turnover), part-time work, well-being-related outflow, and the discrepancy between training figures and effective participation in the HWF (by discipline). Another key lesson concerned the need to move beyond headcounts[3] and increasingly plan in terms of full-time equivalents, taking into account administrative burden, task distribution, technological developments, and evolving professional expectations regarding work–life balance.

The upscaling phase highlighted that future-proof HWF planning in Belgium will require a qualitative shift. Policy Dialogues underscored that, while Belgium is not “behind”, demographic ageing, particularly the rapid growth of the oldest age groups, combined with HWF shortages and “skill mismatches” creates a clear need for change. HEROES reinforced the urgency of moving towards an integrated, multidisciplinary planning model, requiring closer cooperation between Federal and Federated levels, especially in primary care zones and community-based services. Another important lesson was that planning horizons should be extended: short-term adjustments are insufficient without a clearer long-term vision on health system organisation. Finally, HEROES strengthened awareness that effective HWF planning and forecasting depends on continuous collaboration, transparency, and shared ownership across governance levels. These lessons are now driving a more integrated, data-informed, and consensus-based approach to HWF planning and forecasting in Belgium, better aligned with future care needs and system transformation goals.

Country level report based on the Sustainable Workforce Intelligence Planning Systems Framework

Domain 1: Political and contextual support

Belgium has a complex, highly institutionalized healthcare system shaped by its federal political structure and linguistic diversity. There are three official languages (Dutch, French and German) and three levels of power, i.e. Federal authorities, Federated entities (three regions based on territory and three communities based on language) and local authorities (provinces and municipalities). The system is based on compulsory social health insurance covering nearly the entire population, financed primarily through employer and employee contributions and administered by sickness funds. Healthcare provision is delivered by a mix of public, private and not-for-profit providers, while most healthcare professionals, particularly physicians, work as self-employed practitioners reimbursed largely through fee-for-service mechanisms. Jurisdiction over health policy and regulation of the health care system are shared among the Federal State and the Federated entities. The Federal authorities are responsible for compulsory health insurance, financing, regulation and licensing of healthcare profession(al)s, health products, system-wide monitoring, and patients' rights, supported by specialised institutions and stakeholder-based decision bodies. The Federated entities hold substantial autonomy over education and training of healthcare professionals, prevention and health promotion, primary care, long-term and the organisation of community-based services, with distinct administrative arrangements across linguistic regions and Brussels. In addition, scientific institutes, advisory bodies and a broad range of non-governmental stakeholders, such as professional associations, employers, trade unions, and patient organisations, also play an important role in shaping health policy. To facilitate cooperation between the Federal authorities and Federated entities, inter-ministerial conferences are regularly organized (European Observatory on Health Systems and Policies, 2020).

HWF planning in Belgium is embedded in this federal governance model and is therefore multi-level and collaborative. At the level of the Federal state, dedicated planning bodies, including planning commissions and technical units, develop projections of HWF supply and demand for regulated professions such as physicians. These forecasts are based on demographic trends, observed care utilisation, HWF activity data, and assumptions on productivity and career trajectories, and they inform policy advice, notably on training quotas. However, the implementation of these recommendations depends largely on the Federated entities, which are responsible for education and training capacities and for translating HWF needs into concrete training decisions (quotas). This structure makes planning both evidence-informed and consensus-driven, integrating regional perspectives, service organisation, and linguistic and cultural diversity (Sciensano, 2020). Continuous coordination, dialogue, and information exchange between Federal and Federated planning commissions are essential to align national objectives with regional realities.

Several contextual factors further shape HWF planning in Belgium. The decentralised organisation of healthcare services and education leads to regional variation in service delivery models, care utilisation patterns, and HWF needs, requiring planning processes that explicitly account for territorial diversity. Belgium's reliance on self-employed professionals complicates measurement of actual activity and working time, as well as the geographical distribution of supply. At the same time, demographic ageing of both the population and the HWF, especially General Practitioners (GPs), epidemiological transitions towards chronic conditions and multimorbidity, evolving models of care (influenced by technological developments), and changing expectations regarding work-life balance and career sustainability increasingly affect both the future demand for care and the available HWF. Data fragmentation across multiple registries and institutions remains a challenge in this governance context, reinforcing the importance of data integration and inter-institutional collaboration. Together, these political and contextual elements provide both the framework and the constraints within which HWF planning and forecasting in Belgium are developed and continuously adapted.

Domain 2: Human Resources for Health (HRH) governance

As Belgium has a long tradition of HWF planning, several major stakeholders are already actively involved. Their involvement is laid down by law (European Observatory on Health Systems and Policies, 2020).

Evaluation of needs concerning the supply of human resources for health is a Federal competence. The Planning Commission of Medical Supply is responsible for assessing HWF needs in the professions of physicians, dentists, physiotherapists, nurses, midwives and speech therapists (BS-MB, 29 August 1996). The Commission provides non-binding opinions on HWF planning to the Minister of Social Affairs and Public Health. The Planning Unit for the Supply of Health Care Professions brings administrative and technical support to the Planning Commission. The Planning Unit quantifies and predicts the staffing and HWF needs of health care professionals using modelling. Based on the advice of the Planning Commission, a system of quotas for physicians and dentists is established. An overall quota is set up for Belgium and stratified by community (sub-quotas). As the organization of education is a competence for the Flemish and French communities, these sub-quotas are managed by the Federated entities, more specifically by the regional Planning Commissions (BS-MB, 31 January 2014) (European Observatory on Health Systems and Policies & World Health Organization, 2023).

The table below lists the stakeholders in the Belgian HWF planning process, their involvement and level of influence and power on the three key dimensions, more specifically: data, planning process and tools, and planning skills. They are grouped into categories for ease of reading. The detailed list can be found in Annex 1.

Name of stakeholder (grouped)	Type of stakeholder	Involvement	DATA		PROCESS		SKILLS	
			I	P	I	P	I	P
Planning Commission(s)	Other - Planning commission	Involved	H	H	H	H	H	H
Cabinets of the Ministers of Health / Welfare	Ministries	Partly involved	H	H/L	H	H	H/L	H/L
Cabinets of the Ministers of Education	Ministries	Partly involved	H	H	H	L	H	H
Cabinets of the Ministers of Labour	Ministries	Not yet involved	H	H	L	L	H	H
Ministries of Health	Ministries – Civil Services	Partly involved	H/L	H/L	H	H/L	H/L	H/L
Ministries of Education	Ministries – Civil Services	Partly involved	H	H	H	H	H	H
Ministries of Labour	Ministries – Civil Services	Not yet involved	H	H	L	L	H	H
Health professionals orders	Health professional order	Involved	H	L	H	H	H/L	H/L
Public Health Insurance	Governmental Agency	Involved	H	H	H	H	H	H
Private Health Insurance Funds	Social Insurance Fund	Involved	H	H	H	H	H	H
Universities & Institutions for higher education	Academia	Involved	H	H	H	H	H	H
Social Profit and Health Care employers' federations	Society	Not yet involved	L	L	L	L	L	L
Federal and regional statistical institutes	Statistics / Research Institute	Partly involved	H	H	L	L	L	L
Research institutes	Statistics / Research Institute	Partly involved	H/L	H/L	H/L	H/L	H/L	H/L
Patient organizations	Society	Partly involved	L	L	L	L	L	L
Federal and regional labour market institutions	Governmental Agency	Not yet involved	H	H	H	L	H	L

Abbreviations

H	High
L	Low
I	Interest
P	Power

Stakeholder landscape: roles, power, and interests in HWF Planning

The stakeholder landscape relevant to HWF planning and forecasting in Belgium is broad and multi-level, reflecting the federal governance structure. It includes planning and advisory bodies, federal and federated authorities, health care and educational organisations, health professional orders, employers' and social-profit federations, research and statistical institutions, patient organisations, and labour-market actors.

HWF planning in Belgium is characterized by a highly institutionalized yet differentiated involvement of stakeholders, reflecting the federal organization of the health system and the legal allocation of competences between the Federal state and the Federated entities. Core responsibilities are concentrated within public authorities and formally mandated planning bodies, while a broader set of actors contribute indirectly through data provision, implementation, or advocacy. This results in a government-led, but consensus-oriented planning system. A central role is designated for the Federal Planning Commission, operating under the authority of the Federal Minister of Social Affairs and Public Health and supported by the Federal Public Service (FPS) Health, Food Chain Safety and Environment. This Commission brings together representatives of ministries, communities, universities, sickness funds, healthcare professions and the National Institute for Health and Disability Insurance (NIHDI). It holds high interest and high power across data, processes and planning skills, as it is legally mandated to develop forecasts of supply and demand for regulated professions and to formulate advice on training quotas. Their influence spans data integration, methodological choices and planning assumptions.

NIHDI and the Intermutualistic College play a strategic supporting role by providing detailed data on reimbursed healthcare services, covering both provider performance (supply side) and population care consumption patterns (demand side), thereby informing HWF planning analyses. At the Federated level, Community-based Planning Commissions include key regional stakeholders such as professional organisations, universities, public administrations, and patient representatives. Their interest in HWF planning is high, given their responsibility for education and training capacity, but their power over forecasting tools and national assumptions is more limited. Education ministries and administrations therefore exert substantial influence on the implementation of planning outcomes, even though they are not responsible for HWF forecasting itself. This explains the central importance, but also the structural complexity, of coordination between health and education authorities in Belgium.

Professional orders and councils (medical, nursing, dental, pharmaceutical and paramedical) represent another key stakeholder group. Their interest and power are high regarding professional recognition, standards and register data, while their influence on planning methodologies and final policy decisions is more limited. Universities and universities of applied sciences (University Colleges) similarly have strong interest in planning outcomes affecting student intake and training capacity, but their role is largely indirect and mediated through Planning Commissions. Statistical and research institutions have high influence on data quality and availability but low formal decision-making power. Employer federations, trade unions and patient organisations contribute through advocacy and contextual input but are not structurally embedded in planning bodies. Finally, local care providers and individual healthcare organisations have limited interest and power in national HWF planning, as strategic decisions are taken at federal and community levels, while providers operate within regulatory and financial constraints defined elsewhere. This differentiated allocation of roles explains why Belgian HWF planning combines strong institutional steering with broad consultation, and why coordination, data sharing and negotiated alignment across actors remain central to its functioning.

During the implementation of HEROES, enhanced collaboration was achieved with a broad range of stakeholders at federal, regional and sectoral level. Firstly, at the federal level, cooperation was strengthened with the Federal Planning Commission, including the subcommittee on HWF planning (nurses, physicians and dentists), as well as with the cabinet of the Federal Minister of Public Health. Secondly, at the regional level (Flanders), contacts were made with the Flemish Planning Commission, the Department of Care, and professional organisations representing healthcare providers. This included the Nursing Network – the Flemish professional organisation for nurses – and the Flemish Dental Association. In addition, cooperation was reinforced with several umbrella organisations representing healthcare institutions and providers, namely GIBBIS, Santhea, Zorgnet Icuuro and Unessa.

Depending on future actions set up to improve the existing HWF planning, the network of actively involved stakeholders could be expanded.

Domain 3: HWF planners' capabilities

At the start of HEROES, many of the core skills required for HWF planning in Belgium were already present among the actors responsible for planning and the key stakeholders. Skills within the domains such as 'data analytics and assessment', 'health policy development and HWF planning', 'HWF management', 'finance', and 'partnership and communication' are present within organisations directly involved in HWF planning or key stakeholders.

Stakeholders with central roles in HWF planning collectively contribute to complementary skill sets. Data-related skills are distributed across institutions responsible for registries, reimbursement data, labour market information, and population statistics, while modelling and interpretation skills are concentrated within the Planning Commissions and academic experts involved in forecasting exercises. Soft skills, such as coordination, communication, and consensus-building, are also an integral part of the Belgian planning system, given the multi-level governance structure and the need for alignment between Federal and Federated actors.

While these skills provided a strong starting point, HEROES reinforced awareness that future challenges will require a further strengthening and adaptation of existing capabilities rather than a simple extension of current practices. One key area concerns the increasing complexity of data and tools. The gradual transition from professional cadastres towards more activity-based and near real-time data sources, such as the Practice Registry, requires enhanced skills in data governance, data linkage, quality assessment, and longitudinal analysis. As planning increasingly moves beyond headcounts towards full-time equivalents, career trajectories, and working time distribution, planners need to further consolidate their capacity to interpret heterogeneous data sources and to translate them into coherent planning assumptions.

In parallel, the evolving organisation of care creates new analytical and modelling demands. The expansion of integrated care models, structured care pathways for chronic conditions, multidisciplinary and interprofessional practices, and the redesign of the hospital landscape challenge traditional, profession-specific planning approaches. Addressing these developments requires skills to conceptualise and model interactions between professions, task allocation, and skill mix, as well as the ability to reflect technological progress and digitalisation in productivity assumptions. Although Belgium already integrates some advanced modelling elements, HEROES highlighted the importance of progressively strengthening expertise in multi-professional and interdisciplinary planning, in order to support a more integrated view of future HWF needs.

Beyond technical competencies, HEROES underlined the continued relevance of partnership and communication skills. Optimising cooperation between the three Planning Commissions at Federal and Federated levels, and ensuring effective dialogue with policy-makers, professional organisations, and other stakeholders, requires the ability to translate technical results into policy-relevant messages and to integrate feedback from the field into planning exercises. As planning advice increasingly needs to support long-term strategic choices (e.g., a shift towards primary care, prevention, and community-based services), skills related to scenario development, policy interpretation, and stakeholder engagement become even more critical.

Looking ahead, technological innovation, demographic ageing, the rising prevalence of chronic conditions, and changing professional expectations will further increase the demands placed on HWF planners. HEROES contributed to a shared understanding that addressing these challenges will require continuous learning and institutional collaboration. Rather than focusing on gaps, the Belgian experience highlights the need to build on existing strengths by reinforcing analytical, modelling, and collaboration skills to support future-oriented HWF planning (i.e., robust, responsive, and aligned with future health system transformation).

From plan to training activities, skills and competency gains during HEROES

During the implementation of HEROES, Belgium initiated a targeted capacity-building programme aimed at strengthening the skills of HWF planners and key stakeholders involved in the planning process. Using HEROES budget, three in-person training sessions were organised in September and October 2025, with participation from both Federal and Federated levels. Each session gathered between 20 and 30 participants, mainly medical professionals, policy makers and experts representing universities, hospitals, federal health services, planning commissions, healthcare networks, ministerial cabinets and professional organisations. The profile of participants corresponded to the intended target group, namely stakeholders with a direct or strategic role in HWF planning and policy formulation.

The scope of the trainings was necessarily selective. Given the limited duration of HEROES and the range of challenges facing HWF planning, the sessions focused primarily on the demand side of the Federal planning model and the usefulness of epidemiological data to refine it. Lectures and moderated panels with experts were alternated. Specific attention was given to the Belgian Burden of Disease (BeBOD) study and to projection tools such as the (PRO)jecting Medical Spending) PROMES microsimulation model, which were used to stimulate discussion on how demand-side dynamics could be better integrated into HWF planning. Interactive group work supported peer learning and allowed participants to exchange perspectives on data availability, methodological choices, and policy relevance.

In terms of skills development, the trainings supported improved analytical capacity among participants, particularly regarding the interpretation of epidemiological projections and their potential implications for HWF planning. They also strengthened participants' ability to critically assess how different data sources (i.e., demographic, epidemiological and utilisation data) can be combined and translated into planning insights. Equally important, the sessions contributed to reinforcing soft skills such as cross-institutional communication, shared problem framing, and collaborative reflection across governance levels. Participants reported that the opportunity to discuss planning challenges from different professional and institutional perspectives was a key added value of the programme.

Other important areas, such as supply-side modelling, task shifting, digital transformation, artificial intelligence, HWF well-being, and geographical distribution, were acknowledged but not addressed in depth. The experience also highlighted the importance of structuring discussions carefully to maintain focus, given the complexity of the health system and the diversity of stakeholder interests.

Overall, the capacity-building activities implemented during HEROES contributed to strengthening shared understanding, analytical reflection, and collaboration among Belgian HWF planners and stakeholders. They also helped to identify priorities for future training efforts. As such, these activities are best seen as a first step in a longer-term learning trajectory. Further trainings, potentially addressing longitudinal workforce monitoring and advanced data analytics, are expected to be pursued beyond the completion of HEROES as part of sustainability and follow-up actions.

Domain 4: HWF data and models

HWF Data: Sources

The information available to the Planning Commission is complex. The data are extracted from different databases, anonymised, and analysed to provide the most detailed and realistic picture of the activity of health professionals in Belgium. For most of the professions within healthcare, the data necessary for HWF planning are available.

On the supply side, the main source is the Federal Database of Health Care Professionals which consists of all professionals licensed to practice in Belgium, including information on their degree, visa, nationality, age and sex. Since this database does not contain information on actual professional activities, it is complemented by data on salaried and self-employed (independent) healthcare workers. Other data suppliers are the National Statistics Office, the Ministry of Labour, the Ministry of Health, the National Public Health Agency, the Ministries of Education and the Universities and Medical Schools. These sources provide individual-level and aggregated data on the active HWF, students in training, graduates, and employment settings. Data are anonymized to protect practitioners' privacy and quality-checked before use, and ongoing efforts aim to integrate all sources into a common database, which will allow precise mapping of employment locations, hospital service affiliations, home care coverage, and geographic distribution of professionals. In addition, for example, in order to map the impact of technological evolutions and the move towards more interdisciplinary care (skill mix), additional data are needed.

On the demand side, information is more limited. HWF needs are inferred indirectly from epidemiological data, population demographics, disease burden projections, and service utilization patterns. While the availability of supply data is extensive, its integration and analysis for planning purposes remain a central task, and additional data, particularly on skill mix, technological changes, and interdisciplinary care, are needed to refine HWF projections further.

Advanced Minimum Data Set: achievements under HEROES

At start of HEROES, the availability and coverage of key variables on both the supply side (labour force, training, retirement, migration) and the demand side (population and health consumption) were largely adequate in Belgium. During the last three years, improvements focused on strengthening data availability, consistency, and usability in the area of supply and demand. Efforts were made to improve data linkage between existing sources, enhance temporal coverage, and refine key indicators such as FTE, geographical distribution, and professional characteristics. Particular attention was given to better aligning supply-side HWF data with demand-side population and health consumption data. In addition, ongoing work aims to reinforce cooperation and collaboration between data providers and stakeholders, facilitating more integrated use of administrative and statistical sources. These efforts contribute to improved data completeness, comparability, and sustainability of the quantitative dataset, ensuring that the AMDS remains fit for purpose and continues to support robust HWF planning.

Advanced Minimum Data Set

Quantitative data set	Supply side					Demand side	
	Labour force	Training	Retirement	Outflow migration	Inflow migration	Population	Health consumption
Profession	X	X	X	X	X		X
Age	X	X	X	X	X	X	X
Head count	X	X	X	X	X	X	X
FTE	X	X			X		
Geographical area	X	X	X	X	X	X	X
Specialization	X	X	X	X	X		X
Country of first qualification	X	X	X	X	X		H/L
Gender	X	X	X	X	X	X	X

Qualitative data set	
	Care organisation
Teamwork	X
Task shifting and skill-mix	X
Reconfiguring health services including digital	X
	Health Indicators
Mortality and morbidity of HWF	X
Mental health and well-being of HWF	X
HWF equity	
	Labour market
Financial investment, economical background	
Performance and productivity	X

Data available and used for planning
Data available but not used for planning
Data not available but needed for planning
Data available but needs improvement
Data available/included as a result of HEROES

HWF Data: improvements

During HEROES, Belgium advanced several key actions aimed at strengthening the data foundations for HWF planning. A major achievement was the implementation of the Practice Registry, providing structured and up-to-date information on professional activity. This registry represents an important step towards improving the availability and consistency of activity-related data for HWF planning purposes and supports a more accurate understanding of the active HWF within a profession.

In parallel, HEROES facilitated structured discussions among planning bodies and stakeholders on the potential integration of epidemiological data into the existing HWF planning model. These exchanges focused on exploring how population health trends and disease projections could complement current demographic and utilisation-based approaches, particularly on the demand side of planning. While no formal integration was implemented during the project period, these discussions laid important groundwork and remain an ongoing topic for future development within the Belgian HWF planning framework.

HWF Data: HEROES contributions and future directions

Building on the insights and groundwork established during HEROES, Belgium intends to further strengthen the sustainability, scope, and strategic relevance of its HWF data and planning infrastructure in the period following the project. A central future objective is the progressive development of a common data environment that integrates information from multiple labour market, health, and administrative sources into a coherent and regularly updated database. This ambition reflects the growing recognition that timely, consistent, and interoperable data are essential for evidence-based decision-making, enabling policymakers to respond quickly to emerging workforce needs, anticipate future shortages, and plan strategically for the long-term development of the health workforce.

A key sustainability priority concerns the extension of monitoring beyond selected regulated professions towards a more comprehensive coverage of all health care professions. This includes the ambition to move towards annual data updates, allowing planning bodies to reduce time lags and to better capture changes in activity, HWF participation, and service delivery patterns. Improved data timeliness is expected to enhance both the analytical robustness of forecasting exercises and their policy relevance in a rapidly evolving health system context.

Future actions also emphasise the importance of continued cooperation and collaboration between the different planning commissions at Federal and Federated levels. Strengthening information exchange, aligning assumptions, and sharing analytical tools are seen as essential conditions for maintaining coherence across governance levels. Sustained collaboration will also be required to further explore the integration of new data sources into existing planning models. While discussions on this integration have already taken place during HEROES, further analytical work and institutional alignment will be needed to translate these insights into operational planning tools.

By focusing on data integration, regular updating, comprehensive professional coverage and closer institutional cooperation, Belgium aims to ensure that its HWF planning system remains robust, adaptive, and aligned with future care needs and policy priorities.

HWF Planning Models: design, application and HEROES contribution to HWF Planning Models

In Belgium, HWF planning is based on a long-standing, formalised stock-and-flow planning model that is applied at national level and updated on a regular basis. The model was developed and is maintained under the responsibility of the Federal Planning Commission. It was developed to support evidence-informed policy decisions on HWF planning, most notably the regulation of training inflows for physicians and dentists, and to provide structured insights into the evolution of other regulated health professions.

The Belgian HWF planning model applies primarily to regulated health professions, including physicians, dentists, nurses, nursing assistants, midwives, physiotherapists and speech therapists. For physicians and dentists, the model directly informs federal training quotas. For other professions, it provides analytical input and recommendations without binding quotas. Planning is conducted at national level, while Community-level Planning Commissions contribute by advising on sub-specialty needs and translating federal recommendations into education and training decisions.

The federal planning model follows a four-step, profession-specific process, implemented through dedicated working groups within the Planning Commission. First, it establishes an overview of the current HWF capacity by describing the activity of a profession on the Belgian labour market. As the Federal Database of Health Care Professionals alone does not capture actual activity levels, register data are linked with other administrative and labour market databases, as allowed by law[4]. This enables analysis of how many professionals are active, their distribution across healthcare sub-sectors and regions, their activity levels, and changes over time. Historical data spanning several years are used to identify trends.

Second, a basic (continuity) scenario is developed. On the supply side, future HWF capacity is projected using a stock-and-flow approach, starting from the current active HWF and accounting for inflows (new graduates in Belgium and internationally trained professionals) and outflows (retirement, mortality). Projections are expressed mainly in terms of numbers of active professionals, with activity levels and densities also analysed. On the demand side, future care needs are estimated primarily based on demographic projections (population size, age and sex structure) and observed care consumption patterns.

Third, alternative scenarios are developed to explore deviations from historical trends. These scenarios incorporate assumptions related to future policy choices and contextual developments, such as changes in work-life balance, task delegation, length of studies or organisation of care. Assumptions are defined within the Planning Commission working groups and allow testing of different visions of future care delivery.

Finally, based on the comparison between projected supply and demand, the Planning Commission formulates a formal recommendation. For quota professions, this includes advice on federal training quotas; for other professions, it highlights expected imbalances and planning considerations. Projections typically cover a horizon of 20 to 25 years, with results presented at five-year intervals, including (weighted and unweighted) HWF densities.

The model primarily supports training inflow regulation and medium- to long-term HWF planning. While planning is still largely profession-specific, initial steps have been taken to integrate skill mix, notably in dentistry (dentists and dental hygienists). Broader integration of multidisciplinary planning remains a future development, dependent on clearer definitions of transferable tasks and available data. The model is not formally evaluated as a standalone tool but is regularly reviewed and updated through its repeated application, stakeholder consultation and policy use, ensuring its continued relevance for Belgian HWF policy.

During HEROES, we explored the possibilities to integrate epidemiological data into the existing planning model, through policy dialogues and technical discussions; while no formal integration was completed, these exchanges laid important groundwork and remain an ongoing priority. Furthermore, the options were weighed to systematically integrate quantitative and qualitative data on healthcare worker careers. This integration will require further development and coordination beyond HEROES, particularly to enable longitudinal monitoring from education through professional practice.

HWF Planning Models: HEROES contribution and future directions

The Policy Dialogues which were held during the project highlighted both the achievements and the areas needing further attention. Three dialogues focused on digital transformation and HWF skills, task shifting and sharing, and the sustainability of HWF forecasting and planning. These sessions reinforced the need for continuous collaboration across Federal and Federated levels, but also revealed that, during HEROES, the participants were primarily federal-level actors, leaving regional and also European perspectives often underrepresented. The dialogues fostered awareness of the evolving demands on the HWF, including technological developments, multidisciplinary practices, integrated care, and changing task allocation, and underscored the importance of linking planning outputs to HWF well-being, retention, and equitable geographic distribution.

Due to the limited time of HEROES, initiatives to integrate quantitative and qualitative data on the careers of healthcare workers into the existing planning model, were not sufficiently addressed and should be further developed post-HEROES. Developing a longitudinal perspective on professional trajectories, including HWF entry, retention, career changes, and attrition (employee turnover), will enhance the accuracy of future HWF projections and enable more informed policy decisions. This step is crucial for transitioning from profession-specific planning toward a more integrated and multidisciplinary approach that aligns HWF planning with evolving healthcare demands.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

Looking ahead, Belgium aims to progressively evolve from profession-specific planning toward an integrated, multidisciplinary approach, reflecting broader health system transformations, including new care pathways, task redistribution, and interdependence between professions. Key sustainability measures include: the establishment of a common database integrating multiple data sources, annual updating of HWF information, monitoring of all healthcare professions, and development of new analytical perspectives to support more sophisticated forecasting. This will allow the system to better respond to demographic changes and to anticipate shifts in healthcare demand.

Moreover, it is important to continue making efforts to bring the right stakeholders together. Ensuring that all relevant perspectives are represented will strengthen dialogue, improve coordination, and support more effective and sustainable HWF planning.

Governance arrangements will also be strengthened through enhanced coordination within the Interfederal Committee, including clearly defined roles, responsibilities, outputs, and regular meetings to leverage political impact and reduce fragmentation. Future actions will aim to ensure that planning considers both policy choices and HWF dynamics, including digital skills, career trajectories, and the implications of care redesign. By combining robust, up-to-date data with sustained stakeholder engagement and improved analytical capacity, Belgium intends to maintain a responsive, evidence-informed and forward-looking HWF planning system capable of supporting both short- and long-term health system needs, while providing a foundation for ongoing policy dialogue and continuous improvement.

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ANNEX 1. STAKEHOLDER LIST

Name of stakeholder		Type of stakeholder	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
				I	P	I	P	I	P
Planning commissions									
1	Belgium - Federal level: Federal Planning Commission	Other - Planning commission	Already involved	H	H	H	H	H	H
2	Belgium - Subnational level: Wallonia / Brussels: Planning Commission (COMMISSION DE PLANIFICATION de la fédération Wallonie-Bruxelles)	Other - Planning commission	Already involved	H	H	H	H	H	H
3	Belgium - Subnational level: Flanders : Planning Commission (Vlaamse PLANNINGSCOMMISSIE)	Other - Planning commission	Already involved	H	H	H	H	H	H
Ministers (and their cabinets)									
4	Belgium - Vice prime minister and minister of social affairs and public health	Ministry	Already involved	H	H	H	H	H	H
5	Flanders - Vice Minister-President and Minister of Welfare, public health and family (Viceminister-president van de Vlaamse Regering en Vlaams minister van Welzijn, Volksgezondheid en Gezin	Ministry	Not yet involved	H	L	H	H	L	L
6	Wallonia - Vice-President of the Walloon Government, Minister for Employment, Training, Health, Social Action and the Social Economy, Equal Opportunities and Women's Rights (Vice-Présidente du Gouvernement wallon, Ministre de l'Emploi, de la Formation, de la Santé, de l'Action sociale et de l'Économie sociale, de l'Égalité des chances et des Droits des Femmes)	Ministry	Not yet involved	H	L	H	H	L	L

Name of stakeholder		Type of stakeholder	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
				I	P	I	P	I	P
7	French speaking community - Fédération Wallonie-Bruxelles - Vice-President and Minister for Children, Health, Culture, Media and Women's Rights of the Wallonia-Brussels Federation (Vice-Présidente et Ministre de l'Enfance, de la Santé, de la Culture, des Médias et des Droits des Femmes de la Fédération Wallonie-Bruxelles)	Ministry	Not yet involved	H	L	H	H	L	L
8	French speaking community - Fédération Wallonie-Bruxelles - Minister for Higher Education, Further Education, Scientific Research, University Hospitals, Youth Welfare, Houses of Justice, Youth, Sport and the Promotion of Brussels (Ministre de l'Enseignement supérieur, de l'Enseignement de la promotion sociale, de la Recherche scientifique, des Hôpitaux universitaires, de l'Aide à la jeunesse, des Maisons de justice, de la Jeunesse, des Sports et de la Promotion de Bruxelles)	Ministry	Already involved	H	L	H	H	L	L
9	German speaking community - VICE-MINISTER-PRESIDENT MINISTER FOR HEALTH AND SOCIAL AFFAIRS, REGIONAL PLANNING AND HOUSING (VIZE-MINISTERPRÄSIDENT MINISTER FÜR GESUNDHEIT UND SOZIALES, RAUMORDNUNG UND WOHNUNGSWESEN	Ministry	Not yet involved	H	L	H	H	L	L

Name of stakeholder		Type of stakeholder	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
				I	P	I	P	I	P
10	Brussels - Minister - Member of the College of the French Community Commission (COCOF), responsible for Social Action and Health + Member of the united College of the Joint Community Commission (COCOM), responsible for Health and Social Action (jointly with the Dutch-speaking Minister) (Membre du Collège de la Commission communautaire française (COCOF), chargé de l'Action sociale et de la Santé + Membre du Collège réuni de la Commission communautaire commune (COCOM), chargé de la Santé et de l'Action sociale (conjointement avec la Ministre néerlandophone))	Ministry	Not yet involved	H	L	H	H	L	L
11	Brussels - Minister - Chairman of the Board of the Flemish Community Commission (VGC), in charge of Budget, Welfare, Health, Family and Urban Policy and Member of the United College of the Joint Community Commission (GGC - COCOM), in charge of Health and Welfare (together with the French-speaking Minister) (Voorzitter van het College van de Vlaamse Gemeenschapscommissie (VGC), belast met Begroting, Welzijn, Gezondheid, Gezin en Stedelijk Beleid en Lid van het Verenigd College van de Gemeenschappelijke Gemeenschapscommissie (GGC), belast met Gezondheid en Welzijn (samen met de Franssprekende Minister))	Ministry	Not yet involved	H	L	H	H	L	L
12	Flanders - Minister of education	Ministry	Already involved	H	H	H	L	H	H
13	French speaking community - Fédération Wallonie-Bruxelles - Minister of Education	Ministry	Already involved	H	H	H	L	H	H
14	German speaking community - Minister of Education and Scientific Research	Ministry	Not yet involved	H	H	H	L	H	H

	Name of stakeholder	Type of stakeholder	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
				I	P	I	P	I	P
15	Brussels - Minister - Member of the Board of the Flemish Community Commission (VGC) in charge of Education	Ministry	Not yet involved	H	H	H	L	H	H
16	Brussels - Minister-President - Member of the College of the French Community Commission (COCOF), responsible for Policy on Education, Crèches, Culture, the Disabled, Tourism and School Transport (Politique de l'Enseignement, des Crèches, de la Culture, des Personnes handicapées, du Tourisme et du Transport scolaire)	Ministry	Not yet involved	H	H	H	L	H	H
17	Belgium - Deputy Prime Minister and Minister for the Economy and Labour	Ministry	Not yet involved	H	H	L	L	H	H
18	Flanders - Minister for Employment, Economy, Innovation & Agriculture	Ministry	Not yet involved	H	H	L	L	H	H
19	Brussels - Minister for Employment and Vocational Training (Ministre de l'Emploi et de la Formation professionnelle)	Ministry	Not yet involved	H	H	L	L	H	H
Ministries (civil services)									
20	Belgium - FPS (Federal Public Service) Health, Food Chain Safety and Environment	Ministry - Civil Service	Already involved	H	H	H	H	H	H
21	Flanders - Department of Care (Departement Zorg)	Ministry - Civil Service	Not yet involved	L	L	H	L	L	L
22	Wallonia - AViQ - Department of Health and Wellbeing (Département du Bien-être et de la Santé)	Ministry - Civil Service	Not yet involved	L	L	H	L	L	L
23	German speaking community - Ministry of the German-speaking Community - Department of Health, Family and the Elderly	Ministry - Civil Service	Not yet involved	L	L	H	L	L	L
24	Brussels - Administration of the Flemish Community Commission (VGC) - General Directorate Welfare, Health and Family	Ministry - Civil Service	Not yet involved	L	L	H	L	L	L
25	Brussels - Administration of the French Community Commission (COCOF) - Department of Social Affairs and Health (Direction d'Administration des Affaires sociales et de la Santé)	Ministry - Civil Service	Not yet involved	L	L	H	L	L	L

	Name of stakeholder	Type of stakeholder	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
				I	P	I	P	I	P
26	Brussels - United College Services (civil service of the Joint Community Commission) - Department of Health and WellBeing (aid to persons)	Ministry - Civil Service	Not yet involved	L	L	H	L	L	L
27	Brussels - Iriscare	Governmental Agency	Not yet involved	L	L	H	L	L	L
28	Flanders - Department of Education (Departement Onderwijs)	Ministry - Civil Service	Already involved	H	H	H	H	H	H
29	Wallonia - Fédération Wallonie-Bruxelles - General Administration of Education	Ministry - Civil Service	Already involved	H	H	H	H	H	H
30	German speaking community - Ministry of the German-speaking Community - Department of Education	Ministry - Civil Service	Not yet involved	H	H	H	H	H	H
31	Brussels - Administration of the Flemish Community Commission (VGC) - General Directorate Education	Ministry - Civil Service	Not yet involved	H	H	H	H	H	H
32	Brussels - Administration of the French Community Commission (COCOF) - Department of Education and Vocational Training (Direction d'Administration de l'Enseignement et de la Formation professionnelle)	Ministry - Civil Service	Not yet involved	H	H	H	H	H	H
33	Belgium - FPS Employment, Labour and Social Dialogue	Ministry - Civil Service	Not yet involved	H	H	L	L	H	H
34	Flanders - Department of Work and Social Economy	Ministry - Civil Service	Not yet involved	H	H	L	L	H	H
35	Wallonia - Department of Employment and Vocational Training (SPW Département de l'Emploi et de la Formation professionnelle)	Ministry - Civil Service	Not yet involved	H	H	L	L	H	H
Health care organisations									
36	RIZIV - INAMI	Governmental Agency	Already involved	H	H	H	H	H	H
37	Intermutualistic College / Collège intermutualiste / Intermutualistisch College	Social Insurance Fund / Company	Already involved	H	H	H	H	H	H
Educational organisations									
38	University institutions of the Flemish Community / Institutions universitaires de la Communauté flamande / Universitaire instellingen van de Vlaamse Gemeenschap	Academia	Already involved	H	H	H	H	H	H

Name of stakeholder		Type of stakeholder	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
				I	P	I	P	I	P
39	University institutions of the French Community / Institutions universitaires de la Communauté française / Universitaire instellingen van de Franse Gemeenschap	Academia	Already involved	H	H	H	H	H	H
40	Flanders - Flemish Council of Universities of Applied Sciences (Vlaamse Hogescholenraad)	Academia	Not yet involved	H	H	H	H	H	H
41	Wallonia - universities of applied sciences	Academia	Not yet involved	H	H	H	H	H	H
Health professional orders									
42	Supreme Council for medical specialists and general practitioners	Health Professional Order	Already involved	H	L	H	H	H	H
43	Council for Dentistry	Health Professional Order	Already involved	H	L	H	H	H	H
44	Federal Council for Mid-Wives	Health Professional Order	Already involved	H	L	H	H	H	H
45	Federal Council for Physiotherapy	Health Professional Order	Already involved	H	L	H	H	L	L
46	Federal Council for Paramedic Professions	Health Professional Order	Already involved	H	L	H	H	L	L
47	Federal Council for Mental Health Care Professions	Health Professional Order	Already involved	H	L	H	H	L	L
48	Federal Council for Nursing	Health Professional Order	Already involved	H	L	H	H	L	L
49	Federal Council for Pharmacists	Health Professional Order	Not yet involved	H	L	H	H	L	L
50	The Francophone Association of Chief Medical Officers, Medical Directors and Medical Directors (L'Association francophone des Médecins-Chefs, des Médecins-Directeurs et des Directeurs médicaux)	Health Professional Order	Not yet involved	H	L	H	H	L	L
51	Flemish Association for Chief Physicians (Vlaamse Vereniging voor Hoofddartsen)	Health Professional Order	Not yet involved	H	L	H	H	L	L
Social Profit and Health Care employers' federations									
52	Belgium - Unisoc	Society	Not yet involved	L	L	L	L	L	L
53	Flanders - Verso	Society	Not yet involved	L	L	L	L	L	L
54	Flanders - Zorgnet-Icuro	Society	Not yet involved	L	L	L	L	L	L
55	Wallonia - UNIPSO	Society	Not yet involved	L	L	L	L	L	L
56	Wallonia - SANTHEA	Society	Not yet involved	L	L	L	L	L	L
57	Wallonia - UNESSA	Society	Not yet involved	L	L	L	L	L	L

	Name of stakeholder	Type of stakeholder	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
				I	P	I	P	I	P
58	Brussels - BRUXEO	Society	Not yet involved	L	L	L	L	L	L
59	Brussels - GIBBIS	Society	Not yet involved	L	L	L	L	L	L
Research and Statistics institutions									
60	Belgium - Statbel	Statistics / Research Institute	Not yet involved	H	H	L	L	L	L
61	Flanders - Statistics Flanders	Statistics / Research Institute	Not yet involved	H	H	L	L	L	L
62	Wallonia - Walstat	Statistics / Research Institute	Not yet involved	H	H	L	L	L	L
63	Brussels - Brussels-Capital Health and Social Observatory	Statistics / Research Institute	Not yet involved	H	H	L	L	L	L
64	Kruispuntbank van de Sociale Zekerheid	Statistics / Research Institute	Already involved	H	H	L	L	L	L
65	Federaal Planbureau	Statistics / Research Institute	Not yet involved	H	L	H	H	H	L
66	KCE	Statistics / Research Institute	Already involved	H	L	H	H	H	H
67	OSE	Statistics / Research Institute	Not yet involved	L	L	L	L	L	L
68	European Observatory on Health Systems and Policies	Statistics / Research Institute	Not yet involved	L	L	L	L	L	L
69	Sciensano	Statistics / Research Institute	Already involved	H	H	L	L	L	L
Patient organisations									
70	La LUSS. Ligue des usagers des services de santé.	Society	Not yet involved	L	L	L	L	L	L
71	Vlaams Patiëntenplatform	Society	Not yet involved	L	L	L	L	L	L
Labour market									
72	VDAB	Governmental Agency	Not yet involved	H	H	H	L	H	L
73	ACTIRIS	Governmental Agency	Not yet involved	H	H	H	L	H	L
74	FOREM	Governmental Agency	Not yet involved	H	H	H	L	H	L

Abbreviations

H	High
L	Low
I	Interest
P	Power

COUNTRY REPORT

CZECHIA



6.2 COUNTRY REPORT: CZECHIA

Introduction

Czechia is a landlocked country in Central Europe. It represents a transition between west and east, north and south. The country itself is without many extremes when it comes to distances, landscape character or weather conditions.

- Population: 10.874 mil.[5] (21 % at age 65+)
- Area: 78 871 km² (population density: 138 inh./km²)
- Life expectancy at birth: males 76.1 years, females 82.0 years[6]
- GDP per capita: 49 122 USD[7]
- Health spending per capita: total 4 512 USD (9,2 % GDP); government /compulsory spending: 3 872 USD (86 % of total)[8]

Czechia possesses **solid HWF data foundations, but lacks coordinated governance, continuous analysis, planning tools, and strategic leadership**. Without a clear long-term vision and responsible entity, HWF planning remains fragmented, reactive, and largely ineffective.

National HWF Planning System before HEROES

Health workforce (HWF) planning in Czechia involves several institutions, though none currently has a formal coordinating role. The core data actor is the Institute of Health Information and Statistics of the Czech Republic (IHIS), which administers the National Health Information System (NHIS) and its key registries, including the National Registry of Reimbursed Health Services, the National Registry of Healthcare Providers, and the National Registry of Healthcare Professionals. Additional actors include the Ministry of Health, which sets strategic direction, and other public bodies maintaining external registers such as the Population Registry and the Register of Higher Education Students. Professional chambers, health insurance companies, hospital associations, and regional authorities also produce or hold relevant data and analyses, but their involvement in HWF planning is informal, fragmented, and not legally integrated. The activities carried out in this area up until 2023 were mostly implemented by IHIS on the basis of ad hoc assignments from the Ministry of Health. Other entities were involved only exceptionally. These activities consisted of analysing data routinely collected by IHIS, as well as data from sources that are not normally available in the registers of the National Health Information System. For example, in 2019, when the Government of the Czech Republic decided to increase the enrolment capacity for medical degree programmes at universities, data from the Ministry of Education, Youth and Sports were used for the initial analyses. However, it cannot be said that this ministry has been consistently involved in activities related to HWF planning.

At present, responsibilities for HWF planning are diffuse and largely undefined. IHIS is responsible for collecting and maintaining HWF-related data, while the Ministry of Health oversees health policy and strategic documents such as Health 2030, which acknowledges the need for workforce stabilization but does not define measurable targets or assign clear accountability. No institution is formally responsible for long-term, systemic HWF planning, modelling, or forecasting. Analyses and projections are occasionally produced by IHIS, professional chambers, associations, or regional authorities, typically focused on individual professions and without coordination or follow-up.

For the Czech Republic, participation in JA HEROES is the first involvement in a similar project as a full consortium member. This fact is also reflected in the Czech Republic's activities in this area to date.

The current HWF planning process in Czechia is largely ad hoc and reactive. Although the country has a relatively robust data infrastructure, data are rarely analysed on a continuous basis, and significant gaps remain, including information on health workforce mobility, inactivity, retirements, and actual hours worked. Existing datasets are insufficiently linked and validated, and the results of analyses seldom inform policy decisions. Health Workforce Planning tools and models are not systematically used at either national or regional level. In most cases, the planning process worked in such a way that, based on a specific event or in response to media pressure or public demands, the Ministry of Health tasked IHIS with analysing the staffing situation in the affected care sector (e.g., primary paediatric care). The outcome was a detailed assessment of the available (and relatively robust) data, which either disproved or confirmed information regarding the availability of care. Only in exceptional cases was this followed by a proposal of measures aimed at improving the situation. Frequently, the Ministry referred only to activities that were carried out regardless of the analytical findings.

A proposed institutional model based on HEROES outcomes foresees the creation of a dedicated HRH planning unit composed of a data unit, an analytical unit, and a political/executive unit. Under the proposed model, responsibilities would be clearly divided: (1) the data unit would ensure data quality, linkage, and availability, (2) the analytical unit would conduct workforce analyses, modelling, and forecasts, and (3) the political/executive unit would translate evidence into policies, coordinate stakeholders, and oversee implementation and evaluation. A positive development is the launch in 2026 of the Administration System for Healthcare Education, which aims to improve data validation, provide better insight into workforce inflows, and support long-term forecasting. If combined with the proposed institutional framework and appropriate analytical and policy-making skills, this could enable a structured, evidence-based HWF planning process in the future.

HEROES: Key Achievements

- **2025: Putting the topic of workforce planning on the agenda of the Ministry of Health and stakeholders**
In 2025, the Ministry of Health of the Czech Republic hosted a delegation from the World Health Organization (WHO) that carried out an intensive mission focused on analysing the health labour market and workforce planning. This mission brought together WHO experts and key Czech healthcare stakeholders and was also the first round of the Policy Dialogues run within the Joint Action, following the Stakeholder Analysis carried out within HEROES. It was the first time when the Ministry of Health officially opened a dialogue on the HWF topic with various stakeholders and called for cooperation in solving the problem.

The main outcome of the sessions is that there is an evident demand for coordinated and continuous HWF planning at the national level. The stakeholders, such as an association of Young doctors, the National Institute of Public Health, the Association of University Educators of Non-Medical Health Professions in the Czech Republic (and many more) want to actively participate in policy making. Some stakeholders, for example the above-mentioned Young Doctors, or the Czech Medical Chamber carry out their own research and polls and can be valuable sources of qualitative data and help identify grey areas and data gaps.

HEROES gathered the key stakeholders to brainstorm on institutionalisation of health workforce planning: senior officials from the Ministry whose agendas are affected by HRH planning (for example, the Director of the Department of Directly Managed Organisations, the Director of the Pricing and Reimbursement Department, the Director of the Public Health Department, and a representative of the Health Insurance Supervision Department), as well as staff from the Ministry's directly managed organisations, such as the National Institute of Public Health. Their brainstorming resulted in the first draft of the possible health workforce planning process and detailed stakeholder analysis.

The Policy Dialogues are ongoing in various formats with different groups of stakeholders.

- **Creating a foundation for linking data collection (IHIS) with data analysis** especially from a demographic perspective, i.e. cooperation between IHIS and the Faculty of Science, Charles University, the Department of Demography and Geodemography, as a member of the HEROES team serving as a basis for further, more formal collaboration and a precursor of what could evolve into a dedicated team in the future.

Participation in HEROES fostered collaboration between the IHIS and the research experts from the Department of Demography and Geodemography of the Faculty of Science, Charles University and for the first time it brought together in one team both specialists in data collection and analysis and experts in demographic forecasting. The data collected and evaluated by the IHIS was used in the next steps to define datasets needed for prediction and planning of HWF. The cooperation, which took place within the project on a rather informal basis built the basis for the creation of a permanent expert team.

- **Proposing a planning process, including stakeholders involvement.**
The proposed planning process consists of four steps: (1) data collection and analysis by IHIS, (2) preparation and consultation of reports with stakeholders, (3) government-level approval of measures, and (4) systematic evaluation. The model emphasises use of existing data, coordinated stakeholder involvement, evidence-based decision-making, and continuous monitoring and adjustment of workforce policies. In 2025, the process was presented to stakeholders with positive feedback.

- **Establishing international cooperation between the Ministry of Health and foreign partners**

In addition to the intensive cooperation with the World Health Organization and WHO Europe, the project successfully facilitated the exchange of experience with partners from Slovakia and the Netherlands, with particular learning opportunities provided by NIVEL. These international interactions strengthened mutual learning, enabled the transfer of good practices in health and care workforce planning, and supported the development of sustainable professional networks between key institutions involved in strategic workforce policy.

- **Creating datasets for the National Health Information Portal (NHIP, nzip.cz).**

The Ministry of Health has defined (based, among other things, on core medical training branches) approximately 20 key areas of healthcare services both medical and non-medical that are receiving primary focus. These areas encompass different types of outpatient care (down to the level of individual specialties) as well as inpatient care (categorized by type: acute, intensive, and long-term/aftercare). For each investigated area, up to 14 data sets with clearly defined data interfaces can be established, containing data on both the provision and the supply of health services. The objective is to make these data sets accessible to the general public as open data via the National Health Information Portal (NHIP) and to develop visualizations in the form of Power BI reports[9]. Reports preview in the annex 1.

- **Mapping the movement of nurses and midwives within the health care system**

In late 2025, a questionnaire “Movement of Nurses within the Healthcare System and Work-Life Balance” was conducted as a secondary project activity mapping the situation in the non-medical WHF sector by the Charles University and distributed in collaboration with NCONZO, gathering 990 responses from nursing professionals. The survey aims to understand the career movements and interest of nurses to improve Health Workforce (HWF) planning. Preliminary results show that most respondents experienced at least one career transition, while 45% remained in their original jobs. Additionally, 16% reported that professional factors (primarily high workload and financial constraints) limited their desired family size. These data provide an initial descriptive overview. Further analysis will be conducted in 2026.

- **Initiation of educational activities in health workforce planning**

Czechia initiated educational activities in health workforce planning through a national training session titled Introduction to Personnel Capacity Planning in Healthcare in the Czech Republic, hosted by the Ministry of Health of the Czech Republic in October 2025. The event brought together representatives of the Ministry and key national stakeholders and focused on health workforce- governance, data sources, and international best practices, marking an important first step toward systematic capacity building in health workforce planning. Follow-up training activities are planned for the 30th of June to provide more in-depth learning on specific components of healthcare workforce planning. This time the whole training event will focus on approaches to planning and staffing standards in psychiatric care.

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

One of the key lessons from the development of the concept of health workforce planning in Czechia was that the initial uncertainty surrounding the project's direction was inevitable and ultimately valuable. At the outset, it was not clear whether the main added value would lie in improving data, developing analytical models, or formulating policy recommendations. Over time, however, it became clear that while institutions such as the Charles University and the Institute of Health Information and Statistics (IHIS) can produce and discuss high-quality data and analyses, the Ministry of Health lacks a dedicated structure that would enable the systematic use of this knowledge for decision-making. The core challenge was therefore not technical, but institutional and governance-related.

A key lesson was that data and analyses alone do not lead to effective planning or policy change. Even in a context where relatively robust data sources exist, their impact remains limited unless there is a clearly defined process, ownership, and responsibility for transforming evidence into action. This led to a shift in focus from purely analytical outputs towards the design of an institutional framework, including the proposal of a dedicated human resources unit and a structured planning process. Creating environment within the Ministry of Health for evidence-based planning emerged as a prerequisite for any meaningful HWF strategy.

Another important lesson concerned the role of political support and governance. Sustainable HWF planning requires not only expert input but also political backing at senior levels. Without clear anchoring in national strategies and decision-making, even well-designed planning tools risk remaining unused. The WHO mission played a critical role in legitimising the topic, opening discussions within the Ministry of Health, and strengthening the case for institutional change. International endorsement helped shift the debate from isolated technical discussions to a broader policy conversation.

Finally, the process highlighted the importance of active stakeholder engagement. HWF planning touches a wide range of actors with differing interests and responsibilities. Rather than treating stakeholders as passive consultees, the project demonstrated the need to actively mobilise them, integrate their perspectives, and create mechanisms for continuous dialogue. This approach not only improves the quality and relevance of proposed measures but also increases the likelihood of their implementation.

Overall, the main lesson learned is that effective HWF planning is less about developing sophisticated models and more about building governance structures, processes, and political commitment that allow existing knowledge to be used consistently and strategically.

Thanks to this mind shift, it was possible during January 2026, to bring together all the staff at the Ministry of Health who, in one way or another, deal with HWF planning issues or whose agendas are affected by this topic (for example, in the preparation of legislation, in setting reimbursement policies, etc.). Before, these ministry teams did not know each other's objectives, did not cooperate, and did not exchange information. Since February, experts from these teams have been meeting regularly, aiming to coordinate their activities, make use of each other's outputs, and create a foundation for formal HRH governance at the ministry.

Country level report based on the Sustainable Workforce Intelligence Planning Systems Framework

Domain 1: Political and contextual support

The Czech health system represents a hybrid model in which public and private providers coexist within a predominantly publicly financed framework[10]. Most healthcare services are funded through mandatory public health insurance, which formally operates as an insurance scheme but in practice functions similarly to a tax. Health insurance funds are in competition, yet they operate under uniform rules and benefit packages defined at the national level. Providers, regardless of ownership, are largely dependent on contracts with these insurers, while a smaller share of care is financed through direct payments by patients. This hybrid financing and provision structure creates a complex environment for workforce planning, as market mechanisms coexist with strong regulatory and redistributive elements.

Governance of the healthcare delivery network is similarly fragmented. At the national level, the Ministry of Health oversees the overall organisation of care and regulatory framework, together with health insurance funds that influence service availability through contracting and reimbursement policies. At the same time, regions play a significant role. They grant authorisations to provide healthcare services and are themselves major providers through regionally owned hospitals and facilities. As a result, decisions affecting staffing levels, skill mix, and working conditions are made across multiple layers of governance and by actors with differing incentives and responsibilities. Health workforce issues therefore cannot be addressed solely through central regulation or isolated sectoral measures.

This institutional diversity means that many stakeholders have both the interest and the capacity to influence health workforce availability, often from competing perspectives. Providers focus on operational feasibility, insurers on cost control and network adequacy, regions on territorial access, and the state on system sustainability and equity. Effective HWF planning in this context requires mechanisms that enable consensus-building and compromise rather than top-down solutions. Without a shared framework, coordinated data, and an agreed planning process, individual actions risk pulling the system in divergent directions. The experience in Czechia underlines that successful HWF planning must be embedded in governance arrangements that acknowledge this plurality of actors and actively manage their interactions.

Domain 2: Human Resources for Health (HRH) governance

Stakeholder landscape: roles, power, and interests in HWF Planning

One of the very first activities carried out within the Joint Action was creating a stakeholder matrix: **Original stakeholder matrix is in annex 2.**

In Czechia 32 main stakeholders who can be grouped into seven following clusters regarding their role and relation to HWF process we identified: professional chambers, insurance companies and their associations, in-patient care providers, primary care providers, educators, professional/expert societies, regional governments and municipalities.

Following table shows the simplified stakeholders matrix. The full version is in the Annex 2.

Name of stakeholder (grouped)	Type of stakeholder	Involvement	DATA		PROCESS		SKILLS	
			I	P	I	P	I	P
Professional chambers	Health Professional Order	Not yet involved	H	H	H	H	H	L
Insurance companies and their associations	Social Insurance Fund / Company	Not yet involved	H	H	H	H	H	H
In-patient care providers and their associations	Health Professional Order	Not yet involved	H	H	H	L	H	L
Asociace děkanů lékařských fakult ČR (The Association of Deans of the Medical faculties of the Czech Republic)	Academia	Not yet involved	L	H	H	L	L	L
Regions/municipalities and their associations	Local / Regional Authority	Not yet involved	L	L	H	L	H	L
Primary care providers and their associations	Society	Not yet involved	H	H	H	H	H	H
Institut postgraduálního vzdělávání ve zdravotnictví (The Institute for Postgraduate Medical Education)	Governmental Agency	Not yet involved	H	H	H	H	H	H
Česká lékařská společnost Jana Evangelisty Purkyně (Czech Medical Association of J. E. Purkyně)	Health Professional Order	Not yet involved	L	L	H	L	H	L
Asociace vysokoškolských vzdělavatelů nelékařských zdravotnických profesí v ČR (AVVNZP) (Association of University Educators of Non-Medical Health Professions in the Czech Republic)	Academia	Not yet involved	L	L	L	L	L	L
Ministerstvo práce a sociálních věcí (MPSV) (Ministry of Labour and Social Affairs)	Ministry	Not yet involved	L	L	L	L	L	L
Česká asociace sester (Czech Association of Nurses)	Health Professional Order	Not yet involved	H	L	H	L	L	L
Mladí lékaři, z.s. (Young Doctors)	Health Professional Order	Not yet involved	H	L	H	H	H	L

However, as the project progressed and (especially after the first round of the policy dialogues) it was obvious that the approach to the stakeholders has to be more structured. That is why another stakeholder analysis was built on the basis of the original mapping conducted in 2023. Core public institutions involved in JA HEROES implementation (Ministry of Health, IHIS, National Centre for Nursing and Non-Medical Professions, further also NCONZO) were excluded from the stakeholder list to avoid duplication. The new mapping and deeper analyses of identified stakeholders is in the annex 3.

Domain 3: HWF planners' capabilities

Concerning the skills required of HRH planners, the objective is to build capacity both within the Ministry of Health and among key stakeholders involved in HWF planning.

Within the Ministry of Health, the required skills are identified as necessary for planners working in the HRH Unit as well as for experts and staff from collaborating units across the Ministry. The planned HRH Unit requires a clearly defined set of professional skills aligned with the needs of systematic, data-driven health workforce planning in the Czech Republic. Key data-related skills include working with large administrative and registry datasets, data cleaning, analysis, and interpretation, and close cooperation with national data institutions. Modelling skills are essential, particularly the ability to develop, use, and interpret predictive and scenario-based workforce models, including the use of specialised tools and software to assess future supply, demand, and training capacity needs.

In addition to technical competencies, policy and governance skills are required, including strategic planning, health workforce policy design, and the ability to translate analytical and modelling outputs into concrete policy recommendations, regulatory measures, and decisions on education and financing. Strong stakeholder management and communication skills are also critical, covering intersectoral coordination, facilitation of advisory and expert groups, cooperation with educational institutions and professional bodies, and engagement with international partners. Legal and health economics expertise further supports understanding regulatory frameworks, financing mechanisms, and incentive structures. Together, these skills form the core knowledge base required for the effective functioning of the HRH Unit.

From plan to training activities, skills and competency gains during HEROES

Under HEROES, the Czech team prepared educational content common so far for all the stakeholder groups. The session under the title Introduction to Personnel Capacity Planning in Healthcare in the Czech Republic took place in Prague on October 16, 2025. The training event was hosted by the Ministry of Health of the Czech Republic.

25 people were present in person and 2 people participated online in the training session. The number was higher than planned.

Roughly one third of the audience was formed by representatives of the Ministry of Health. Other two thirds were formed by representatives of various stakeholders, such as Institute of Clinical and Experimental Medicine, Faculty of Medicine of Charles University, Institute for Postgraduate Medical Education, Chamber of Rescuers of the Czech Republic's Emergency Medical Services, Faculty of Science of Charles University, Young Doctors Association, Institute of Health Information and Statistics of the Czech Republic, National Institute of Public Health and General Health Insurance Company of the Czech Republic. Most of the above-mentioned stakeholders operate at national level.

The training session focused on the following topics: (1) organization and management of healthcare in the Czech Republic with an emphasis on personnel issues, (2) available data sources and their content, general structure of the data, what purpose data could be used for, and (3) healthcare workforce planning presenting best practice examples from abroad and the current situation in the Czech Republic.

The mix of participants, i.e. both representatives of the ministry and stakeholders from various areas, proved to be beneficial. The feedback was positive. The stakeholders were genuinely interested in being involved in the HWF planning process discussion and all related activities.

During HEROES, several online meetings were held between Czech (represented by Charles University) and Slovak (Ministry of Health) representatives within the JA HEROES initiative. Due to their shared history (having been a single state until the end of 1992), Czechia and Slovakia have much in common, and many of their healthcare policies and data collection systems remain similar. The primary objective of these meetings was the exchange of experience in data collection and analysis, as well as consultation on the construction of the HWF forecasting model. These meetings proved mutually beneficial, and it can be expected that future knowledge sharing will continue to foster the positive development of HWF planning processes in both countries.

An important milestone in strengthening Czech team capacities was a mutual learning visit to NIVEL. During this two-day mutual learning visit in November 2025, the Czech delegation gained practical insight into how HWF planning is systematically organised and embedded in health policy decision-making in the Netherlands. Participants became familiar with the structure and key assumptions of the Nivel model, including how data on population needs, service utilisation, and workforce supply are integrated to anticipate future healthcare demands.

Through expert meetings and Policy Dialogues with Dutch stakeholders, including National Institute for Public Health and the Environment, Ministry of Health, and the Advisory Committee for Medical Manpower Planning, the Czech delegation gained a detailed understanding of governance arrangements in health workforce planning. This included insights into the key stakeholders and institutions involved, their roles and mandates, the relationships and coordination mechanisms between them, as well as the financing arrangements supporting workforce planning and implementation. The discussions illustrated how modelling outputs are translated into concrete policy recommendations and training capacity decisions, using elderly care and the role of informal caregivers as a practical example. These learning activities have contributed to further refine the proposed process and governance model for health workforce planning in Czechia.

A piloting model and a discussion of its outputs took place on 30 June in Brno, bringing together representatives of the Ministry of Health, Charles University, the Institute of Health Information and Statistics of the Czech Republic, and professional psychiatric associations.

During the first part of the day, the HWF forecasting model was presented across the full spectrum of psychiatric specialties. Separate forecasts were developed for outpatient care, acute inpatient care, and long-term inpatient care, with each type of care further differentiated between medical and non-medical healthcare professionals.

The second part of the day consisted of a discussion moderated by representatives of the World Health Organization (WHO). Psychiatry was selected for this pilot for two main reasons. First, it is currently a highly prioritized field within the healthcare system due to the ongoing psychiatric care reform launched in 2012. Second, professional psychiatric associations are in the process of developing a new concept of psychiatric care delivery. The exercise therefore provided a valuable opportunity to demonstrate how these two initiatives influence one another. Specifically, it showed how data and projections generated by the HWF forecasting model can inform the planned future model of care, and conversely, how the model itself can be further refined to better reflect the needs and expectations of healthcare professionals and service providers. The event was evaluated very positively, and the professional associations expressed a strong interest in continuing this form of collaboration in the future. Using data that will be in the formats proposed by IHIS and the Faculty of Science, Charles University, the Department of Demography and Geodemography), and with the help of the model proposed by the Charles University, we will aim to develop a proposal for predicting workforce needs in the selected specialties.

Subsequently, the projections will be validated in collaboration with key stakeholders, (representatives of professions used in the models, chambers, educators, insurers, providers). Building on this validation process, the stakeholders will work together to identify and develop necessary measures at all levels. The exercise is intended to mirror a real-world policy process, progressing from discussion and consultation through negotiation and consensus-building, with the aim of producing a set of agreed recommendations that could ultimately be submitted to the government for consideration. All these activities will be carried out under the supervision of the WHO experts. Approximately 14 days after the completion of the workshop, an online meeting debriefing and analysis of errors/good practices from the WHO perspective will take place focusing on the discussion on possible adjustment of the proposed measures. This activity should still be implemented within the JA HEROES timeframe, most likely in July.

Domain 4: HWF data and models

HWF Data: Sources

The main sources of health workforce (HWF) data in Czechia are the National Health Information System (NHIS), which is managed by the Institute of Health Information and Statistics of the Czech Republic (IHIS), a government agency under the Ministry of Health. Key NHIS registries relevant to HWF include the National Registry of Reimbursed Health Services, which tracks staffing at health service providers and insurers and includes the sex and age of healthcare workers (updated quarterly since 2023). (1) The National Registry of Healthcare Providers, which registers entities authorized to provide healthcare and social services and (2) the National Registry of Healthcare Professionals, the core HWF registry that captures professional qualifications, employment, capacities, specialization and education, employer details, foreign professionals' legal status, and disciplinary actions. This registry is linked to the Population Registry for death and migration data but does not track mobility, inactivity, or retirement. In addition, the Records of Healthcare Professionals, administered by the Ministry of Health and the Institute for Postgraduate Medical Education, contain specialist training data, although these are incomplete, not validated, and not linked to NHIS or the Population Registry. NHIS also collects other data, including annual reports on salaries, staffing, operational equipment, employer data, and workforce numbers. (3) The Population Registry, maintained outside the Ministry of Health, tracks all residents, including citizens, EU nationals, foreigners with residence permits, and asylum or subsidiary protection holders, providing demographic context for HWF data. (4) The Register of Higher Education Students, maintained by education providers and the Ministry of Education, Youth and Sports, includes enrollment and graduation data for medical bachelor's, master's, and doctoral programs and is useful for estimating HWF inflow from education. Auxiliary or potential data sources, which are not legally mandated but can complement NHIS, include (5) professional chamber registers (Czech Medical, Stomatology, and Pharmacists Chambers) that track active membership, training, and mobility, (6) health insurance data from the General Health Insurance Company, (7) the Association of Health Insurance Companies, and (8) the Health Insurance Bureau, which provide information on service demand and regional care distribution, (9) hospital associations (Association of Hospitals of the Czech Republic, Association of Czech and Moravian Hospitals) that supply regional care demand and provider capacity data and (10) professional societies, such as the Czech Medical Association of J. E. Purkyně, which forecast specialization trends and anticipate developments in healthcare services.

Advanced Minimum Data Set: achievements under HEROES

The Advanced Minimum Dataset proved to be a suitable tool that helped refine the core data frameworks required for HWF planning. In February 2026 the Advanced Minimum Dataset was revised and the current situation is following:

Advanced Minimum Dataset – February 2026

Please consider the planning goals - LEVEL 2b - Demand-based approach, Monitoring changes, Assessing the current situation, Inventory of future imbalances in demand of health services

Please mark each marked cell "X" with the following codes

Data available and used for planning	We filled this from the perspective of the data, that is from the perspective of their existence, availability and possibility to be used.
Data available but not used for planning	We did not take into account if or how the data are used in real life.
Data not available but needed for planning	Some planning measures are taken and data are analysed for these purposes; however, only ad hoc and on a request, and not as a systematic or systemic long term activity.
Data available but needs improvement	
Y= data are also available and are used for planning	

Quantitative data set	Supply side					Demand side	
	Labour force	Training	Retirement	Outflow migration	Inflow migration	Population	Health consumption
Profession	X	X			Y		
Age	X	Y			Y	X	X
Head count	X	X			Y	X	X
FTE	Y						
Geographical area	X	X			Y	X	X
Specialisation	X	X					
Country of first qualification	Y	Y			Y		
Gender	X	Y			Y	Y	Y

Qualitative data set	
	Care organisation
Teamwork	X
Task shifting and skill-mix	X
Reconfiguring health services including digital	X
	Health Indicators
Mortality and morbidity of HWF	X
Mental health and well-being of HWF	X
HWF equity	X
	Labour market
Financial investment, economical background	X
Performance and productivity	X

Based on these foundations, it was also possible to review current and future data source requirements and define the interfaces for the essential "national" datasets needed to analyze past trends and plan the future number, capacity, and structure of the healthcare workforce (see further below under “Data Source Enhancement and Integration”).

Another important achievement was to map the current data sources and indicate their weaknesses and strengths.

Personnel data by administrative healthcare data sources

NRHP	NRRHS	Annual Statistical Reports
Pros: • Person-level data • Demographics and education • Coverage beyond public insurance • Longitudinal data (since 2018) Cons: • Incomplete FTE reporting • Missing specialty/workplace detail • Out-of-date employment status	Pros: • Very high completeness • Person-level and FTE data • Quarterly updates • Workplace specialty info Cons: • Reliable only fully since 2023 • Only contracted providers • Identifier inconsistencies • Insurer methodological differences	Pros: • Long time series (since 2010) • Near-complete inpatient coverage • Detailed pay, hours, and staff structure • Care-segment breakdowns Cons: • Mostly aggregated data • Weaker outpatient coverage • Duplication at person level • Annual updates with long delay

NRHP - National Registry of Healthcare Professionals

NRRHS - National Registry of Reimbursed Health Service

Education and training data sources

MoE statistics	EZP MoH outputs
Pros: • Long historical series • National coverage • Detailed student and graduate counts • Regional and programme detail Cons: • Aggregated only • No linkage to workforce databases • Annual updates with delay	Pros: • Individual-level training data • Detailed specialisation and practice info • Continuously updated • Linkable to MoH databases Cons: • No FTE data • Limited programme coverage • No standardised statistical export

MoE Ministry of Education

EZP MoH - Records of Healthcare Professionals

Workforce coverage by professional group (at a glance)

Profession	NRHP	NRRHS	Annual Statistical Reports
Doctors	Good identification incl. qualifications, Limits with multiple specialisations	Specialty inferred from contracts, Education categories inconsistent	FTEs available, No specialty detail
Dentists	Identifiable but misclassification risk	Similar to doctors, Education inconsistencies	FTEs available, Misclassification possible
Pharmacists	Clearly identifiable	Not covered	FTEs available
Non-medical healthcare staff	Detailed legal categorisation	Only broad groups; misclassification	Detailed categories with FTEs
Non-healthcare staff	Not covered	Not covered	Covered (aggregated)

NRHP - National Registry of Healthcare Professionals

NRRHS - National Registry of Reimbursed Health Service

HWF Data: improvements

Data Source Enhancement and Integration

The enhancement of data sources was a cornerstone of the activities conducted during HEROES. Based on detailed work and regular consultations between representatives of the Institute of Health Information and Statistics and Faculty of Science, Charles University, the Department of Demography and Geodemography, the methodology for processing data from the National Registry of Reimbursed Health Services (NRRHS) and its interconnectivity with the National Registry of Healthcare Professionals (NRHP) was refined.

Subsequently, a data interface was defined for 14 distinct data sets that can be generated for each of the 20 key healthcare areas identified by the Ministry of Health. The scope of monitoring includes:

- Primary Care: Demand side (number of registered insured persons by age and sex).
- Outpatient Care: Detailed by individual specialties (number of contacts and unique patients by age and sex).
- Inpatient Care: Categorized by type (acute, intensive, long-term/aftercare) down to specific specialties (number of bed-days by patient age and sex, number of beds).
- Health Workforce Supply: For all areas, data includes the number and capacity of workers by age and sex.

These datasets provide granular information down to the level of anonymized healthcare providers (including region at the MEP level (Municipalities with Extended Powers) and municipality size category and individual workers (age, sex, capacity/FTE). Data are available in both detailed formats and aggregated levels (NUTS 3 regions and national totals). These datasets also serve as primary inputs for visualizing structural trends via Power BI reports.

A unique feature of the personnel datasets is the linkage between NRRHS and NRHP, allowing for the identification of potential "personnel reserves" (based on completed board certifications). This enables data filtering based on activity within the system:

1. Active within the specialty (based on contractual care provision).
2. Active outside the specialty.
3. Active elsewhere (according to provider data in NRHP).
4. Inactive for unknown reasons.

HWF Data: HEROES contributions and future directions

These data foundations represent ideal inputs for both analytical purposes and the estimation of future HWF needs. The data, along with visualization reports, will be made available as open data on the National Health Information Portal.

HWF Planning Models: design, application and HEROES contribution to HWF Planning Models

At the start of HEROES, Czechia lacked a systematic approach to HWF planning. No standardized model existed for this purpose, and estimates were created only on an ad-hoc basis. The HEROES project facilitated a fundamental shift in this area.

During the project, Faculty of Science, Charles University, the Department of Demography and Geodemography, with support from IHIS, developed a projection model that was first publicly presented in Autumn 2025 (including a peer-review session with NIVEL experts in November 2025). The model is designed for the national level, though it theoretically allows for regional analysis, which remains a goal for future development post-HEROES.

Key methodological features of the model:

- **Universality:** It is applicable to various categories of workers (e.g., physicians vs. nurses) and different segments of care.
- **Demographic Forecasting Principles:** Based on data from the last ten available calendar years, the supply side analyzes sex-age structures, system entry rates, and exit intensities. Demographic curve-smoothing methods are applied to exit data to minimize random fluctuations.
- **Capacity Analysis (FTE based adjustments):** The model tracks average workloads (FTE) by age and sex.
- **Demand Side Analysis:** Utilization data is analyzed by age and sex of the patient (registrations for primary care, contacts for outpatient care, and bed-days for inpatient care).

By analyzing trends in supply and demand, the model forecasts future HWF needs. On the basis of the feedback from individual providers, a benchmarking system was created to relate production data (registrations, contacts, bed-days) to worker capacity, determining "production per 1 FTE". This benchmarking allows for the calculation of median and percentile values to define an "optimal capacity" interval. Testing identified the 4th and 6th deciles[11] as the most suitable thresholds, defining the typical workload of the middle 20% of providers. These boundary values serve as simulations for low, medium, and high forecast variants, estimating the annual recruitment needs required to maintain these ratios.

The model's projections extend to the year 2060 and are designed for continuous updates. Future demand estimates are driven by official population projections from the Czech Statistical Office (CZSO) covering the same period.

Due to current data limitations regarding HWF migration, the model does not yet distinguish between specific types of entries and exits (e.g., graduates vs. foreign migration). However, the framework allows for this integration as data quality improves. For now, these structural nuances are addressed in follow-up analyses using data from educational institutions and professional chambers.

HWF Planning Models: HEROES contribution and future directions

Initial feedback from NIVEL was highly positive, particularly praising the application of a high-detail demographic approach focused on the worker/patient level. Future steps include:

- **Validation** within the Czech environment on the basis of presentations to health insurance companies and other stakeholders.
- **Expansion** to the regional level and integration of GIS tools[12].
- **Public Access:** Once approved by stakeholders (representatives of professional associations), key results and Power BI visualizations will be made available to the general public via the National Health Information Portal.

The model, including its basic functionality, is still being tested without yet being part of a planning process that would take into account other aspects such as quality-of-care standards, developments in knowledge, or public expectations. Before the completion of the JA HEROES a more comprehensive testing to simulate a future planning process in the area of psychiatric care will take place. This includes the assessment of the model and the possible application of its outputs in the context of the entire care system and other decision-making processes, including feedback from care providers, medical experts, as well as the impacts on legislation and healthcare financing (i.e., the effects on the health insurance system).

A fully fledged evaluation, however, will only be possible once the model becomes an integral part of the regular planning process and is used in practice.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

The Sustainability Plan for HEROES outlines key achievements and actions to ensure continuation of work and the long-term improvement of health workforce (HWF) planning. Key accomplishments include the creation and approval of an HWF planning process at the Ministry of Health, establishing a dedicated planning unit, establishment of a network of stakeholders and experts, and development of data interfaces for analysis and projections.

Planned actions focus on four domains: (1) political support, (2) governance, (3) planner capabilities, and (4) data/models. Political sustainability includes presenting the draft HWF process to new ministry management by late 2025 and continuing policy dialogues at governmental and stakeholder levels through 2026–2027 to secure mandates and foster engagement. Governance actions aim to formalize a permanent HR unit within the Ministry of Health by January 2027, ensuring institutional responsibility and stable funding.

Capacity building for HWF planners involves organizing training sessions with WHO support, and participation in leadership programs such as NHS/WHO Working for Health 2030 and Rosalind Franklin Leadership Programme by 2026 to strengthen cross-sectoral cooperation and leadership skills.

Data and modelling actions include completing datasets for healthcare services, developing visualization tools and reports in Power BI, and making them publicly accessible by the end of 2026. These efforts will provide the analytical foundation to model future workforce needs, support evidence-based decision-making, and ensure the sustainability of HCWF planning in Czechia.

ANNEX 1:EXAMPLES OF THE VISUALIZATION TOOLS AND REPORTS IN POWER BI
ANNEX 2: STAKEHOLDER MATRIX 2023

	Name of stakeholder	Type of stakeholder	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
				I	P	I	P	I	P
1	Česká lékařská komora (Czech Medical Chamber)	Health Professional Order	Not yet involved	H	H	H	H	H	L
2	Česká stomatologická komora (Czech Dental Chamber)	Health Professional Order	Not yet involved	H	H	H	H	H	L
3	Česká lékárnická komora (Czech Chamber of Pharmacists)	Health Professional Order	Not yet involved	H	H	H	L	H	L
4	Všeobecná zdravotní pojišťovna ČR (General Health Insurance Company of the Czech Republic)	Social Insurance Fund / Company	Not yet involved	H	H	H	H	H	H
5	Svaz zdravotních pojišťoven ČR (Association of Health Insurance Companies of the Czech Republic)	Social Insurance Fund / Company	Not yet involved	H	H	H	H	H	L
6	Asociace nemocnic ČR (Association of Hospitals of the Czech Republic)	Health Professional Order	Not yet involved	H	H	H	L	H	L
9	Asociace krajů ČR (Association of Regions of the Czech Republic)	Local / Regional Authority	Not yet involved	L	L	H	L	H	L
10	Svaz měst a obcí (The Union of Towns and Municipalities of the Czech Republic)	Local / Regional Authority	Not yet involved	L	L	H	L	H	L
11	Sdružení praktických lékařů pro děti a dorost (Association of General Practitioners for Children and Adolescents)	Society	Not yet involved	H	H	H	H	H	H
12	Sdružení praktických lékařů ČR (Association of General Practitioners of the Czech Republic)	Society	Not yet involved	H	H	H	H	H	H
13	Institut postgraduálního vzdělávání ve zdravotnictví (The Institute for Postgraduate Medical Education)	Governmental Agency	Not yet involved	H	H	H	H	H	H
14	Kancelář zdravotního pojištění (Health Insurance Bureau)	Social Insurance Fund / Company	Already involved	H	H	H	H	H	H
15	Česká lékařská společnost Jana Evangelisty Purkyně (Czech Medical Association of J. E. Purkyně)	Health Professional Order	Not yet involved	L	L	H	L	H	L

	Name of stakeholder	Type of stakeholder	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
				I	P	I	P	I	P
18	Ministerstvo práce a sociálních věcí (MPSV) (Ministry of Labour and Social Affairs)	Ministry	Not yet involved	L	L	L	L	L	L
19	Česká asociace sester (Czech Association of Nurses)	Health Professional Order	Not yet involved	H	L	H	L	L	L
20	Unie porodních asistentek (UNIPA) (Union of Midwives)	Health Professional Order	Not yet involved	H	L	H	L	L	L
21	Česká komora porodních asistentek (ČKPA) (Czech Chamber of Midwives)	Health Professional Order	Not yet involved	H	L	H	L	L	L
22	Česká společnost porodních asistentek (ČSPA) (Czech Society of Midwives)	Health Professional Order	Not yet involved	H	L	H	L	L	L
23	Komora záchranářů zdravotnických záchranných služeb České republiky (Chamber of Emergency Medical Services of the Czech Republic)	Health Professional Order	Not yet involved	H	L	H	L	L	L
24	Společnost radiologických asistentů ČR (Society of Radiological Assistants of the Czech Republic)	Health Professional Order	Not yet involved	H	L	H	L	L	L
25	Odborový svaz zdravotnictví a sociální péče ČR	Other	Not yet involved	H	L	H	L	H	L
26	Českomoravská konfederace odborových svazů (Czech-Moravian Confederation of Trade Unions)	Other	Not yet involved	L	L	L	L	L	L
27	Unie fyzioterapeutů ČR (UNIFY ČR)	Health Professional Order	Not yet involved	H	L	H	L	L	L
28	Asociace klinických psychologů ČR (AKP ČR)	Health Professional Order	Not yet involved	H	L	H	L	L	L
29	Association of clinical psychologists								
30	Mladí lékaři, z.s. (Young Doctors)	Health Professional Order	Not yet involved	H	L	H	H	H	L

H	High
L	Low
I	Interest
P	Power

ANNEX 3

In 2023 Czechia identified 32 main stakeholders who can be grouped into seven following clusters regarding their role and relation to HWF process: professional chambers, insurance companies and their associations, in-patient care providers, primary care providers, educators, professional/expert societies, regional governments and municipalities. The complete list is in annex 2.

Despite showing high interest in this topic and often also the will to actively participate in it, almost all of them lack the needed power/competencies to do so, which may be due to their mostly voluntary character. The only entities who evince any level of real power are those whose existence and competencies are formally enacted by law.

This makes us believe that whatever entity should be responsible for HWF planning, it must have a strong political support and be based on legislation along their tasks and responsibilities.

However, as the project progressed and (especially after the first round of the policy dialogues) we learned that our approach to the stakeholders has to be more structured. That is why we made another stakeholder analysis with the following results:

The new stakeholder analysis was built on the basis of the original mapping conducted in 2023 in which 32 stakeholders were identified, including professional chambers, healthcare providers, insurers, educators, regional and municipal authorities, ministries, trade unions, and patient organisations. Core public institutions involved in JA HEROES implementation (Ministry of Health, IHIS, National Centre for Nursing and Non-Medical Professions) were excluded from the stakeholder list to avoid duplication.

In 2025 additional actors were identified, including the Ministries of Education and Finance, public health institutions, employer organisations, patient representatives, and other professional associations which brought the final number of identified stakeholder to 38.

The analytical framework distinguishes three perspectives shaping the health labour market:

1. Supply side (educators and healthcare workers),
2. Demand side (payers, providers, and service users),
3. Cross-cutting influences (regulation, financing, data, and quality assurance).

Each stakeholder was assessed across thematic areas relevant to these perspectives using a 0–4 scoring scale, reflecting their level of activity, system involvement, and ability to influence policy or enforce change. Scores were averaged to determine each stakeholder's relative importance within thematic areas and overall.

Key findings – Supply side

On the education side, the most concerned stakeholders are the Ministry of Education, Youth and Sports, the Association of Deans of Medical Faculties, and the Institute for Postgraduate Medical Education, reflecting their central role in regulating and delivering healthcare education. Professional chambers and primary care associations also play an influential role through accreditation, lifelong learning, and legislative consultation.

Among healthcare workers, professional chambers emerge as the most powerful stakeholders due to mandatory membership and legal recognition. In contrast, non-medical professions are fragmented across multiple associations without statutory authority, significantly weakening their collective influence. A notable exception is the Young Doctors Association, which – despite lacking a formal legal mandate – has become a powerful actor through coordinated action on education, competencies, and working conditions. Notable position has the Czech Association of Nurses, where the discussions on establishment of Chamber of Nurses continues.

Key findings – Demand side

On the payer side, the General Health Insurance Company (VZP) is the dominant stakeholder due to its market share, followed by the Association of Health Insurance Companies and the Ministry of Finance, which plays a crucial role through financing state-insured populations.

On the provider side, the relevant actors are hospital associations and territorial authorities – the Association of Regions and the Union of Towns and Municipalities – reflecting their dual role as founders, owners, and guarantors of care availability. The Public Health Institute and hygiene service (regional public health centres) is also influential due to its regulatory and service-provision functions.

Healthcare service users are primarily represented by umbrella patient organisations and public health institutions, alongside regional and municipal authorities that represent citizens' interests.

Cross-cutting perspective

In cross-cutting areas such as regulation, financing, data, and quality assurance, the most influential stakeholders are the professional chambers, the Ministries of Education and Finance, and the Public Health Institute. Associations representing non-medical professions rank lower, largely due to the absence of legally established chambers and fragmented representation.

Since the Ministry of Health, IHIS, NCONZO as JA HEROES members were not considered for the analysis (only bodies outside of the JA HEROES were following the same methodology as the 2023 mapping), the results are not yet completely accurate and another analysis, this time covering also formerly mentioned institutions, will be carried out.

Stakeholders' involvement in the proposed planning process

1. Data Collection and Initial Analysis

Stakeholders are first involved indirectly through data provision and consultation. The Institute of Health Information and Statistics (IHIS) acts as the Data Group, collecting structured data from national registers such as the National Health Information System (NHIS) and the Health Education Administration System. Additional “soft data” may be provided by external stakeholders to contextualize the situation, highlighting issues such as workforce shortages, migration, or emerging skill needs. This ensures that the National Centre's planning is grounded in both quantitative evidence and stakeholder insight.

2. Consultation and Expert Group Formation

Once the Institute prepares an initial draft report, the National Centre forms an expert group to review the findings. This expert group includes representatives from relevant stakeholders, particularly cross-cutting stakeholders, whose activities affect all areas of healthcare human resources, such as professional chambers, trade unions, educational institutions, and key employer associations.

The group examines the draft report, provides feedback, and proposes measures, including designation of responsible parties and implementation timelines. Beyond the expert group, a broader set of stakeholders is consulted to identify blind spots or risks that might be overlooked. These consultations ensure that the planning process balances multiple perspectives, including supply-side (educators and healthcare workers), demand-side (providers, payers, users), and cross-cutting system influences (policy, regulation, finance, quality assurance).

3. Internal Review and Governmental Approval

Stakeholder engagement continues within the Ministry of Health, where the National Centre submits the report to the Strategic Working Group for Personnel Stabilisation and senior management for internal review. At this stage, all professional departments of the Ministry can comment on the report, ensuring that internal stakeholders' expertise and perspectives are incorporated.

After ministry's approval, the report is submitted to the Government Council for Public Health, which includes representatives from key ministries and central stakeholders. This is a final opportunity for stakeholders to comment before the report is submitted to the government for adoption, task assignment, and monitoring timelines. This step ensures that high-level decision-making integrates stakeholder priorities and aligns responsibilities with systemic capacities.

4. Monitoring and Evaluation

The National Centre remains the focal point for implementation oversight, monitoring the fulfilment of tasks and evaluating the effectiveness of measures. Stakeholders are continuously engaged through feedback on implementation reports, allowing adjustments to be made and ensuring that policies remain responsive to evolving workforce needs. Reports are also shared with the Government Council, maintaining accountability and transparency.

COUNTRY REPORT

ESTONIA



6.3 COUNTRY REPORT: ESTONIA

Introduction

National HWF Planning System before HEROES

This section provides an overview of the state of HWF Planning in Estonia before HEROES started in early 2023. Estonia has a population of approximately 1,373,000 and a healthcare system defined by compulsory solidarity-based health insurance. While life expectancy in Estonia increased at one of the fastest rates in the EU, the healthcare system faced financial challenges, as OOP expenditures exceeded the 15% target set in the National Health Plan. The Ministry of Social Affairs (MSA) and its agencies function as a coordinating body for the system, whereas private providers primarily deliver services. HWF data collection is split between the National Institute for Health Development (NIHD) and the Health Board for supply data, and the Health Insurance Fund (HIF) for demand data.

Before HEROES Estonia's data landscape was characterized by data fragmentation and a lack of linkage between supply-and-demand forecasting, which was weak to begin with. Supply data gathered annually by the NIHD was often undermined by validity issues regarding reporting overtime working hours and the complexities of healthcare workers holding multiple jobs. Furthermore, the Health Care Providers' Information System (HCPIS) lacked data on various medical professions such as physiotherapists and clinical psychologists with no data about either contractual or real working hours. The NIHD also faced legal constraints as it was not a nationally recognized statistics provider, limiting its ability to access individual-level data for tracking emigration or graduate entry into the workforce.

To address these shortcomings, Estonia decided to develop a central forecasting model through the HEROES to replace the fragmented, capacity-based planning processes outlined above. While the country lacked a unified tool, it had strong stakeholder involvement, with various committees and professional associations wielding considerable "soft power" in decision-making. To achieve this "TO BE state", Estonia required specific skills, including the ability to work with fragmented data sets, robust supply and demand data modelling and extensive stakeholder engagement. The lack of a strategic HWF planning framework was also an issue, as was the fact that no Human Resources for Health (HRH) unit existed in either the Ministry of Social Affairs or its agencies.

HEROES: Key Achievements

- **2025: Primary care workforce model**

The model covers the following professions: family doctors, general practitioners, nurses, midwives, physiotherapists, speech therapists, and clinical psychologists. The model covers both supply and demand data, with a more limited scope. The target group for this model consists of the Ministry of Social Affairs and Health Insurance Fund employees, model's methodology was validated with external experts, including stakeholders representing respective professional associations. The model contains robust scenario planning capabilities.

- **2025: Emergency medical services forecasting model**

Due to distinct data management issues and specific end user needs, the model was not incorporated into the main primary care model but launched as a separate “module” for the goal of user simplicity. The target group for this model consists of the Ministry of Social Affairs employees responsible for coordinating emergency medical care in the country. The model's methodology was validated by the Union of Medical Emergency.

- **2026: Healthcare workforce training intake model**

The model covers both specialty doctors trained by the University of Tartu (UT) and other medical professions trained by Tallinn Health University of Applied Sciences (THUAS) and Tartu Applied Health Sciences University (TAHSU). This model has three distinct use cases: annual residency quota planning for specialty doctors (UT), annual training quota planning for other medical professions (THUAS and TAHSU) and a proposal for setting up the four-year admission framework for both THUAS and TAHSU. The target group for this model consists of the Ministry of Social Affairs and Ministry of Education employees and representatives from higher education institutions. Like the primary care model, this model also includes a scenario planner.

- **2025: An HRH team was set up in the Ministry of Social Affairs**

While not operating as a distinct unit, as of writing this report the team has 4.5 FTE with one C-level position, which manages all HWF-related issues across the Ministry of Social Affairs and its agencies. The unit has started to set up the HWF strategic framework, including a draft action plan covering a broad range of HWF activities.

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

Looking back, the project stayed longer than expected in the preparatory as-is and to-be phases. This was partially due to the official project calendar and how the project-level milestones/deliverables were set up, but model building activities should have started at least 6 months before their actual start in December 2024. The Ministry of Social Affairs did not possess relevant knowledge and competencies to build the HWF forecasting model, hence a hiring process was initiated in autumn 2024 to employ an external expert. This delay might have created also an opportunity as the Ministry of Social Affairs ended up with a team member, who has produced excellent results over the last 12-month period. It has also been the experience of the Estonian project team that it is difficult to co-create the model with stakeholders from scratch, much easier to have a draft model ready and then fine-tune it with stakeholders validating both input data methodology and output data.

Input data quality has been the foremost challenge during most of the development cycle as it is uneven across professions – some of the data has been outdated and some has required manual cleaning or cross-referencing different data sets against each other. More importantly - as of this moment there are still gaps in demand data with no clear roadmap towards eliminating the problem. Another crucial challenge is related to target audiences as different users have different use cases for the model. Estonian team found out quite early that they couldn't accommodate them all as one singular model would end up being too complicated and outright cumbersome to use, especially in Excel. Hence, it was decided to make three separate models as outlined above. While this approach brings about its own unique set of problems, the team prioritized usability over maintenance and believes this approach to be the correct one, especially in the context of using Excel. It was also observed that model usage requires a certain level of data literacy and tool proficiency. Training can help to an extent but developing a model that also suits novices and beginners might not be fully feasible. Data analysis and modelling have always been the purview of more advanced users, and it is not foreseen to be changing in the context of the Estonian HWF.

Country level report based on the Sustainable Workforce Intelligence Planning Systems Framework

Domain 1: Political and contextual support

The Estonian health system is based on a mandatory social health insurance model, primarily funded through payroll taxes earmarked for health at the level of 13% of gross wages. This is supplemented by state transfers for non-working groups of the population. The Health Insurance Fund (HIF) pools and manages public funds for health. In 2024, an estimated 94% of the population was covered by social health insurance (Kasekamp et al, 2024). The health system is centralized and overseen by the Ministry of Social Affairs, while municipalities own public hospitals. Inpatient care and most specialist outpatient services are provided in publicly owned hospitals. Family doctors and dentists generally operate as private entrepreneurs; some specialist outpatient and long-term nursing care providers may also be privately owned. Health spending in Estonia remained relatively low compared to the EU average in 2022, both in terms of per capita expenditure (3313 USD per person) and as a share of GDP (6.9%) (Kasekamp et al, 2024).

Public funds accounted for 75% of health expenditure in 2022 (Kasekamp et al, 2024). OOP spending is substantial in Estonia, accounting for 23% of health expenditure in 2022 (Kasekamp et al, 2024). The share of OOP spending on dental care is particularly notable as it is the highest in the EU in 2022. Voluntary health insurance schemes played a comparatively small role, making up 2% of health spending in 2022 (Kasekamp et al, 2024). Additionally, not all possible healthcare services are covered by the health insurance budget; only those listed in the healthcare services catalog and medically indicated for the individual. Although local governments are involved in some public health activities and own some hospitals, their role in the organization and financing of health services remains limited, except for long term care. Health policy planning is guided by the National Health Plan, which sets strategic goals such as increasing life expectancy and reducing health inequalities. The number of hospitals and beds in Estonia has decreased over time. Despite the COVID-19 pandemic, bed capacity did not increase and stood at 419 beds per 100 000 population in 2022 (Kasekamp et al, 2024). Since 2013, the number has been consistently below the EU average. In addition, bed occupancy rates have fallen to 66%, which is average for the EU, following a focus on strengthening primary care (Kasekamp et al, 2024). This focus has emphasized incentivizing the establishment of health centers with multidisciplinary teams, strengthening the role of family nurses, and investing in primary care infrastructure.

Domain 2: Human Resources for Health (HRH) governance

The team responsible for HWF planning operates within the Ministry of Social Affairs, but not as a distinct unit. At the moment of writing this report, the unit consists of 4.5 FTE, including two persons who work full-time on the HEROES project and who will leave after project's completion. The unit is headed by ministry's HWF Policy Lead – a new position, which was established in early 2025. This team acts as the main coordinator for all HWF planning activities in the country. Currently there are two formal coordinating bodies (committees), which are responsible for establishing training quotas for specialty doctors (University of Tartu) and other medical professions (Tallinn Health University of Applied Sciences and Tartu Applied Health Sciences University). It should be noted here that all medical training in Estonia is financed not by the Ministry of Social Affairs, but by the Ministry of Education. The committees' members consist of representatives from the Ministry of Social Affairs and the Ministry of Education, universities, and professional associations. While in the past training quotas were established via expert discussions with occasional input from ad hoc research, HEROES work established in 2025 a forecasting model, which has taken a central role in planning activities.

Stakeholder landscape: roles, power, and interests in HWF Planning

The table below shows the key stakeholders in the Estonian HWF planning process as of 2023
(I = Interest; P = Power):

Name of stakeholder (grouped)	DATA		PROCESS		SKILLS	
	I	P	I	P	I	P
Health Board	H	H	H	L	H	H
Institute for Health Development	H	L	L	L	H	H
Health Information Systems Centre	H	H	L	L	L	L
Health Insurance Fund	H	L	H	L	L	L
Ministry of Education	H	H	H	H	L	L
University of Tartu	L	L	L	H	L	L
Tallinn Healthcare College	L	L	L	H	L	L
Tartu Healthcare College	H	L	H	H	L	L
Healthcare Workers Union	L	L	L	L	L	L
Association of Family Doctors	L	L	L	H	L	L
Nurses Union	H	L	H	H	L	L
Doctors Union	L	L	L	L	L	L
Association of Junior Doctors	H	L	H	L	L	L
Union of Medical Emergency	L	L	H	H	L	L
Hospitals Association	H	H	H	H	H	L
Private Healthcare Association	H	H	H	H	H	L
Qualifications Authority	H	L	H	L	H	H

The stakeholder list consists of three main categories: (1) agencies operating under the jurisdiction of the Ministry of Social Affairs, (2) higher education institutions, and (3) professional associations. There are some notable exceptions such as: Ministry of Education is included as the financing body of all healthcare related education and employers are represented by the Hospitals Association. The Ministry of Social Affairs is missing from the original table due to human error, it holds the primary responsibility for coordinating all HWF-related planning processes, analyzing data, designing forecasting models, facilitating stakeholder dialogue and initiating policy changes. As a result, its interest and power are high across all dimensions - data, tools and planning skills - given its central role in establishing national HWF policy.

Agencies operating under the Ministry of Social Affairs wield considerable power when it comes to Data as they either collect and manage HWF data or host HWF databases on their servers. Their interest and power under the column of Tools and Skills are however considerably lower as they are not legally required to design forecasting tools or initiate planning processes. The higher education institutions scored relatively low across all domains. Their involvement during the HEROES project has been, however, active as they have supplied the project team with student-related training data. Similarly, the professional associations scored low across all domains, but they have been excellent partners for the project team in validating both models' input data and output data methodology. However, the project team does not consider professional associations to become active users of the forecasting tools – it is likely they remain as external validators for the unforeseeable future.

Domain 3: HWF planners' capabilities

The following text analyzes HWF planners' capabilities for successful use of the three forecasting models outlined above. Targeting training was crucial to achieve Estonia's goals regarding the HEROES. The necessary skill set to successfully engage with developed models depends largely on user's role and level of interaction, particularly whether they work solely with the model's front end or also engage with its back-end components. As HEROES team members will leave the Ministry of Social Affairs after project ends, a handover has been mapped out and a new person responsible for model's maintenance designated within the Ministry of Social Affairs. This person must have a broad range of capabilities, including (but not limited to) the following domains: (1) Strategic thinking: integrating the forecasting models into the broader HWF planning framework, mapping which target groups use the forecasting models to what ends, ensuring models' long-term utilization, (2) Data and tools: data collection, data analytics, data integration into the model, advanced Excel-skills and (3) Soft skills: collaboration and communication, stakeholder involvement. This list is far from exhaustive but provides a good starting point for the handover. It must be noted that for this person the HEROES team has not planned formal training in the form of a separate "event" or "event series". The handover started in February 2026 and will continue until the project ends in July. This is a continuous 6-month process with regular meetings supported by documentation to successfully maintain all three forecasting models.

For users engaging with models' front end only the range of required capabilities is much narrower. This user group consists of the Ministry of Social Affairs and agencies' colleagues focusing on their specific healthcare domains, representatives from higher education institutions, and members of professional associations. These users must: (1) broadly understand how to utilize HWF forecasting in their specific domain, (2) how to input data into the model to achieve the desired output and (3) how to correctly interpret the data output in the context of their specific healthcare domain.

From plan to training activities, skills and competency gains during HEROES

The HEROES team has organized three training sessions as of February 2026, both of which were of practical nature:

January 20, 2026: 24 participants in online format, mainly from educational institutions and colleagues from Ministry of Education.

January 27, 2026: 11 participants in online format, mainly from professional associations.

February 17, 2026: 22 participants in online format, mainly residency supervisors at Tartu University.

Domain 4: HWF data and models

HWF Data: Sources

Supply Data

Three main HWF supply databases were utilized as outlined below.

Healthcare Professionals' Information System (Health Board): this serves as the primary source for most of the data and indicators across all three model components. The dataset includes records for 21,393 healthcare workers across 77 specializations, including graduation years, employer types, and employment regions.

Contractual Workload Dataset (National Institute for Health Development): the number of available Full-Time Equivalents (FTEs) is derived from this dataset by calculating the average contractual workload specific to each profession.

Education Statistics (Ministry of Education and Research & Higher Education Institutions): inflow indicators from the education system are calculated using datasets from the Ministry and the institutions providing healthcare training. The following metrics are applied across all 77 specializations:

- Average Actual Study Duration: Calculated based on statistical data of past 3–5 years regarding the actual time required for students to graduate.
- Actual Admission Rate: A calculated average of the past 3–7 years, depending on the program.
- Dropout Rate: Determined by analysing longitudinal data on admissions, graduations, and study cancellations.
- Direct Entry Rate: Identified by cross-referencing graduate lists with active records in the Healthcare Professionals' Information System.
- Annual Staff Turnover Rate: Calculated by analysing time-series data within the Healthcare Professionals' Information System.

Demand Data

Two main HWF demand databases were utilized as outlined below.

Healthcare Service Utilization (Estonian Health Insurance Fund): These datasets are integrated into the Primary Healthcare Workforce model. With the help of an allocation key (average time spent per service type) that was updated during the project, the data allows for comparison between FTE in supply and FTE in demand. Service utilization data is split across service type, profession, age group, region, and epidemiological structure. Demographic Projections through 2050 (Statistics Estonia): population projections serve as the primary driver for forecasting future service demand. The model combines current annual service utilization averages (by region and age group) with projected population shifts in the target year.

Qualitative data

Following the experiences shared by other participating Member States, Estonia considered the feasibility of integrating qualitative components into the model. The current intention is to eventually establish a working-level community of experts that would provide regular assessment of variables, including:

- Shifts in disease burden: long-term epidemiological trends.
- Technological advancements: the impact of digital health and automation on workforce needs.
- Evolution of work organization and practices: assessing changes in clinical workflows and delivery models.
- Workplace expectations: addressing shifting requirements for professional environments and employee well-being.

Advanced Minimum Data Set: achievements under HEROES

AMDS table, updated as of February 2026:

Quantitative data set	Supply side					Demand side	
	Labour force	Training	Retirement	Outflow migration	Inflow migration	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						
Geographical area	X	X	X	X	X	X	X
Specialization	X	X	X	X	X		
Country of first qualification	X	X	X	X	X		
Gender	X						

Qualitative data set	
	Care organisation
Teamwork	X
Task shifting and skill-mix	X
Reconfiguring health services including digital	X
	Health Indicators
Mortality and morbidity of HWF	X
Mental health and well-being of HWF	X
HWF equity	X
	Labour market
Financial investment, economical background	X
Performance and productivity	X

Data available and used for planning
Data available but not used for planning
Data not available but needed for planning
Data available but needs improvement
Data available/included as a result of HEROES

During the project, available datasets were mapped, and a thorough data audit was conducted. It was determined that the existing data is sufficient to build models tailored to the Estonian HWF planning context. While the quality of the supply-side data was found to be generally high, the demand-side data presented certain challenges. Specifically, approximately 10–20% of primary care nursing visit data was found to be unlogged. However, these issues were not significant enough to undermine the overall usability of the primary care model. Furthermore, the discussions regarding the data quality gaps have already yielded positive results; the renewed interest in the data by end-users has highlighted the need to improve the processes, which makes it easier for the Estonian Health Insurance Fund to implement changes in data collection process.

HWF Data: improvements

Future developments focus on optimizing data collection methods and refining model functionalities. For instance, The National Institute for Health Development, the Health and Welfare Information Systems Centre, the Estonian Health Insurance Fund, and the Ministry of Social Affairs are currently exploring more efficient ways to collect contractual and actual workload data. The most promising option involves integrating the Healthcare Professionals' Information System with the Employment Register, managed by the Estonian Tax and Customs Board. This integration would significantly improve the accuracy of contractual and actual workload data and enable near-real-time availability, eliminating the current six-month reporting lag (contractual and actual workload data is collected in November and published in June).

HWF Data: HEROES contributions and future directions

Responsibility for the future development and maintenance of the three developed models will be transferred to the Analysis Department of the Ministry of Social Affairs. This gradual handover commenced at the end of January 2026. The development process has followed Agile principles with rapid development of Minimal Viable Product and short iteration loops to gather user-feedback for improvements. This has helped to test a wide range of functionalities. Even though not all of them are included in the versions that will be handed over to the Analysis Department, a vast majority of the functionalities have received positive user feedback and are considered insightful and relevant. Considering the starting point, it is fair to assess that thanks to the somewhat less structured but more fast-paced and user-feedback oriented Agile approach, the team has managed to get further in the model development than they would have managed with a more traditional development approach, where users are given access to an end product with finalized functionalities.

Moving forward, further development of the three developed models is very likely to slow down for at least 1-2 years to give end-users enough time to utilize the model in their daily work and identify the areas of improvement. Due to resource constraints, it is unlikely that a large-scale development will resume soon; however, small improvements should be feasible. During the development it has become clear that the most suitable way to develop and maintain the model is to find a person who is a very experienced healthcare workforce subject matter expert and can drive the development of functional requirements based on his/her own experiences. The Ministry of Social Affairs has managed to find a suitable person to fulfil that role, and that gives hope that the critical step from development to go-live and maintenance will be successful.

HWF Planning Models: design, application and HEROES contribution to HWF Planning Models

The Ministry of Social Affairs' in-house project team has developed three distinct models. While each tool adheres to a unified methodological approach and utilizes the same core datasets, they have been developed separately for two reasons: (1) Functional Diversity - each model addresses significantly different functional requirements and serves distinct end-user groups and (2) Technical Optimization - due to the high level of detail and structural complexity, it was not feasible to capture everything in a single Excel file without compromising performance and usability.

The usability of the models has been evaluated throughout the development in the form of end-user feedback. The accuracy of the models has not yet been evaluated as insufficient historical data are available to compare model projections with actual outcomes. However, accuracy will be monitored in the future by the department responsible for maintaining and improving the models.

Primary health workforce model

The model was developed between January 2025 - August 2025. It includes family doctors, general practitioners, nurses, midwives, physiotherapists, speech therapists, and clinical psychologists. In total, there are approximately 5,000 healthcare professionals in the model. The model supports the implementation of the Primary Health Development Plan through 2035, and ongoing reforms related to the primary health system. The model is meant for experts implementing the Development Plan to help them understand the primary health workforce context and to shape the policy measures. It is important to note that the model has no formal role in policy making but is intended as a daily tool for experts to make better informed decisions in the context of projected labor shortages in the coming years. The model projects future workforce supply, based on users' choice of target date, allows the design of a custom scenario where all main indicators can be changed by the user, and the user can see the impact of these changes. Demand forecasts are driven by average service usage per year by age group and region and consider demographic changes. Demand data includes also the epidemiological structure of provided services, however future projections of disease burden are purely based on user assessment, i.e. user predicts the percentage of increase/decrease over chosen time-period. The model allows projections up to 25 years into the future and includes rudimentary task-shifting modelling.

Emergency medical services forecasting model

The model was developed between September 2025 - November 2025. It includes doctors, nurses, emergency medical technicians and ambulance technicians across all their roles in the Estonian ambulance system. In total, there are approximately 1,700 healthcare professionals in the model. The model supports the execution of Ambulance Development Plan until 2035 and may potentially support the procurement of ambulance services planned in 2027 or 2028. The tool is meant for regular use among policymakers and experts across the Ministry of Social Affairs. The model provides a statistical overview of ambulance workforce trends across professions and ambulance roles, helps to understand inflow and outflow trends and workforce cross-utilization among different ambulance service providers as well as between ambulance and hospitals. It has a functionality to allow users to determine the number and composition of ambulance brigades across regions and projects the full-time equivalent (FTE) workforce required for each role to staff these brigades by the selected target year. The user can also change variables such as inflow from higher education institutions, changes in in-service training volumes, and the rates of annual staff turnover. The model allows projections up to 25 years into the future.

Healthcare workforce training intake model

The model was developed between December 2025 - January 2026. It includes 77 professions, including all doctoral and nurse specializations taught in Estonia. In total, approximately 21,000 healthcare professionals are included in the model. The model supports the annual residency intake quotas planning and 4-year planning of higher education (e.g. nurses, physiotherapists, pharmacists) intake quotas. In addition, it contributes to regular statistical overviews and serves as a simple modelling tool for health workforce trends that stakeholders have been calling for quite some time. The main target group are those involved in planning the intake quotas, however it is foreseen as a useful tool for everyone who needs a quick and easy overview of the health workforce trends and the drivers behind them. The model provides a statistical overview of health workforce trends across various data points such as number of employees within and outside the healthcare sector, age distribution, type of employer, region, annual staff turnover and outflow due to retirement as well as inflow metrics such as admission, drop-out and graduation rates and the rate of professional placement. Scenarios can be designed across various study and employment related indicators up to 25 years into the future. The model does not include demand modelling but allows to design scenarios that inform the user about the necessary intake quotas to reach needed workforce levels.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

In the political domain, the main sustainability action is the drafting of HWF policy action plan, which would integrate HWF policy planning into a wider Ministry of Social Affairs strategy framework ensuring cross-departmental support across the Ministry of Social Affairs. The process of drafting the HWF policy action plan also includes elements akin to HEROES policy dialogues. In the HRH governance domain, the continuous operation of newly established HRH team is crucial in enabling to push the HWF agenda in a more centralized way as opposed to having HWF topics fragmented in separate Ministry of Social Affairs departments. In the HRH planners' capabilities domain, the HEROES team has identified the person responsible for all three models after the project ends. A series of orientation meetings have been organized since January 2026, which ensured both a smooth handover and set the ground for successful future maintenance of the models. In the Data and model's domain, the goal is to prepare technical documentation for all the models to make sure the model can be further developed and maintained after the current HEROES team employment contract ends in July 2026.

As Estonia has benefited significantly from the cross-country collaboration framework established under HEROES, it is keen to share its experience with other countries embarking on the development of their first health workforce planning and forecasting models.

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COUNTRY REPORT

GERMANY



6.4 COUNTRY REPORT: GERMANY

Introduction

National HWF Planning System before HEROES

The German health system is one of the oldest in Europe, and is largely self-administered and decentralized with statutory health insurance (SHI) and long-term care insurance as core components. This means that the federal state defines the framework for medical care and its responsibilities. Within the Federal Government, the Federal Ministry of Health (MoH) has primary responsibility for the health policy. It enacts legislation and regulations for this purpose. However, the details of how the system is organised and structured, and above all what medical treatments, operations, therapies and medicines are financed by the health insurance funds, are decided within the healthcare system. This self-administration of the healthcare system is carried out jointly by representatives of the medical, dental, and psychotherapeutic professions, hospitals, health insurance funds and insured persons. Its supreme decision-making body is the Federal Joint Committee (G-BA). The statutory health insurance sickness funds and the national and regional associations of statutory health insurance physicians are public bodies; whereas the Federal Association of Hospitals is a private association. For outpatient care a demand-based planning (“Bedarfsplanung”) is used to ensure that an adequate number of qualified healthcare professionals are available to meet the population’s health needs across regions. The G-BA defines such ratios in a national demand-based planning guideline. The implementation at the regional and local level is the responsibility of the individual associations of SHI physicians. In agreement with the state associations of SHI funds and substitute health insurance funds, these associations must draw up a requirement plan to ensure the provision of care by contracted physicians. In doing so, they may deviate from the requirements of the G-BA to address regional specificities, ensure medical care in underserved areas, or handle specific structural needs. Regional specificities may encompass a variety of factors, including demographic characteristics, regional morbidity rates, and spatial considerations.

The 16 federal states (“Länder”) plan inpatient care and, under the dual hospital financing system, cover the costs for the intensive care unit in hospitals. The federal states are also responsible for organising and providing emergency services.

In Germany, comprehensive health workforce (HWF) data is available for system planning purposes, such as through the federal health reporting (GBE). However, due to federalism and the corporatist structures of the health system, the data landscape is fragmented, and heterogeneous and data often serves specific purposes. To date, no integrated HWF monitoring and forecasting on the federal level has been in place. At regional and federal levels, the prevailing HWF monitoring approaches were fragmented, limited in scope, and/or provided coverage of health occupations, sectors, and institutions only partially. Available data sources frequently proved to be incompatible. Due to the nature of professional qualifications in healthcare, inter-occupational mobility is often restricted, limiting flexibility in matching supply and demand. To address these gaps, a feasibility study (Maier et al., 2024) was conducted with the aim to explore options to establish a detailed, long-term supply and demand monitoring of healthcare professions.

HEROES: Key Achievements

During HEROES Joint Action (2023–2025), Germany successfully achieved the following key milestones in strengthening its HWF planning system:

- **2024: Completion of the feasibility study and commissioning of the project**

A feasibility study was conducted to establish a detailed, long-term monitoring of the demand for and supply of healthcare professions (Maier et al., 2024). In this study, the available data in the healthcare sector was evaluated, compatibility of various data sources was analysed, and a projection concept was developed. Following this, the concept was discussed with relevant data holders, scientists, and representatives of various ministries and further refined within the framework of the HEROES Joint Action. Based on the feasibility study, the Federal Ministry of Health commissioned a detailed, long-term monitoring of the demand and supply of healthcare professions ("Health Workforce Monitoring for the Federal Ministry of Health (MoH)").

- **2025: Harmonizing the data**

Although extensive HWF data is available, its utilization for the HWF monitoring is complex. The main shortcoming is the lack of a holistic database or integrated structure that consolidates these data sources. According to the findings of the feasibility study, data sets held by different governmental and non-governmental bodies were unharmonized, heterogeneous and granular. This is why the data sets had to be examined, combined, analysed and extrapolated. A comprehensive analysis was conducted to address the challenge of data granularity, with the aim to be used in HWF forecasting model for both supply and demand sides.

- **2025: Projection of healthcare professions within the German Health Workforce Monitoring for the MoH**

The aim of the German HWF monitoring is to provide a detailed picture of the current and future supply and demand for skilled workers in the individual areas of health and long-term care and regions, taking into account different qualifications, and to make forecasts for the future. Overall, the availability and development of 54 occupational groups in the healthcare and nursing sectors were considered. This detailed monitoring has been carried out by the Federal Institute for Vocational Education and Training (BIBB) together with two other project partners (GWS and IAB) since November 2024. By the end of September 2025, the initial baseline monitoring and projection of relevant health occupations was finalised. It provides information on the current HWF supply and demand in terms of headcount, full time equivalents (FTE) and types of facility. It also enables projections to be made up to the year 2040.

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

Over the past three years of the HEROES Joint Action (2023-2025), Germany has taken significant steps towards introducing a HWF monitoring and forecasting model on the federal level to be used for HWF planning and political decision-making. The results of the first baseline projection opened the door for possible model extensions with the aim of increasing the informative value of the results. There are several factors that should be taken into account when interpreting results.

For example, if the number of individuals in employment is used as a measure for demand, it should be noted that existing workforce shortages may limit employment levels in those occupations, causing demand to be underestimated. Another lesson learned was the scientific advisory board's suggestion to incorporate epidemiological data, such as a measure for morbidity, into the forecasting model. This could enhance the understanding about the healthcare utilisation and will be useful for projections and developing strategies that can effectively respond to the actual needs of the population. Another lesson from the initial baseline result of the Health Workforce Monitoring was the importance of a regionalisation of the HWF monitoring and forecasting in the future to capture significant differences between regions in terms of health workforce availability, service demand, and system capacity.

The Health Workforce Monitoring for the MoH benefited from the HEROES Joint Action community sharing their experiences and discussing common issues and approaches in the work packages and community of practice meetings on the development of monitoring and forecasting models.

Country level report based on the Sustainable Workforce Intelligence Planning Systems Framework

Domain 1: Political and contextual support

Germany is a federal state with 16 federal states ("Länder") as constituent states and has a population of 83.2 million (in 2025). Compared to other EU Member States, Germany has a high number of physicians and nurses per capita. Nevertheless, securing a sustainable skilled workforce in the healthcare sector remains one of the most pressing challenges for health policy, due to demographic and structural changes.

In recent years, some tentative, simplified or regional monitoring HWF forecasting approaches have been developed. The approaches demonstrated several limitations, including, but not limited to, deficiencies in regional coverage, coverage of occupational groups, and consideration of specific institutional types, both in terms of supply and demand. At that time, no comprehensive, federal HWF forecasting system covering all relevant occupations, sectors, institution types were in place.

This is because none of the available data sources were intentionally designed to enable a full-coverage forecasting model, nor to be compatible with each other. Furthermore, incorporating both the demand and supply dimensions in a differentiated manner is essential, although it increases the overall complexity of the model. Data sources are either mapping supply or demand. Only a few of them can support approximation of both dimensions.

In the health care sector, specific professional certificates are often a prerequisite for ensuring the provision of high-quality healthcare. Compared to other sectors of the economy, the number of professions requiring a license is significantly higher. This regulatory entry requirement for a profession prevents inter-occupational mobility, which can help to balance supply and demand in other labour market segments. For example, individuals who do not have the relevant professional qualification cannot switch to regulated healthcare professions.

In view of these constraints a feasibility study (Maier et al., 2024) was conducted, given the need to develop an effective forecasting system for health personnel that enables policymakers, administrators, and stakeholders to plan for health personnel and thus meet future challenges. The study published in 2024 examined the possibilities of introducing a Health Workforce Monitoring for the MoH. Based on the feasibility study, the BIBB along with their two partner organisations, were commissioned to conduct a "detailed, long-term monitoring of the demand and supply of healthcare professions" (Health Workforce Monitoring for the MoH). The first phase of the project runs from November 2024 to September 2027 and is supported by a scientific advisory board.

Domain 2: Human Resources for Health (HRH) governance

Stakeholder landscape: roles, power, and interests in HWF Planning

HWF planning in Germany involves several stakeholders, in accordance with federalism and the principle of self-administration of the healthcare system. Given the complexity of the health care system, the following section focuses on the federal government level in terms of healthcare policy development and HWF planning, data analysis, and assessment skills.

The HWF planning capacities of federal authorities/agencies depend, among other factors, on availability of data for monitoring of current demand and supply in the health care sector. Current skills shortages for individual occupations and sectors can be adequately identified. However, the ability to estimate precisely the effects of health policy measures across all dimensions of the HWF is limited. At present, it is particularly challenging to estimate the effects of different, interdependent measures. For example: what impact do the various measures to increase labour force potential have on the supply of HWF (e.g. in terms of working conditions, digitalisation, training and education, interprofessional cooperation and skills) and how do these measures interact with each other? In preparation for political decision-making, relevant interest groups, such as professional associations in the healthcare sector, are therefore usually consulted and closely involved. Studies and international experience is also used to obtain information and quantitative and qualitative data.

Name of stakeholder (grouped)	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
		I	P	I	P	I	P
KBV (Association of Panel Doctors)	Involved	H	H	H	H	H	H
DESTATIS (Federal Statistical Office of Germany)	Involved	H	H	H	H	H	H
DKG (German Hospital Society)	Not yet involved	H	L	H	H	H	L
GKV-SV (National Association of Statutory Health Insurance Funds)	Involved	H	L	H	L	L	L
BÄK (German Medical Association)	Not yet involved	L	L	L	L	L	L
Marburger Bund (Association of Employed Doctors)	Not yet involved	H	L	H	L	H	L
BPTK (German Psychotherapeutic Association)	Not yet involved	H	L	H	L	H	L
SHV (Association of Societies for Physiotherapy, Occupational Therapy and others)	Not yet involved	H	L	H	L	H	L
VmF (Medical Assistants Association)	Not yet involved	H	L	H	L	H	L
DPR (German Nursing Council)	Not yet involved	H	L	H	L	H	L
ABDA (Association of Pharmacists Associations)	Not yet involved	H	H	H	L	H	L
BeVaP (Register of employees of professional care services)	Not yet involved	L	L	H	L	H	L
eGBR (Register for health professionals)	Not yet involved	L	L	L	L	H	L
IAB (Institute for Labor Market and Occupational Research)	Involved	H	L	L	L	L	L
BA, Abt. für Statistik und Arbeitsmarktberichterstattung (Federal Employment Agency, Department for Statistics)	Not yet involved	H	H	H	H	H	H
BMAS, Referat I1 (Federal Ministry of Labour and Social Affairs)	Not yet involved	H	H	H	H	H	H
G-BA (Federal Joint Committee)	Not yet involved	L	L	L	L	L	L
BIBB (Federal Institute for Vocational Education and Training)	Involved	H	L	H	H	H	H

As shown in the table above, there are several stakeholders who either are already involved in the national HWF monitoring process or should be involved. In addition to the ministries and federal authorities, these are health professional associations or associations of the SHI funds. Some of them hold relevant data sets related to their statutory obligations in the context of self-governance in the healthcare sector, e.g. accounting data. These tools can provide valuable insights into population behaviour, helping to inform future planning and decision-making. Some of the stakeholders are also represented in the scientific council of the HWF monitoring and forecasting project. Those can provide, for instance, information about the population's utilization behaviour to determine future needs.

- Health Professional Associations: KBV (Association of Panel Doctors), DKG (German Hospital Society), BÄK (German Medical Association), Marburger Bund (Association of Employed Doctors), BPtK (German Psychotherapeutic Association), G-BA (Federal Joint Committee), SHV (Association of Societies for Physiotherapy, Occupational Therapy and others), VmF (Medical Assistants Association), DPR (German Nursing Council), ABDA (Association of Pharmacists Association)
- SHI Funds: GKV-SV (National Association of Statutory Health Insurance Funds), AOK (Local Health Insurance Funds), Ersatzkassen (Substitute Funds), BKK (Company Health Insurance Funds) a.o.
- Ministries: Federal Ministry of Health, Federal Ministry of Labour and Social Affairs, Federal Ministry of Research, Technology and Space, Federal Ministry for Education, Family Affairs, Senior Citizens, Women and Youth
- Federal Authorities/Others: BA (Federal Employment Agency), BIBB (Federal Institute for Vocational Education and Training), IAB (Institute for Labor Market and Occupational Research), BeVaP (Register of employees of professional care services), eGBR (Register for health professionals)

The following table describes the (clustered) key stakeholders in terms of their interest and power with regard to HWF data, HWF process and tools and HWF planning skills:

Type of stakeholder	DATA		PROCESS AND TOOLS		SKILLS	
	I	P	I	P	I	P
Health Professional Associations	H	H/L	H	H/L	H	H/L
SHI funds	H	H/L	H	L	L	L
Ministries	H	H/L	H	H	H	H
Federal Authorities/Others	H	H	H	H/L	H	H

Domain 4: HWF data and models

HWF Data: Sources

The analysis of relevant and suitable HWF data is complex. A broad array of HWF data coverage is available, albeit with a high level of granularity. Despite its availability, the data is scattered across several organisations, and not all data is accessible yet or can be easily merged with other datasets. An incremental structure is needed that could facilitate data integration. When the HEROES Joint Action started, there was no HWF information system in place that covered all relevant occupational dimensions, sectors, institution types and administrative branches. Therefore, one of the main actions in the feasibility study process was to gain an overview of all the available data and its accessibility, to identify gaps and to prioritise which datasets should be made available. This process remains ongoing in 2026 for further refinement and to perform sensitivity and scenario analyses - such as the impact of changes in hospitalization probabilities on the future demand for care professions- in order to address forecasting uncertainties and assess the impact of measures targeting or affecting supply-demand imbalances.

In fact, data sources being available are very heterogeneous. Due to federalism and corporatism (see section “National Health Workforce Planning System before HEROES”), the following organizations and coordinating bodies (e.g. German Medical Association (BÄK), National Association of Statutory Health Insurance Physicians (KBV)) are processing, holding and publishing relevant HRH Data. Governmental organizations holding general labour market data are relevant, as well as specialized co-ordinating bodies are. Some data sources are full-coverage censuses, others provide samples.

Most relevant data sources are (held by):

- Federal Statistical Office of Germany (DESTATIS): Health personnel accounts calculation (GPR)
- German Medical Association (BÄK): Statistics on Medical Doctors (ÄST)
- National Association of Statutory Health Insurance Physicians (KBV): Federal registry on Medical Doctors (BAR)
- Federal Union of German Associations of Pharmacists: Statistics on Employment

General full-coverage labour market/ educational data sources also being of interest for HWF include:

- Federal Employment Agency (BA): Statistics on Employment subject to social security contributions (BeH)
- Federal Statistical Office of Germany (DESTATIS): Microcensus (MZ), German version of the European Labour Force Survey (LFS)
- DESTATIS: Statistical Report on Vocational Schools and Schools in the healthcare sector
- Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (KMK): Higher education statistics (Hochschulstatistik)
- Federal Institute for Vocational Education and Training (BIBB): Vocational education and Training Statistics (BBS)
- BIBB/ Federal Institute for Occupational Safety and Health (BAuA): BIBB/BAuA Workers’ Surveys (ETB)
- Institute for Labour Market and Career Research (IAB)/ BIBB/ Institute of Economic Structures Research (GWS): Qualifications and Occupations in the future (QuBe)

As data collectors, data holders, and data subjects differ, so do the resulting data structures. Classifications used, socio-demographic variables and scopes of collection are not coherent over the different data sources. To derive insights from the labour market, it is essential that all these figures are harmonised. Most of the relevant occupational data sources is compatible or translatable into the German Classification of Occupations 2010 (KldB). This facilitates the integration of diverse data sources within a comprehensive HWF information system or HWF forecasting model (see following section). Although, there is a need to elaborate and define keys translating foreign occupational classifications to KldB. This also applies to the classification of institutions (within economic sectors). Varying institutional types are registered for HWF, differing according to the data sources. In some data sources like the GPR (Health personnel accounts calculation), (some) institutional types can be assigned to certain economic sectors. The record of economic sectors is relevant for some occupational groups. It is given explicitly in some, but not all HWF-relevant data sources, by German Classification of Economic Activities. This classification is the German derivate of the Statistical Classification of Economic Activities in the European Community (Nomenclature statistique des Activités économiques dans la Communauté Européenne; NACE).

Building on the feasibility study as mentioned in the section “HEROES: Key Achievements”, a standardisation was developed within the framework of the Health Workforce Monitoring for the MoH to harmonise these complex classifications of institutional types and economic sectors. In addition to the microcensus (MZ) of the German Federal Statistical Office (DESTATIS), the statistics on employment subject to social security contributions (BeH) of the Federal Employment Agency (BA) and the German national accounts are the data, being comprehensively expanded. The relevant data input for the number of employed persons and FTEs is the health personnel accounts calculation (GPR) and the associated basic statistics. It is also used to estimate the labour supply by actual occupation and supply-side FTEs. The GPR presents the health professions according to the KldB, but only distinguishes between human medicine and dentistry in the medical field.

The Statistics on Medical Doctors (ÄST) by the German Medical Association (BÄK) classifies the occupations and specialities within the field of human medicine. The billing data for medical services of the National Association of Statutory Health Insurance Physicians (KBV) is used to estimate the number of FTEs from the BÄK's headcount analysis using the demand planning weights of statutory health insurance physicians. The Federal registry on Medical Doctors (BAR) is used to integrate data on internists working as general practitioners to reflect the number of general practitioners for adults.

To link demographic demand for healthcare services with population projections, the hospital statistics covering the inpatient sector is used to match staffing requirements to hospital patients by specialist department. The Care statistics collects comprehensive structural data on inpatient and outpatient long-term care facilities, people in need of long-term care and nursing staff. Billing data from the National Association of Statutory Health Insurance Physicians and Dentists (KZBV) is used to project demand for outpatient medical and psychotherapeutic services. The quarterly report on remedies from the SHI funds reports on gross sales generated with therapeutic products, as well as on the number of prescription forms issued and treatment units used. The quick information on pharmaceutical products from the SHI is a key instrument for monitoring and controlling the supply of pharmaceutical products in the SHI system and reports, among other things, on the number of prescriptions for medicines.

Advanced Minimum Data Set: achievements under HEROES

The table below also shows the Advanced Minimum Dataset revised as of 26th of February 2026.

Data available and used for planning							
Data available but not used for planning	Note: Germany referred to input data to the already conceptualized forecasting model.						
Data not available but needed for planning							
Data available but needs improvement							
Data not available/ needing improvement but not used (yet) for planning within the already conceptualized forecasting model							

Quantitative data set	Supply side					Demand side	
	Labour force	Training	Retirement	Outflow migration	Inflow migration	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						
Geographical area	X	X	X	X	X	X	X
Specialization	X	X	X	X	X		
Country of first qualification	X	X	X	X	X		
Gender	X						

HWF Data: HEROES contributions and future directions

Overall, the analysis of Health Workforce data sources has resulted in a comprehensive mapping of available datasets across multiple institutions and administrative levels, forming the basis for the development of an Advanced Minimum Dataset for workforce planning. A key achievement of this process is the systematic identification and categorisation of data sources, as well as the initial steps towards harmonisation, in particular through the use of the German Classification of Occupations (KldB) as a common reference framework. This has enabled a structured integration of heterogeneous data into a coherent analytical framework. At the same time, the integration process remains ongoing, requiring continuous refinement and further development of translation keys and harmonisation approaches to support robust health workforce forecasting.

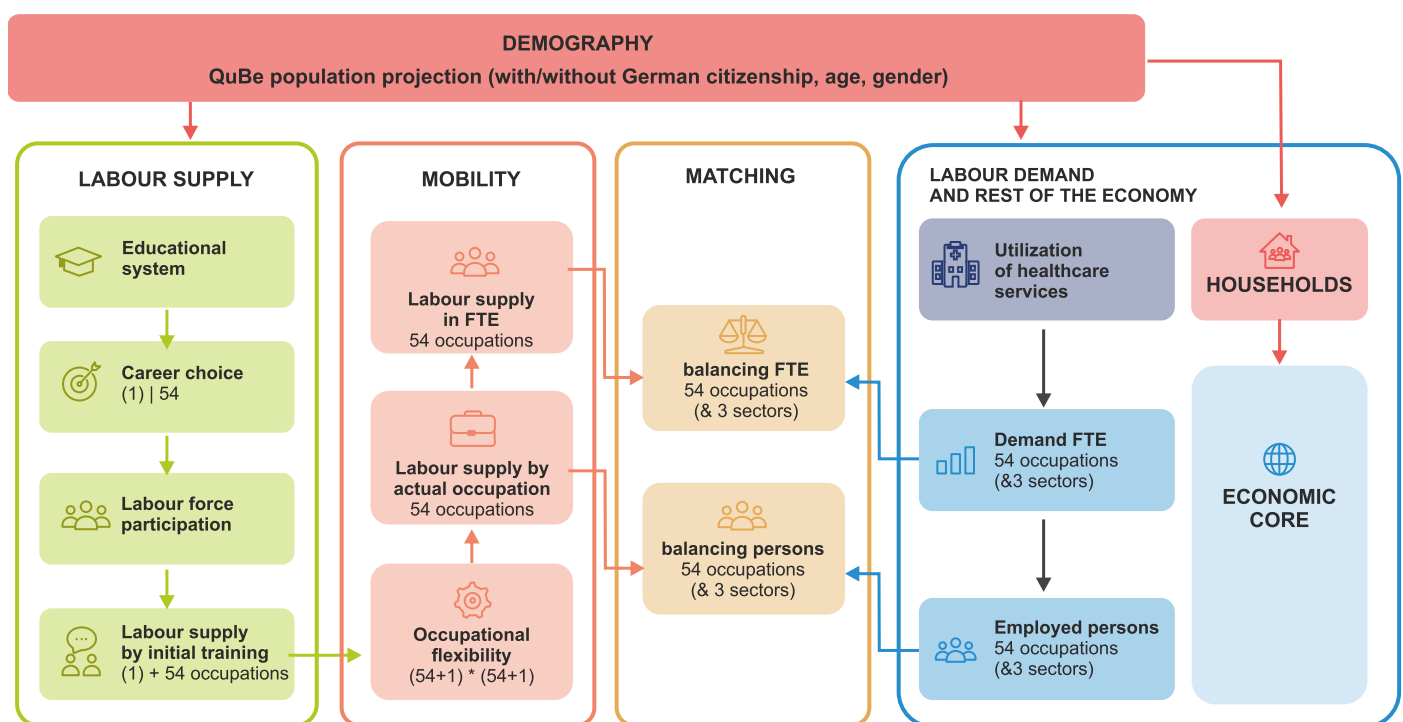
HWF Planning Models: design, application and HEROES contribution to HWF Planning Models

The aim of the model is to identify occupational imbalances in the health professions at an early stage, and to assess the impact of measures targeting or affecting these imbalances. In the baseline projection of the Health Workforce Monitoring for the MoH, supply and demand for 54 healthcare professions are projected up to the year 2040, as headcount, FTEs, and across three types of healthcare settings (inpatient, outpatient, and other), by extrapolating past and current developments on national level.

The projection concept used is essentially based on the methodology of the project “qualifications and occupations in the future” (QuBe-Project, www.qube-projekt.de, Zika et al., 2025). Like the QuBe-Project, the projection concept used in the Health Workforce Monitoring for the MoH is based on the concept of actual demand. The projection of labour demand is therefore based on the number of people in employment and FTEs, rather than on the number of vacancies. As a result, the baseline projection extrapolates past and current developments into the future.

The figure below illustrates the main models and modules used in the Health Workforce Monitoring for the MoH. Demographics (as illustrated in the figure below) are a decisive factor that influences not only the available labour supply but also the demand for healthcare services. The development of certain population groups, such as children or people in need of care, is particularly relevant in this context.

Projection concept: Health Workforce Monitoring for the Federal Ministry of Health



Source: QuBe-Project, own illustration.

The number of pupils, trainees, and students and their career choices are of interest for future labour supply (green in the figure above). Here, the QuBe-Project refers to the BIBB supply model (Kalinowski, 2025), which differentiates between 144 occupational groups regarding career choices. For the Health Workforce Monitoring for the MoH, these career choices are further subdivided into the 54 detailed healthcare professions. All other occupations are also considered, as they are relevant for skilled labour monitoring in the context of occupational mobility as occupations of origin or destination. Labor force participation is projected into the future according to gender, age, nationality (German and other citizenship), and qualification level. It is assumed that past trends (increase in the labour force participation rates among women and older age groups) will continue. The QuBe-Project refers to the labour supply according to the highest professional qualification, regardless of the actual occupation, as labour supply by initial training. They show how many individuals with the relevant qualifications are available on the labour market.

However, it should be noted that not all individuals in the HWF remain in their initial training occupation throughout their careers. They may change jobs. This occupational mobility (orange in the figure above) is reflected in the gender-, age-, nationality- and qualification-specific mobility between the highest occupational qualification and the occupation practiced (or actual occupation). It determines how many persons available on the labour market are available for a particular occupation. The QuBe-Project refers to this labour supply as labour supply by actual occupation. The gender and age structure of the labour force in turn determines the preference for working hours, which estimates the labour supply in terms of FTE to be calculated.

On the demand side, demographic trends and the economic development play a role (blue in the figure above). Demographic change has a direct impact on the demand for FTEs in the three sectors for the 54 selected occupations of interest using health services by certain population groups. The sector-specific ratio of FTEs to employed persons can be used to calculate the number of employed persons, which can then be balanced against the corresponding labour supply, as is the case with FTEs.

As outlined in the section ‘HWF Data Sources’, a comprehensive assessment of the stocks of labour supply and demand in terms of both headcount and FTEs in the 54 healthcare professions and their subsequent projection requires the harmonization of multiple data sources which, among others, was achieved during HEROES Joint Action (see section “HEROES: Key Achievements”). However, this data not only provides the basis for modelling, but is also crucial for the interpretation of the results. This is because the results of the present baseline projection must be interpreted under the assumption that previous patterns of behaviour in the use of health services will continue under the existing incentive structures. Accordingly, they indicate the policy-relevant levers for education and labour market planning by indicating the developments most likely to occur if current behaviours remain unchanged. Deviations from the baseline can be captured through alternative scenario modelling. With the assistance of appropriate assumptions, this facilitates the illustration of the effects of selected measures and reforms through a comparison of these scenarios with the baseline projection.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

The initial baseline projection is currently available to the MoH. As the HWF database and modelling methodology are updated and revised regularly to account for ongoing changes in prevailing trends and general conditions, an updated forecast will be available by autumn 2026. The first regionalization of the baseline projection is scheduled for autumn 2027. So far, regional differentiation is initially planned according to federal states and/or labour markets of regions.

Generally, the current results obtained from the HWF-Monitoring should be interpreted under the assumption that patterns of behaviour in healthcare utilisation will continue under the existing incentive structures. Deviations from these patterns can be modelled in multifaceted scenario analyses, allowing the effects of selected measures or reforms to be assessed through comparison with the baseline projection using appropriate assumptions. Should the pilot project demonstrate its efficacy and reliability in terms of annual data provision and demand/supply estimations of the HWF, and should the information it provides prove to be relevant for political decision-making and planning, the continuation of the HWF monitoring will be considered and made available for multi-level use.

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COUNTRY REPORT

MALTA



6.5 COUNTRY REPORT: MALTA

Introduction

National HWF Planning System before HEROES

System Overview

Malta operates a predominantly tax-funded national healthcare system that provides universal coverage through a strong public sector, complemented by a growing private healthcare market. Prior to the JA (HWF) (2016) and SEPEN, HWF Planning was not positioned as a strategic national priority. These initiatives represented a critical turning point, exposing long-standing weaknesses in data availability, governance arrangements, and analytical capacity, while highlighting the importance of adopting a structured, Evidence-Based approach to HWF Planning.

The findings and recommendations emerging from these initiatives provided the impetus for reform. HWF Planning was formally embedded within the Malta Health Strategy 2022–2030, marking a shift from ad hoc and reactive workforce management towards a more systematic and forward-looking approach. This policy commitment laid the foundation for the operationalisation of workforce planning through the HEROES Joint Action, which sought to translate strategic intent into concrete tools, processes, and governance arrangements.

With technical support from the World Health Organization (WHO), Malta began strengthening its HWF Planning System by clarifying institutional roles, improving coordination across stakeholders, and introducing more robust planning methodologies. These developments signalled a move towards a proactive and sustainable model of workforce planning, aligned with population needs, service demand, and future system challenges.

Governance and Processes

Prior to HEROES, HWF Planning in Malta involved multiple actors operating within a fragmented and decentralised data environment. Core human resources for health data were held at source within individual public health entities, primarily covering employment and administrative information and limited to the public sector. There was no systematic visibility of the private healthcare workforce.

Information on workforce inflows and outflows was dispersed across educational institutions, regulatory councils, employment agencies, and other bodies, with limited direct access for planners. Regulatory registers were not consistently updated to distinguish between active and inactive professionals, further limiting their usefulness for planning purposes.

Although demand-side data such as demographic trends and service activity were available, these were not systematically integrated, validated, or analysed across stakeholders.

As a result, the data landscape lacked coherence, comparability, and timeliness, constraining the development of reliable workforce projections and limiting responsiveness to emerging trends. The absence of integrated data systems increased reliance on informal communication and manual data collection, reducing efficiency and consistency. These challenges highlighted the need for improved data governance, enhanced coordination among data holders, and mechanisms to integrate workforce, education, employment, and service delivery data to support Evidence-Based HWF Planning.

Baseline Strengths and Limitations

Health workforce planning responsibilities in Malta were historically characterised by short-term, fragmented, and largely reactive processes. Public sector Health Workforce Planning relied primarily on annual vacancy data collected from individual entities, typically reflecting immediate or short-term needs. These data were neither centralised nor harmonised, and private sector workforce requirements were not captured.

Long-term planning tools and scientific forecasting methodologies were largely absent at national level. HWF decisions were often based on assumptions or professional judgement rather than robust analytical models. There was limited use of approaches such as task shifting, skill-mix optimisation, or structured engagement with educational institutions on numerous clausus adjustments, amongst others.

Analytical capacity represented a further constraint. While expertise existed in analysing demographic, epidemiological, and service delivery data, there was limited capacity specific to health workforce analytics and forecasting. Capacity-Building initiatives supported by WHO and ESF-funded leadership and management programme[14] increased awareness of Evidence-Based planning among senior leaders and HR personnel, but development was required. Strengthened collaboration with universities, regulatory bodies, employment agencies, policymakers, and healthcare professionals was recognised as essential to address persistent data-sharing and coordination challenges.

HEROES: Key Achievements

During the HEROES, Malta achieved several milestones that significantly strengthened and matured its health workforce planning system.

- **Strategic Anchoring of Health Workforce Planning (2022-2023)**

With the support of WHO, Malta developed its National Health Workforce Strategy 2022–2030. For the first time, a dedicated health workforce chapter was included in the Malta Health Workforce Strategy 2022–2030 (Ministry for Health, 2022) under the priority “Supporting and Empowering the Health Workforce”. This milestone formally recognised health workforce planning as a strategic national function. HEROES provided the operational mechanism to translate this strategic commitment into concrete actions, tools, and governance arrangements.

- **Consolidation of Governance and Stakeholder Engagement (2024-2025)**

HEROES introduced a structured framework for strengthening governance arrangements and stakeholder engagement. A broad range of stakeholders including health authorities, education institutions, regulatory bodies, employment agencies, unions, and data holders were systematically engaged through joint activities and national policy dialogues. This process clarified roles and responsibilities, strengthened coordination, and fostered shared ownership of workforce planning objectives, repositioning HWF Planning as a cross-sectoral responsibility rather than a siloed Human Resources (HR) function.

- **Strengthening Data Awareness and Data Governance (2024-2025)**

Participation in HEROES significantly increased national awareness of existing HWF data sources and their limitations. Progress was achieved through harmonisation of HR data across public entities, engagement with Jobsplus[15] on workforce coding, and the development of interim databases capturing education inflows. These efforts supported the longer-term objective of establishing a central health workforce data repository as a cornerstone of Evidence-Based planning.

- **Enhanced Understanding of Sustainability-Oriented HWF Planning (2025)**

Engagement with the HEROES sustainability framework supported a conceptual shift towards viewing HWF Planning as a long-term, system-level responsibility. Stakeholders increasingly recognised the interdependence of political commitment, governance, analytical capacity, workforce competencies, and data systems. This perspective reframed discussions away from addressing immediate shortages alone and towards building workforce resilience, with greater emphasis on task shifting, emerging roles, service continuity, and alignment with Malta's demographic and epidemiological trends.

- **Capacity Building and Planning Tools (2024-2025)**

HEROES strengthened national capacity through targeted training and the introduction of the HWF Planning and Forecasting Planning Model developed by NIVEL and adapted for Malta with WHO support. Information seminars and hands-on workshops improved understanding of workforce modelling, data requirements, and scenario analysis. Stakeholder feedback informed refinements, enhancing ownership, usability, and acceptance. Additional training in change management and health economics is planned to further strengthen analytical capacity.

- **Policy Dialogue and Institutionalisation (2023-2025)**

Three national policy dialogues held between 2023 and 2025 facilitated structured reflection, consensus building, and institutional learning. A key outcome was the shared recognition that workforce planning must be continuous, strategic, and embedded within routine policy processes. HEROES also supported the establishment of health workforce planning as a strategic function within the People Management Division, strengthening institutional sustainability beyond the Joint Action.

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

Adoption

- HEROES catalysed a cultural shift from precedent- and urgency-driven decision-making towards Evidence-Based practice, where evidence became essential for credibility, accountability, and trust rather than an optional add-on.
- Early and meaningful stakeholder involvement—clinicians, planners, managers, analysts—was recognised as critical to securing ownership and ensuring relevance of planning outputs.

Implementation

- Stakeholders transitioned from passive recipients to active contributors, improving the credibility and applicability of workforce planning processes.
- Involving those with direct responsibility for workforce planning, led by the People Management Division, reduced silos and strengthened interpretation of evidence within real service contexts.

Upscaling

- International collaboration across the HEROES network enabled shared learning, allowing countries to compare challenges and validate approaches, reinforcing confidence to adopt new methods.
- HEROES showed that sustainable system change requires cultural transformation, strong stakeholder ownership, and robust institutional structures to support ongoing workforce planning and forecasting efforts.

Country level report based on the Sustainable Workforce Intelligence Planning Systems Framework

Domain 1: Political and contextual support

Overview of the Healthcare System

Malta's healthcare system is characterised by a dual model that combines a comprehensive, tax-funded public healthcare system with a growing private healthcare market. Universal free access to care, broad service coverage, and an increasing emphasis on strategic workforce planning are central features of the system, shaped by Malta's small population size, geographic compactness, and demographic trends.

The public healthcare system, managed by the Ministry for Health and Active Ageing (MHA) and financed primarily through general taxation, provides services across the full continuum of care, including primary, secondary, and tertiary services. Mater Dei Hospital functions as the main acute care facility, while primary care services are delivered through a nationwide network of community health centres, ensuring accessibility across the Maltese islands. Services are provided free at the point of use for residents, reinforcing the government's commitment to equity and universal health coverage.

Alongside the public system, private healthcare providers play an increasingly significant role, particularly in outpatient services and elective procedures. These services are financed through out-of-pocket payments and private insurance. While the private sector helps alleviate pressure on public services and can improve system efficiency, it also raises challenges related to equity of access and the distribution of healthcare professionals between sectors.

Maintaining an appropriate balance between public and private provision is therefore essential for effective HWF Planning and for safeguarding the attractiveness and sustainability of the public health system as an employer. Furthermore, services are being outsourced by Government through Public Private Partnerships, mainly aimed at reducing waiting lists for surgeries and other procedures.

HWF Planning in Malta is shaped by its small population and limited labour market, requiring versatile healthcare professionals. High mobility among Maltese workers, especially younger ones moving abroad, challenges retention and planning. Malta relies heavily on foreign-trained staff, especially Third Country National Nurses, Allied Health Professional and Carers, but many use the country as a route to other European nations, affecting long-term retention.

Population ageing intensifies workforce pressures by increasing demand for long-term, chronic, and specialised care. As a result, workforce strategies must balance the retention of locally trained professionals, international recruitment, and continuous upskilling to ensure that workforce competencies evolve in line with changing population health needs.

Position of Health Workforce Planning within the System

Health workforce planning in Malta is overseen by the Ministry for Health and Active Ageing through its People Management Division, which is responsible for workforce strategy, planning, and development across public health entities. The Division works in collaboration with other government departments, educational institutions most notably the University of Malta, and professional regulatory bodies to align education, training, and HWF supply with system needs.

HWF Planning is guided by national health strategies, regular workforce assessments, and forward-looking projections that consider education capacity, retirement patterns, service demand, and emerging health priorities. Political priorities strongly influence workforce development, particularly recent reforms focusing on digital health transformation, integrated care models, and the strengthening of primary and secondary care. These reforms require targeted recruitment, new competencies, and sustained investment in professional development.

Malta's commitment to universal health coverage and public system sustainability has driven policy attention towards retention strategies, upskilling initiatives, and the development of specialised roles. HWF Planning is further shaped by European Union regulations, cross-border labour mobility, and global health risks such as pandemics, all of which necessitate flexibility and international cooperation.

While Malta's small size enables relatively agile policymaking and rapid implementation of reforms, it also exposes the system to vulnerabilities, particularly in highly specialised professions where shortages can emerge quickly. Continued political commitment and institutional capacity remain critical to addressing workforce shortages, mitigating brain drain, and building a resilient health system capable of adapting to future challenges.

Domain 2: Human Resources for Health (HRH) governance

Governance Structures for Health Workforce Planning

HWF Planning in Malta is embedded within the public governance framework of the Ministry for Health and Active Ageing and aligned with national health policy objectives. A major milestone was the adoption of Malta's first Health Workforce Strategy 2022–2030 (Ministry for Health, 2022) which provided a formal mandate for strengthening workforce planning at national level.

Operational responsibility lies primarily within the People Management Division, which coordinates workforce-related functions across public health entities. Historically, planning was fragmented and largely reactive, relying on annual vacancy data submitted by individual entities, with limited forecasting capacity and no systematic visibility of the private sector workforce.

Through participation in the HEROES, Malta has begun transitioning towards a more structured and strategic governance approach. Health workforce planning is increasingly recognised as a core strategic function rather than an administrative HR activity.

HEROES supported clearer role definition, improved coordination among institutions, and the consolidation of planning responsibilities across key stakeholders.

Although a fully institutionalised national workforce planning unit has not yet been established, governance arrangements have been significantly strengthened through formalised collaboration with regulatory bodies, educational institutions, employment agencies, and data holders. Accountability remains firmly embedded within government structures, with workforce planning explicitly linked to national strategy implementation and broader public service functions, including education, labour market policy, and migration management.

Stakeholder Mapping and Analysis

Health workforce planning in Malta involves a wide range of stakeholders reflecting the fragmented nature of workforce data, education pathways, and labour market dynamics. These include government ministries, public healthcare entities, regulatory bodies, education and training institutions, employment and migration authorities, professional associations, unions, and international partners.

HEROES provided a structured platform to systematically identify, map, and engage these stakeholders, strengthening transparency and collaboration. While government bodies retain primary decision-making authority, education providers, regulators, and employment agencies play essential enabling roles. Professional associations and unions contribute representative perspectives, though their strategic influence varies.

Structured policy dialogues conducted during HEROES enhanced mutual learning, reduced institutional silos, and fostered a more collaborative approach to workforce planning across sectors.

Stakeholder landscape: roles, power, and interests in HWF Planning

Health workforce planning in Malta involves multiple stakeholders whose varying levels of power and interest affect the system's ability to meet workforce needs. Central to governance are high-power actors such as the People and Standards Division within the Office of the Prime Minister (OPM) and the People Management Division within the Ministry for Health and Active Ageing. These entities oversee HWF Planning and recruitment but face significant limitations due to fragmented data access, which restricts long-term, Evidence-Based planning and perpetuates short-term staffing solutions. The Minister for Health and Active Ageing, along with the Ministry of Finance and OPM, exert strong influence over priorities and resource allocation, though their involvement in technical planning remains limited.

Stakeholders with high interest but lower power include public healthcare providers, professional departments, and educational institutions such as the University of Malta and Malta College for Arts Science and Technology. While critical to workforce stability and supply, these groups lack structured mechanisms for policy input and data integration.

Regulatory bodies and unions hold essential data yet remain peripheral to planning processes, engaging reactively rather than strategically. Service users, despite being most affected by workforce shortages, have minimal involvement.

Systemic challenges, including fragmented data systems, limited cross-sector sharing, and weak communication, continue to hinder coordinated planning. The HEROES initiative has played a transformative role by promoting transparency, structured dialogue, and capacity building in workforce planning tools. These efforts have strengthened collaboration and laid the foundation for a more sustainable, evidence-driven health workforce governance framework in Malta.

Stakeholder Analysis Matrix

	AS IS – Stakeholder Analysis February 2023 (Malta)	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
			I	P	I	P	I	P
1	HRH -Ministry for Health	Involved	H	L	H	H	H	H
2	HR - MFAA	Involved	H	L	H	L	H	H
3	Minister/s Responsible for health & Active Ageing	Not involved	H	H	L	H	L	H
4	Departments (e.g. Medical, Nursing & Allied) responsible for respective Services	Involved	H	L	L	L	H	L
5	Ministry of Finance / Office of Prime Minister	Not Involved	L	L	H	H	H	H
6	Service Providers (including Entities/ CEOs etc)	Involved	H	H	H	L	H	H
7	Education Facilities (UOM & MCAST & private institutions)	Not Involved	L	L	L	L	H	H
8	Regulatory Bodies of each Profession	Not Involved	L	L	L	L	L	L
9	Employees Representatives	Not Involved	L	L	L	L	L	L
10	Service Users (Patients)	Not Involved	L	L	L	L	L	L

Domain 3: HWF planners' capabilities

Overview of Stakeholder Capabilities

Malta's health workforce planning ecosystem reflects its small size and centralised governance structure. Capabilities vary across institutions, with larger hospitals and HR units possessing practical planning experience, while smaller or specialised services have more limited analytical capacity.

Prior to HEROES, exposure to structured forecasting tools and systematic planning methodologies was uneven. HEROES addressed these gaps by creating structured opportunities for skills development, collaborative learning, and engagement in Evidence-Based workforce planning.

Skills Relevant to Health Workforce Planning

Within the Maltese context, effective health workforce planning requires a balanced set of technical, analytical, and transversal skills that respond to national health system needs and workforce constraints.

Strong data and analytical skills are essential, particularly the ability to collect, validate, and interpret workforce data across public health entities. This includes analysing staff supply and turnover, retirement trends, service utilisation, and education pipelines. Training delivered through the HEROES project strengthened stakeholder capacity in using Malta's adapted workforce planning and forecasting tool, enabling Evidence-Based scenario modelling aligned with national realities.

Equally important are modelling and forecasting skills, given Malta's small labour market, and reliance on both local and international health professionals. Competence in scenario analysis, interpretation of projections, and translation of findings into recruitment, training, and retention strategies is critical. Participation in HEROES activities enhanced stakeholders' ability to assess supply–demand scenarios, identify skill gaps, and understand their implications for sustainable workforce planning.

Finally, effective HWF planning depends on policy, governance, and transversal skills. Planners must operate within interconnected governance structures, ensuring alignment between ministries, health services, regulators, and education providers.

This requires strategic thinking, coordination, communication, and negotiation skills, alongside knowledge of regulatory and public service processes. Priority areas such as change management and health economics further highlight the need to translate technical workforce data into practical policy decisions and organisational change.

From plan to training activities, skills and competency gains during HEROES

The HEROES project delivered targeted capacity-building to strengthen health workforce planning skills in Malta. Training focused on workforce data analysis, forecasting, scenario modelling, and Evidence-Based policy development, supported by practical workshops and policy dialogue sessions. Participation spanned key national stakeholders across health, education, regulation, and employment. A total of four one-day sessions were organised for this purpose for which a total of 194 participants attended. Furthermore, feedback indicated improved confidence and capability in data-driven planning and collaborative policy engagement. Interactive, hands-on one-on-one meetings led by People Management, providing practical guidance on evidence based HWF planning and the use of the tool across various departments were held with 24 different professions. To address constraints such as varied analytical capacity and time limitations, training prioritised core, immediately applicable skills while outlining pathways for advanced learning.

The plan is to ensure continuity and sustainability by maintaining ongoing dissemination of information and providing continuous training in Evidence-Based health workforce planning at both entity and departmental levels. The Maltese Health System would benefit from the following skills and training in the future. This would need further discussion and depends on funding:

- Interprofessional workforce planning aimed at strengthening multidisciplinary team-based care enhancing the cost-effectiveness of skill-mix redesign
- Digital health workforce integration
- Continue enhancing data harmonisation across sectors ensuring workforce tracking mechanisms thus using a unified real time workforce dashboard
- Workforce planning for preventive health strategies

A train-the-trainer model may be especially appropriate to ensure continuity.

Sustainability of Skills Development

To sustain these gains, the Ministry for Health and Active Ageing plans to embed HWF planning training within institutional regular refresher activities. HEROES tools, guidance materials, and standardised templates are being retained as shared resources. Ongoing policy dialogue mechanisms will support continuous knowledge exchange and collaboration, ensuring that both technical and transversal skills are reinforced and that Evidence-Based HWF planning remains integral to national health system governance.

Domain 4: HWF data and models

HWF Data: Sources

The identification of workforce supply and demand relies on multiple data sources drawn from across the health and education sectors. On the supply side, key data sources include employment and human resource records, covering workforce demographics, areas of specialization, recruitment levels, retirements, resignations, and other attrition factors. This data is primarily owned and maintained by the Ministry for Health and Active Ageing.

Additional supply-related data is sourced from educational institutions that feed into the healthcare system. This includes information on student enrolment numbers by course, annual intake capacity, dropout and completion rates, and graduation outputs. Educational institutions are the data owners. Professional registration data also forms a critical data source, particularly the number of healthcare professionals registered with specific regulatory councils and their scope of practice. This data is owned by the respective professional councils. Furthermore, the availability of inflow and outflow migration statistics is essential for robust workforce supply data. Inflow data support an understanding of the potential increase in the health workforce by quantifying additions to overall supply.

Similarly, access to outflow statistics enables a clearer assessment of workforce attrition and depletion. Such data can be systematically collected and maintained by the relevant professional councils.

On the demand side, data sources include patient utilization of healthcare services, service activity levels, and workload indicators, as well as national statistics on disease prevalence, incidence, and epidemiological trends. Such data is owned by national statistics offices, health information systems, and public health authorities.

Advanced Minimum Data Set: achievements under HEROES

HWF Data: improvements

Quantitative data set	Supply side					Demand side	
	Labour force	Training	Retirement	Outflow migration	Inflow migration	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			X	X		
Geographical area	X	X	X	X	X		
Specialization	X	X	X	X	X		
Country of first qualification	X	X					
Gender	X			X	X	X	X

Qualitative data set	
Care Indicators	
Teamwork	X
Task shifting and skill-mix	X
Reconfiguring health services including digital	X
Health Indicators	
Mortality and morbidity of HWF	X- Attritions
Mental health and well-being of HWF	X
HWF equity	X
Labour market	
Financial investment, economical background	X
Performance and productivity	X

Data available and used for planning
Data available but not used for planning
Data not available but needed for planning
Data available but needs improvement
Data available/included as a result of HEROES

Effective Human Resources for Health planning depends on timely access to reliable and comprehensive data. To address this need, the HEROES project has initiated the development of a centralized data repository that consolidates key information required for forecasting Malta's future health workforce needs. This repository will integrate data from educational institutions, including enrolment figures, dropout and completion rates, and programme duration, providing insights into the education-to-employment pipeline. Employment data from the National Employment Agency will also be incorporated, covering work status, sector distribution, and the presence of foreign professionals, enabling a more complete understanding of workforce composition and mobility.

Plans include the eventual inclusion of data from Regulatory Councils on licensed professionals and their scope of practice. While discussions with these councils have been ongoing, GDPR compliance concerns have delayed access, and efforts continue to establish secure data-sharing arrangements. Additionally, the repository will capture historical and current service delivery data across sectors, supporting trend analysis and Evidence-Based scenario modelling.

Centralizing these data sources will significantly improve efficiency by streamlining the transfer of information into Malta's Health Workforce Planning tool, replacing the current fragmented and time-consuming process. The success of this initiative relies on active collaboration among key stakeholders, including ministries, healthcare providers, educational institutions, regulatory bodies, and employment agencies. Encouragingly, engagement with these partners is already underway, fostering a coordinated approach to ensure data accuracy, completeness, and timeliness. This is further corroborated through discussions with the same stakeholders using their expertise in the respective field.

WF Planning Models: design, application and HEROES contribution to HWF Planning Models

Overview of Applied Model

The Health Workforce planning tool was developed in 2021 through collaboration between Malta's Ministry for Health, NIVEL, and the WHO. After a pilot study of the model in 2022 with one professional group, it was refined and formally launched in October 2023 for three categories: General Practitioners, Emergency Department physicians, and Allied Health Professionals. The People Management Division within the Ministry for Health and Active Ageing leads its implementation across all healthcare professions, leveraging its adaptability to different organizational and service delivery contexts.

The tool uses a stock-and-flow approach, projecting HWF supply and demand over time while considering inflows, outflows, and evolving competencies. Unlike traditional headcount-based models, it supports competency-driven National Public Health Workforce planning, estimating not only numbers but also the skills required for safe, effective service delivery. Indicative staffing ratios are included as guidance rather than fixed benchmarks.

Beyond quantitative projections, the tool fosters qualitative policy discussions on training pathways, role redesign, and service organization. Stakeholder engagement particularly with educational institutions and clinical leaders is central to its success, ensuring data validity, shared ownership, and sustainability. These discussions have informed task-shifting strategies, such as delegating dental imaging to Dental Surgery Assistants or semi-urgent ambulance duties to trained Emergency Ambulance Responders, freeing specialized staff for complex tasks. Educational institutions play a key role in creating training pathways, certification programs, and upskilling initiatives to support these changes. The tool strengthens Evidence-Based workforce planning, aligning staffing with service needs and embedding the HEROES Joint Action legacy into Malta's health system.

Supply and Demand Forecasting Logic

Supply and demand forecasting uses a stock-and-flow model to estimate HWF changes over time.

Supply projections consider:

- Training duration
- Number of practicing professionals
- Average full-time equivalent (FTE)
- Annual attrition rate
- Annual graduate inflow from training programs
- Annual inflow of foreign-trained professionals

Demand projections rely on demographic data, scenarios, and expert input, including:

- Current unmet demand for the profession
- Patient population size and growth
- Yearly percentage change in time spent by Health Care Professional per patient

Demand variables have limitations, as some are subjective and not always based on scientific data; for example, time spent with patients often depends on expert judgement rather than empirical measurement.

Gap Analysis

This tool facilitates the identification of disparities between projected workforce supply and anticipated demand, enabling analysis of how adjustments to key variables influence the magnitude of this gap over time. By systematically modifying factors such as student intake levels, recruitment of internationally trained professionals, retention strategies, or the integration of technology including AI to enhance productivity and reduce patient time requirements, the tool supports the evaluation of targeted interventions designed to mitigate the supply–demand imbalance.

Policy Use of Models

By applying a stock-and-flow method, the Ministry for Health & Active Ageing can forecast workforce supply and demand over time. This approach moves past simple headcount planning and instead focuses on the specific competencies required for safe and effective service delivery, treating staffing ratios as guidelines rather than strict goals. It also allows for meaningful discussions about training pathways, job redesign, and how services are organized, with input from stakeholders like educational institutions and clinical leaders to ensure accurate data and shared responsibility. These conversations have shaped strategies for task-shifting and staff development, backed by targeted education, certification, and other workforce initiatives.

Evaluation of Models

Continuous evaluation not only ensures the tool's ongoing relevance but also enables the proactive identification of new workforce trends and gaps, fostering innovation in health service delivery. As the health sector evolves, flexibility in model assumptions and forecasting logic will be essential to accommodate emerging care pathways, technological advances, and shifting population health needs.

By embedding a culture of learning and adaptation within the workforce planning process, Malta's health system can remain resilient, responsive, and strategically positioned to meet future challenges while maintaining a high standard of care.

The tool is evaluated by regularly reviewing and validating it in meetings with service heads. These discussions offer practical feedback about workforce demands, evolving services, and new skill requirements, which are then used to revise the model's assumptions, variables, and scenarios. This process keeps the model up-to-date, reliable, and aligned with both operational needs and policy goals.

Updates and Future

The Ministry for Health and Active Ageing will sustain ongoing communication and close collaboration with NIVEL to continually refine and enhance the tool. This iterative approach guarantees that the tool stays practical, robust, and relevant by focusing on the most important variables.

Modifications will be guided by real-world insights gathered from using the HWF tool in various settings, allowing lessons learned to drive future improvements. Additionally, structured, continuous feedback from key stakeholders will be pivotal, ensuring their viewpoints, needs, and expertise are consistently integrated. By maintaining this adaptive and collaborative process, the tool will progressively evolve to further strengthen its validity, usability, and overall effectiveness.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

The future direction for Health Workforce planning focuses on building upon and maintaining the governance frameworks, technical expertise, and capacities developed through the HEROES Joint Action and its related policy dialogues.

To promote sustainability, HWF planning and forecasting will become an official responsibility within the Director's role in the People Management Division. This step integrates workforce planning into essential governance processes, guaranteeing lasting leadership commitment, accountability, and continuity after the project concludes.

Following the completion of HEROES, the existing Health Workforce Project Implementation Team will be reformed as a permanent Health Workforce Planning Team under the Ministry for Health and Active Ageing. This new team will take charge of ongoing tasks such as updating, managing, and putting into practice workforce planning and forecasting ensuring that the success and momentum from the Joint Action are maintained.

Partnership with the NIVEL Institute will continue to play a key role by supporting the ongoing improvement and local adaptation of planning methods. Continuous collaboration with the WHO Regional Office will also guide strategic priorities, offer technical support, and ensure alignment with best practices and global standards.

Recognizing the importance of organized, multi-sectoral partnerships, regular bi-annual meetings will be set up with stakeholder groups like educational bodies, employment agencies, Identity Malta, and regulatory authorities. These gatherings will encourage open communication, monitor progress, and enable timely action on new workforce issues.

In addition, a multi-stakeholder think tank led by the Director General for People Management within the MHA will serve as a central hub for strategic discussions, helping to prevent isolated decision-making. Ongoing investment in building workforce planning skills will continue through routine training sessions for HR managers and service heads.

Lastly, continued reliance on and periodic updates to the NIVEL workforce planning model for all health professions will allow for data-driven, adaptable workforce strategies to meet the needs of a dynamic health system.

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COUNTRY REPORT THE NETHERLANDS



6.6 COUNTRY REPORT: THE NETHERLANDS

Introduction

National HWF Planning System before HEROES

Health workforce (HWF) planning in the Netherlands is characterized by a structured governance framework with defined roles and responsibilities distributed across ministries, advisory bodies, research institutes and stakeholders. The Ministry of Health, Welfare and Sport (MoH) is responsible for decisions on the budget for training inflows for (post)graduate health professionals, while the Ministry of Education allocates funding to educational institutions, including medical schools and vocational healthcare programs. A central role in HWF planning is played by the Advisory Committee on Health Workforce Planning (ACHWP), an independent advisory body established in 1999. Every three years, the ACHWP advises the MoH on the required national training inflow for approximately 80 health professions, including medical and dental professions and selected nursing professions. The HWF planning is based on data collection, carried out by a range of specialized actors, including Statistics Netherlands (CBS), research institutes such as Nivel and universities, social insurance and pension funds, health insurers and professional associations. The planning process is based on a participatory stakeholder analysis. This participatory stakeholder analysis consists of expert sessions that are organized to gather substantive, qualitative data on future developments and professional associations, employers, training institutes and health insurers participate in the planning process. They are members of profession specific “chambers”, in which the major steps and outcomes of the planning process are discussed. The meetings of these chambers are prepared and coordinated by the ACHWP. In addition to the work of ACHWP, there is another planning program, the Health and Care Labor Market Monitor (AZW), financed by the MoH, which monitors developments in the healthcare labor market focusing on the other professions and providing contextual information on supply and demand trends. The Netherlands participated in the previous joint action on health workforce planning (SEPEN,2021) as well as in the SEPEN project.

The Dutch HWF planning system is the result of a gradual development process, beginning with the establishment of baseline-quantitative data on supply and demand and progressively moving towards more advanced and strategic workforce planning. Statistics Netherlands is the main provider of demographic and labor market data, including population statistics by age, sex, region and socio-economic status, as well as long-term population projections. Supply data on health professionals registered under the Healthcare Professionals Act (Wet BIG) are derived from registration data collected by the Central Information Point for Healthcare Professions (CIBG) and include information on age, sex, profession, and specialization. For health professionals not registered under the Healthcare Professionals Act, estimates are mostly based on membership data from professional associations as well as quality registers. Other data is derived from registries of health insurers, patient information portals and questionnaires. Additional inputs relevant for workforce planning include pension fund data from the main healthcare pension funds (PFZW and SPH), national vacancy and unemployment data collected through employer surveys, and migration data on inflows and outflows of health professionals compiled by Statistics Netherlands and registration bodies. Educational data on enrolment, dropout rates, training duration, and graduation are mainly provided by educational institutions, funding bodies, and national administrative agencies such as the education services division of the Ministry of Education (DUO).

Building on this data infrastructure, the next phase focuses on selecting and operationalising key variables that describe health workforce dynamics. Demand side data and variables combine demographic projections with healthcare utilization data from health insurers (Vektis), electronic patient records in primary care (Nivel registries), and epidemiological data on disease prevalence and incidence from the National Institute for Public Health and the Environment (RIVM) and regional public health services (GGD). These data are combined, integrated, and interpreted by the ACHWP providing a national needs-based estimation with a long-term horizon. As the baseline matures, the next phase starts: the organisation of governance. The coordination and integration of data and assumptions, as well as the positioning of responsibility for the workforce estimates, are organised through the ACHWP. Governance arrangements clarify who produces the estimates, how stakeholders are involved, and how results feed into policy processes.

In the final, more advanced and strategic phase, quantitative projections are complemented by structured expert sessions with stakeholders. These sessions focus on non-demographic developments such as organization of care, working process, technological innovation, skill mix and substitution, professional developments, and policy measures. By integrating these expert insights, health workforce planning moves beyond technical projection and supports long-term, strategic decision-making.

The primary output of the Dutch HWF planning system is a periodic national advice on training inflow for different health professions, which is used by the MoH to make (financial driven) decisions on education capacity. The planning model focuses on long-term balance between supply and demand, considering training durations and time lags. Furthermore, through the involvement of the Netherlands in JA HEROES we benefited from enhanced access to shared methodologies, planning tools and collaborative platforms that strengthened national health workforce planning capacity and supported evidence-informed decision-making.

Despite the availability of extensive data and established planning processes, several challenges were already identified prior to the JA. These include uncertainties about future developments, shortages of professionals, the difficulty in aligning healthcare needs, demand and service utilisation with the required health workforce, and delays in the availability of registry and statistical data. Data based on the past are not always good predictors of the future, especially when the health care system is changing rapidly. Estimating unmet demand at the start of the planning period remains challenging due to limited and valid or reliable sensitive indicators on vacancies and waiting lists. Furthermore, most HWF data are available only at aggregated level, as availability of individual-level data is constrained by data protection regulations. Systematic and comparable data at the level of healthcare providers and employers are limited and mainly collected on a pilot basis. Finally, HWF planning is predominantly organized at national level and by single occupations, while data and models on regional labor markets, multiple occupations and skills or competencies are not structurally incorporated in the existing system.

HEROES: Key Achievements

During HEROES (2023-2025), The Netherlands successfully achieved the following key milestones in strengthening its health workforce planning system:

- **2023: Strengthening the data foundation for HWF planning**
At the start of HEROES, the Netherlands already had well-established and high-quality data systems for HWF planning and clear objectives regarding improvement of HWF planning. Through HEROES, targeted action points were defined, including collaboration with other countries to progress or refine regional planning, skill-mix planning and demand modelling. In parallel, access to data was already enhanced by aligning data extractions with Statistics Netherlands and medical specialty registries. This ensured consistency, transparency and validation of datasets, forming a stronger and more reliable evidence base for future workforce planning and policy advice.
- **2024: Advancing demand modelling and policy quantification**
In collaboration with the ACHWP, demand modelling was identified as the most urgent development area. A new approach was introduced to better quantify policy choices and visualize policy scenarios within the national planning model. HEROES stimulated discussions with other countries on how to translate policy ambitions into measurable workforce impacts and to make use of policy scenarios. These changes marked a shift from student inflow intake planning towards a broader, policy-oriented HWF planning approach which supports strategic decision-making. This was also a subject of exchange with other countries.
- **2025: Refinement of the national planning model**
The Dutch planning model was further refined to include multiple policy levels beyond training volumes. Outputs, graphs and scenario presentations were redesigned, allowing policymakers to compare alternative policy pathways more clearly. This modernisation shows a structural improvement in how workforce scenarios are communicated and used. The first official ACHWP reports based on this renewed modelling approach were published by the end of 2025.
- **2025: Policy Dialogues to improve cross sector collaboration**
Two national Policy Dialogues (May and November 2025) contributed to improving coordination between Dutch experts and stakeholders. The second dialogue focused on workforce planning for elderly care and informal care, revealing that while substantial data exist, they are fragmented across organisations. As a result, HEROES triggered ambitions regarding concrete follow-up actions, including improving data coordination, data collection initiatives and strengthening collaboration between modelling experts.
- **2026: Building skills and capacity**
HEROES was an opportunity for brainstorming on structured training for workforce planners at Nivel and the ACHWP. Priority topics included core and advanced competencies for HWF planning, stakeholder collaboration and technical model development. In parallel, the Netherlands played a central role in mutual learning by supporting other countries through bilateral exchanges, workshops and study visits. This combination of skills development and international learning strengthens the long-term sustainability and impact of Dutch HWF planning systems.

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

Over the past three years of HEROES, the Netherlands has gained important insights into HWF planning in different countries through a process of learning and exchange. A key lesson from the adoption phase was the value of mutual learning across countries. By supporting other countries and engaging in dialogues about different approaches, it became clear that health workforce issues are similar, but solutions are highly context dependent. This exchange did not only strengthen national reflection but also contributed to a broader European understanding of HWF planning as a shared learning community. HEROES increased awareness that collaboration should focus less on copying models and more on learning from each other's experiences, capacities, governance structures, and institutional settings.

During implementation and upscaling, an important insight emerged concerning the role and design of HWF planning models. The Dutch model is relatively complex and reflects many years of development, data availability, and policy choices. Through HEROES, it became clear that such a model is not easily transferable to other countries, nor always necessary as a starting point. Other countries showed that a more basic model, using only a few key variables, can already provide meaningful insights. Even simple tools can help policymakers better understand health workforce dynamics and the potential impact of policy choices. At the same time, HEROES showed that the effectiveness of any model depends not only on its technical design, but also on its governance arrangements and the institutional positioning of the body conducting the planning, including its mandate. This has led to a shift in perspective: from focusing on model complexity to focusing on accessibility and usefulness for decision-making. HEROES has therefore strengthened the awareness that effective HWF planning starts with building understanding and capacity, rather than with technical complexity.

Country level report based on the Sustainable Workforce Intelligence Planning Systems Framework

Domain 1: Political and contextual support

The Dutch healthcare system is organised as a mixed public–private system with national regulation and a role for private and not-for-profit providers. Healthcare is financed through mandatory health insurance, with competing private insurers operating under a regulated market framework. The Ministry of Health, Welfare and Sport (MoH) sets the overall policy framework, defines benefit packages and regulates access to healthcare professions, while healthcare delivery is largely decentralised and provided by a wide range of public, private and non-profit organisations. Healthcare policy and regulation are predominantly organised at national level. Stakeholders and field parties are involved in the development of policies by use of healthcare agreements. The MoH makes agreements with stakeholders and field parties in the healthcare sector to keep healthcare accessible, of good quality, and affordable. Health care service is mainly delivered across regions and sectors, resulting in regional variation in healthcare demand, service use and health workforce distribution.

Health workforce planning is embedded within this national policy framework and is closely linked to education and labour market regulation. Decisions on the training inflow for regulated (post)graduate health professions are taken at national level by the MoH and Ministry of Education (MoE), based on periodic advice from the Advisory Committee on Health Workforce Planning (ACHWP). Funding for education and training is shared between the MoH and the MoE. At the same time, multiple actors contribute to the evidence base for HWF planning, including Statistics Netherlands, research institutes such as Nivel, health insurers, pension funds, professional associations and educational institutions. This multi-actor setting reflects the complexity of the healthcare system and requires coordination between policy domains such as health, education, social domain, labour and social security, and municipalities.

While HWF planning by the ACHWP and decisions on training inflow by the ministries are coordinated at national level, regional variations in healthcare delivery and labour market conditions are addressed mainly through monitoring rather than through formal regional planning mechanisms. As a result, the Dutch HWF planning system operates within a context that combines national policy authority with decentralised healthcare provision with strong stakeholder engagement, influencing the scope as well as the process of HWF planning.

Domain 2: Human Resources for Health (HRH) governance

HWF planning in the Netherlands is embedded within national government structures. The governance is nationally coordinated but involves multiple actors. The Ministry of Health, Welfare and Sport holds overall political responsibility, including deciding the budget for training places for medical specialists and specialist nurses. The MoE responsible for funding educational institutions including medical schools for basic medical training. The central planning body is the ACHWP which advises MoH and MoE on required national training inflows for healthcare professions. The Health and Care Labour Market Monitor (ABF) monitors workforce trends across all health sectors. Planning relies on national data, scenario development, and structured consultation across government, research institutes, and professional organisations.

Name of stakeholder (grouped)	Involvement	DATA		PROCESS AND TOOLS		SKILLS	
		I	P	I	P	I	P
Academia	Already involved	H	L	H	H	L	L
Governmental Agencies	Already involved	H	H	H	H	H	H
Health Professional Associations	Already involved	H	L	L	L	H	L
Ministries	Already involved	H	H	H	L	H	H
Social Insurance Funds	Already involved	H	H	L	L	L	L
Statistics / Research Institutes	Already involved	H	L	H	L	H	H
Other	Already involved	H	H	H	L	H	L

MoH and MoE are responsible for policy, budget allocation, and educational funding, giving them high authority and the ability to influence outcomes directly. The ACHWP functions as the central planning body, coordinating data collection, scenario modelling, and consultation of stakeholders and experts. Research institutes and universities (Nivel, RIVM, ABF/AZW, ROA, SEO, Tilburg university, Radboud university) provide analytical and methodological support, developing models, and evaluating scenarios. Professional associations and sector organizations (KNMG, V&VN, LHV, SBOH, FWG, PFZW, ZIN, RegioPlus) participate actively in consultations, sharing their perspective and contributing to workforce data, and sector knowledge. Pension funds and insurers contribute to quantitative data for monitoring supply, demand, and employment trends. Regional authorities and local actors are included mainly through monitoring, reflecting a system where decision-making, evidence generation, and stakeholder engagement are distributed.

Domain 3: HWF planners' capabilities

From plan to training activities, skills and competency gains during HEROES

In the Netherlands technical skills include analyzing and interpreting data, integrating multiple sources, and using planning models and software to generate forecasts and scenarios. These skills are used for exploring workforce supply and demand, assessing the effects of retirement and inflow of students, and understanding the potential impact of policy decisions. Alongside technical abilities, health workforce planning requires strong collaboration, stakeholder engagement, contextual knowledge, and clear communication. These soft skills help ensure that planning efforts are communicated effectively, clearly understood, and accepted by various stakeholders such as ministries, research institutes, professional associations, and sector organizations.

To improve the skills of health workforce planners during HEROES, a knowledge exchange workshop was organized as a training activity. The in-person conference took place in Utrecht and brought together 29 participants working with health workforce planning. Four external experts were invited to share perspective on labor shortages from beyond the healthcare sector: an expert from SEOR Research Institute for Labor Market and Employment / Social and Economic Council of the Netherlands, the Research Centre for Education and the Labor Market, Maastricht University, a Professor of Labor Relations, University of Amsterdam, and from the Netherlands Organization for Applied Scientific Research. Their presentations highlighted key factors impacting labor shortages, including career choices of young people, the link between education and labor market demand, the importance of staff retention, and the potential role of technological innovation.

The workshop helped participants get insight into essential skills relevant to health workforce planning. First, it strengthened skills to enable smoother knowledge exchange across sectors and disciplines, by exposing planners to insights from labor market research, economics, and technology. Second, it enhanced participants' ability to analyze and discuss recent labor market trends and developments, and to reflect on their implications for health workforce planning. Third, the discussions supported policy-oriented thinking, encouraging participants to reflect on possible responses to labor shortages, such as retention strategies and broader labor market effects. Finally, the interactive format (including reflections from designated respondents working in health workforce planning) helped develop networking skills and professional collaboration, creating connections between participants and invited experts. In the future, the Netherlands want to use the expert group to hold more of such discussions.

Domain 4: HWF data and models

HWF Data: Sources

Several sources for data collection are used in the Netherlands. The main providers of data are Statistics Netherlands and the Dutch registration the Healthcare Professionals Act (wet BIG). But other sources such as data from governmental and professional registries, educational institutes, professional associations, health insurers and questionnaires are used as well. Data for the supply is mostly based on these data sources. For the demand, data from statistics Netherlands is used for the demographic projections. Other demand factors are mainly based on qualitative data from experts.

Advanced Minimum Data Set: achievements under HEROES

Quantitative data set	Supply side					Demand side	
	Labour force	Training	Retirement	Outflow migration	Inflow migration	Population	Health consumption
Profession	X	X	X	X	X	X	X
Age	X	X	X	X	X	X	X
Head count	X	X	X	X	X	X	X
FTE	X						
Geographical area	X	X	X	X	X	X	X
Specialization	X	X	X	X	X		
Country of first qualification	X	X	X	X	X		
Gender	X					X	X

During the JA HEROES several sources of data have been improved. However, these improvements were realised by the ACHWP independently of HEROES.

For the demand side of the model mostly qualitative data from expert focus group is used. Changes made in the format of the focus group were aligned with the changes in the approach to scenarios in the model. Previously, experts were asked to provide an estimation for 7 different demand trends, which were overlapping with each other. This is why the expert groups discuss all the possible trends with their impact in the near future and give one total estimation of the combined effect of all these trends, instead of 7 estimations. This way they are less likely to overestimate the total effect of the separate trends. This change in the collection of qualitative data was also made by the ACHWP during the duration of HEROES but was not directly related to HEROES.

HWF Data: HEROES contributions and future directions

Policy Dialogues were dedicated to the discussions about regional and skill mix planning and the data needed for this. One of the conclusions was that the most needed data is available in the Netherlands but that the data is scattered across several organisations and there are some gaps in access and that other datasets could complement the data set. One of the actions from the Policy Dialogue was to make an overview of all the available data and the accessibility of the data to find out what is lacking and which datasets should be made available first. This process will be ongoing in 2026 with a focus on data from health insurance and registration data of the health workforce.

HWF Planning Models: design, application and HEROES contribution to HWF Planning Models

The Dutch planning model was developed in the 1990's by Nivel and the ACHWP. The main goal of the model was to provide the MoH with an advice on the number of training quota for the different medical specialist professions to ensure matching the workforce with needs and safeguard funds for training from the Ministry of Health. The training for medical specialists is organized nationally and therefore the model was developed as a national model, which defines quotas of student places financed by public funds. Currently these professions include: all physicians, nurse specialists, physician assistants, psychologists and specialised nurses. For the specialised nurses a modified version of the model was developed in which the number of training spots per hospital are calculated.

For the supply side a stock-and-flow model is used using the number of available FTE.

For the demand side two types of scenarios are currently projected. A demographic scenario in which only demographic changes are considered and a 'complete demand' scenario in which demographic and other trends are considered. The other trends are mainly based on expert consultation and scenario workshops in which different stakeholders are asked which trends are occurring in the coming 20 years that will influence the demand for the different professionals. Next to the two main scenarios, so called 'what if' scenarios can be calculated based on more uncertain developments.

The gap between workforce demand and supply is primarily assessed using vacancy rates. For most professions however, the actual level of demand is unknown in the Netherlands due to the absence of clear staffing norms. Therefore, vacancy rates of hard to fulfil posts are mostly used. Alternatively expert consultations or consultations of employers feed into projections. The future gap between demand and supply is defined by the model by confronting the projected supply and demand. However, the base of this is that the current difference between demand and supply is as accurate as possible as the current status influences the projections for the future.

The model was designed to support training inflow regulation. Due to current demographic changes (e.g. an ageing population), training inflow is not always sufficient to address shortages as there are not always enough students to fill quotas. Therefore, different scenarios are calculated to show the possible effect of other policies, e.g. increasing the pension age, increase of working hours and lowering of the retention rates. Policies currently do not build on these scenarios. In the past only the increase of the pension age was used.

The model provides single occupation planning. Occasionally two professions are planned simultaneously, for instance the dentists and oral hygienists as these two professions are strongly related to each other. Task-shifting is considered at the demand side of the model, but to limited extent, for example only for dentists and oral hygienists, and the professions within mental health care not linked between the different occupations.

There is an evaluation cycle for the model. The model is evaluated every 3-5 years either internally or externally, providing recommendations for improvements of the model. Overall, the model is evaluated as a strong model that gives good projections of the future, given that the right data is used. Recent suggestions for improvement pointed at innovations related to integration of a skill-mix at sector level. This innovation was suggested to get more insight in effects of possible policies to reduce shortages in different sectors within health care.

HWF Planning Models: HEROES contribution and future directions

In 2025 the projection for all the professions and related reports for the Ministry were delivered. In 2026 and 2027 there will be more room for innovation of the model and more focus on the work towards regional planning and planning of multiple professions or skill mix.

Another achievement in 2025 was exploring a new approach with a set of scenarios, which fed into estimates presented in tables and figures for two main scenarios, a demography and full demand scenario. This gives the basis for building 'what if' scenarios testing various policy actions.

In 2025 the ACHWP also set up a 'Think tank' to reflect on the refinement of the planning model. Further developments based on the results of the Think tank will be followed in the coming years.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

The sustainability of HEROES in the Netherlands will focus on strengthening the expert group and improving access to key data sources. Over the course of HEROES, the expert group has become a central, actively used platform for health workforce planning, with members engaging and enthusiastically sharing insights and aligning planning across different levels. To maintain this momentum, the group will continue to meet regularly, and exchange informally, ensuring the network remains active and effective beyond the life of HEROES.

This will support evidence-based decision-making and a better understanding of workforce needs, including regional variations, including trends in informal care. By combining a well-utilized, engaged expert group with reliable, accessible data, the Netherlands will sustain a coordinated and data-driven health workforce planning system whilst preserving the collaborative spirit developed during HEROES.

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COUNTRY REPORT

SLOVAKIA



6.7 COUNTRY REPORT: SLOVAKIA

Introduction

National HWF Planning System before HEROES

Prior to the HEROES project, Slovakia did not operate a fully established health workforce planning and forecasting system. However, some elements of the basic planning existed, particularly in the form of minimum staffing and service coverage requirements introduced in 2008. For inpatient care, a national hospital staffing normative defined ratios of physicians and nurses per bed based on the type of healthcare service provided. In outpatient care, a “Minimal network of healthcare providers” identified the minimum number and geographic distribution of general practitioners and selected specialists required to ensure coverage across the country. While these instruments formally defined minimum capacity thresholds, they remained static and were not adjusted for demographic change, regional care needs, or evolving service delivery models. As a result, Slovakia entered HEROES with some principles for assessing the demand for healthcare already in place, but without a dynamic or evidence-based framework.

Responsibility for setting these norms rested with the Ministry of Health (MoH), which exercised oversight but lacked mechanisms to enforce compliance or update requirements of the necessary databases. The ministry used limited internal demographic modelling, primarily focused on estimating replacement demand within health and care workforce. This was primarily used to provide feedback to budgeting and wage-setting negotiations. It however did not quantify unmet need or identify specific labour shortages. In the absence of such tools, the MoH and the National Centre for Health Information (NCZI) periodically requested providers and regional authorities to report workforce gaps. These data collections were conducted in 2013, 2019 and 2023. They produced useful snapshots, but were ad-hoc, depended on voluntary reporting and not integrated into a systematic planning cycle.

NCZI is the central institution responsible for collecting and managing HWF data at national level. It gathers and processes information from multiple public sources, including ministries, supervisory bodies and health insurance companies, and operates core national digital health infrastructures. The National Registry of Healthcare Workers (NRHW) serves as the primary dataset, containing detailed records on professional qualifications, employment relationships and licencing. However, full compliance is limited to physicians, whose access to the e-health system depends on registry enrolment. For most non-physician groups such as nurses, midwives, assistant staff coverage remains incomplete, largely due to inconsistent reporting by providers. NCZI is actively assessing reporting compliance to address these gaps.

Additional sources help partially compensate for missing data. Annual MOX reports, are yearly reports gathered by NCZI that contain information from individual providers on workforce inflows and outflows, including retirements and maternity leaves, although participation is incomplete and the reporting partially duplicates the NRHW. Regional authorities maintain an outpatient Full-Time Equivalent (FTE) database for physicians, and the education sector offers

aggregated data on student numbers. Migration, retention and mobility statistics are weak, and Slovakia often relies on external research for insight into cross-border workforce movements.

In outpatient care, “minimal network” models estimate unmet demand for selected medical specialties at municipal or district level and are regularly updated. Inpatient demand model evaluates whether hospitals meet type of care minimum standards. No models currently provide long-term forecasting or scenario planning, and most non-physician professions remain outside quantitative analysis due to poor supply data.

Stakeholder engagement concentrated primarily on the Ministry of Health, NCZI, health providers, universities and professional chambers. Their shared priority prior to HEROES was to improve data completeness and reliability. Health workforce planning skills and responsibilities were distributed across multiple institutions, with limited coordination, variable analytic capacity and reliance on basic spreadsheet tools. Retention, career pathways and strategic workforce management were not systematically addressed, and no dedicated governance structure existed to steer comprehensive HWF planning reforms.

HEROES: Key Achievements

During JA HEROES (2023–2025), Slovakia has successfully achieved the following milestones:

- **2023 – 2024: Access to the appropriate output format of the National Registry of Healthcare Workers (NRHW)**

We achieved structured and systematic access to the appropriate output format of the National Registry of Healthcare Workers (NRHW). Given Slovakia’s long-standing lack of data granularity, where available information on healthcare workforce has been limited to aggregated annual reports with insufficient detail to analyse workforce migration, retention, and other key indicators, this represented a significant improvement. Unlike aggregated data, the newly defined outputs are based on data on individual healthcare workers, which gets regularly updated. We designed a standardized structure for NRHW data outputs to be obtained biannually from the National Centre for Healthcare Information (NCZI).
- **2024 – 2025: Model of Minimum Staffing Standards for Nurses, Practical Nurses, and Healthcare Assistants in Hospital Care**

Over the past year at the Ministry of Health, we developed an analytical tool to calculate minimum hospital staffing levels per occupied bed across individual hospital departments. The model enables evidence-based policy decisions on updating outdated minimum staffing standards by calculating the required numbers of registered nurses, practical nurses, and healthcare assistants for a given bed occupancy, while simultaneously incorporating actual FTE in each profession and department. This allows for a precise estimation of current staffing capacities, projected health and care workforce needs under different staffing scenarios, and the associated financial costs of each proposed variant of changes to the minimum staffing norms.
- **2025 - 2026: National strategy for Healthcare Workforce Planning**

Last year we successfully advanced the development of the National Strategy for Healthcare Workforce (HWF) Planning, which provides a comprehensive analytical mapping of all major groups of healthcare professionals within the health sector and proposes targeted measures to stabilize and address shortages in critical healthcare professions. We also succeeded in positioning the strategy for formal government endorsement as a national strategic framework by mid-2026, ensuring that all relevant stakeholders commit to its implementation and long-term objectives.

- **2025 – 2026 : Healthcare Workforce Planning Models**

Last year, Slovakia developed new analytical models to estimate both replacement demand (to cover retirements and exits) and expansion demand (to meet growing and changing service needs) for the health workforce. These models significantly improved the capacity to project future staffing needs across professions and regions, and to translate strategic objectives into concrete numerical requirements for health workers. With the support of the contractor Trexima, Slovakia managed to link its NCZI reporting data on healthcare providers and activities with ISCP data from the Ministry of Labour on actually employed health workers. This integration enabled a much more accurate and granular picture of the structure and employment of health professionals in Slovakia. Both datasets complement each other, meaning data gaps identified in one can be remedied by the other. Therefore, it helps to provide a robust evidence base for health workforce planning and policy-making.

- **2025 – 2026: Integration of National Registry of Healthcare Workers Data into the Hospital Network Optimisation Evaluation Framework**

We also successfully linked data from the National Registry of Healthcare Workers (NRHW) to the evaluation framework of the Optimisation of the Hospital Network. Hospital ranking depends on their ability to meet prescribed quality standards, including the availability of appropriate equipment and qualified professional staff. This initiative ensures that NRHW data are systematically used to assess the staffing component of quality requirements, with health workforce data being provided directly and reliably from the national registry, while simultaneously creating a strong incentive for healthcare providers to accurately and consistently fill up the registry.

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

Over the past three years of HEROES one of the most important lessons learned at country level has been that effective health workforce planning and forecasting system cannot be developed in isolation.

During the adoption phase, this became particularly evident while drafting the National Strategy for Healthcare Workforce Planning. The strategy was developed in close cooperation with several sections of the Ministry of Health, including the education section, the nursing section, and other relevant departments, which provided valuable insights into the functioning of the healthcare system and healthcare workforce. Subsequently, the draft strategy was circulated twice for formal consultation among a wide range of external organisations, including universities, healthcare sector associations, regional authorities, and professional chambers. This process significantly increased awareness that HWF planning is a shared responsibility across governance levels and professional domains, and that legitimacy and acceptance of new policies depend on transparent and inclusive processes rather than on top-down decisions alone.

During the implementation phase, similar lessons emerged from the development of the Model of Minimum Staffing Standards for Nurses, Practical Nurses, and Healthcare Assistants in Hospital Care. Engagement with personnel officers, head nurses and heads of human resources in hospitals provided highly valuable insights into how staffing systems function in practice, highlighting gaps between formal regulations and operational realities. These experiences reinforced several core lessons learned during HEROES: (1) each stakeholder understands their own area best, and involving them early provides essential insights for designing effective policies, (2) open dialogue and collaboration across different areas of expertise lead to more realistic and sustainable outcomes, and (3) many stakeholders and professionals in the healthcare sector are genuinely willing to contribute to policy change when given the opportunity.

Another important lesson learned during the development of the Healthcare Workforce Planning Model was the clear need to apply workforce planning not only at the national level, but also at the regional level. Significant differences between regions in terms of health workforce availability, service demand, and system capacity showed that a single national model cannot adequately capture local realities. Equally important was the recognition that planning must be based on the current state of the system, including existing workforce shortages, overtime work, compliance with minimum staffing standards, waiting times, and other indicators of pressure, rather than relying solely on an assumed ideal or normative situation. Incorporating these real-world constraints into the model proved essential for producing realistic forecasts and for designing policies that can effectively respond to actual needs across different regions.

Across all phases, the need to secure strong leadership support from the Ministry of Health emerged as a critical enabling factor. High-level endorsement proved essential for engaging all relevant departments within the Ministry of Health and for convincing external stakeholders that healthcare workforce planning, monitoring workforce developments, and stabilising human resources must be treated as a core priority within the healthcare system.

Country level report based on the Sustainable Workforce Intelligence Planning Systems Framework

Domain 1: Political and contextual support

Slovakia operates a universal healthcare system based on mandatory health insurance, with almost the entire population covered through three public health insurance companies. Care is delivered by a mix of public, state-owned and private providers, although the Ministry of Health maintains stewardship over policy development, regulation and service standards. The system is nationally governed, yet service delivery and provider operation are highly decentralised, with hospitals managed by state, regional governments or private entities. Outpatient care^[16] is predominantly private contract based, with general practitioners and specialists contracted directly by insurers rather than employed by the state. This mixed environment means that health workforce availability is influenced by both national policies and the behaviour of individual providers. This fragmentation is also reflected in the data availability as smaller practices are less likely to update the databases frequently.

This governance setup has a direct impact on health workforce planning. While the Ministry of Health sets regulatory requirements and minimum service coverage standards, workforce availability depends on the decisions of hospitals, outpatient practices and contracting insurers. As a result, the state does not have full operational control over workforce deployment, recruitment or retention. Any planning exercise must therefore reconcile differing incentives between actors, including public hospitals dealing with fixed budgets, private outpatient doctors balancing workload and practice viability, and insurers contracting services based on reimbursement rules rather than health workforce capacity.

The national character of policymaking combined with decentralised delivery requires coordination across multiple layers of stakeholders. These include healthcare providers, healthcare insurance providers, professional chambers, schools, universities and unions. Regional differences in age structure, population density and provider composition create workforce pressures that are in some cases very unevenly distributed. This can be seen on the Public Optimal Network for General Outpatient Care, published by the Office for Healthcare Supervision^[17] on a yearly basis making a uniform national approach insufficient without territorial nuance. As a result, effective health workforce planning in Slovakia depends on aligning national regulatory tools with local service realities and strengthening mechanisms to involve providers, regional authorities and professional groups in data collection, interpretation and decision-making.

Domain 2: Human Resources for Health (HRH) governance

The main governance body responsible for health workforce planning in Slovakia is the Ministry of Health of the Slovak Republic. There is currently no dedicated organisational unit or institute exclusively responsible for health workforce planning and forecasting model, which has been identified as a structural weakness of the system. HRH-related responsibilities are distributed across several departments and institutions. This fragmented governance structure has historically limited the capacity for systematic, long-term health workforce planning and monitoring.

Stakeholder landscape: roles, power, and interests in HWF Planning

At the analytical level, a key role is played by the Institute of Health Analyses (IZA), which serves as the main analytical body of the Ministry of Health. IZA has been the primary unit dealing with workforce-related analyses and has closely cooperated on the development of the National Strategy for Healthcare Workforce Planning. The institute was responsible for developing the Model of Minimum Staffing Standards for Inpatient Care and co-developed the Healthcare Workforce Planning Model. Professional workforce agendas are further divided by profession. For example, nursing and other non-medical healthcare professions fall under the responsibility of the Department of Nursing and Other Healthcare Professions (Odbor ošetrovateľstva a iných zdravotníckych profesií), while physicians are primarily covered by the Department of Healthcare Provision (Odbor zdravotnej starostlivosti). These two departments, with methodological and analytical support from IZA and its existing Model of Minimum Staffing Standards for Inpatient Care, are currently preparing a new proposal for updated Minimum Staffing Standards for Inpatient Care. In the outpatient sector, the Department of Outpatient Healthcare Strategy (Oddelenie stratégie ambulantnej zdravotnej starostlivosti) developed the “optimal network” model for outpatient care. Education of healthcare professionals and the planning of their future supply falls under the responsibility of the Department of Healthcare Education within the Ministry of Health of the Slovak Republic. This department oversees healthcare education, including the number of graduates and newly admitted students and trainees in healthcare study and training programs. Based on analytical inputs and data provided by the Institute of Health Analyses (IZA), the department also determines the number of available positions for residency training, directly influencing the entry of new healthcare professionals into the system.

In connection with the adoption of the National Strategy, discussions are ongoing about establishing a dedicated unit within the Ministry of Health that would focus on healthcare workforce planning, implementation of the strategy, and systematic monitoring of workforce developments.

An important institutional stakeholder is also the National Health Information Centre (NCZI), which is the main data provider to the Ministry of Health and supplies almost all key administrative and registry data needed for workforce planning and forecasting. Other stakeholders include schools and universities, which usually decide independently how many new places to open for students in healthcare study programs. However, the Ministry of Health can mandate an increase in the capacity of study programs if needed. Universities also provide postgraduate education, including specialised training and continuous professional development for doctors and nurses. The Centre for Scientific and Technical Information of the Slovak Republic then gathers information about students in every school and university and publishes yearly reports on how many students completed and entered which programs/schools. Finally, the Office for Healthcare Supervision is responsible for the annual evaluation of the optimal network model for outpatient care and provides ID codes to doctors and de-registers them upon death.

Name of stakeholder (grouped)	Type of stakeholder	Involvement	DATA		PROCESS		SKILLS	
			I	P	I	P	I	P
MoH - Institute of Health Analyses	Ministry	involved	H	H	H	H	H	H
MoH - Department of Nursing and Other Healthcare Professions	Ministry	involved	L	L	H	H	H	L
MoH - Department of Healthcare Provision	Ministry	Not really involved	L	L	L	H	L	H
MoH - Department of Outpatient Healthcare Strategy	Ministry	Not really involved	H	H	H	H	H	L
National centre for Healthcare information	Public Health Institute	Not involved	H	H	H	H	L	L
Office for the Health Care Supervision	Governmental Agency	Not really involved	H	H	L	L	L	L
MoH - Department of Healthcare Education	Ministry	Involved	H	L	L	L	H	L
The Centre for Scientific and Technical Information	Governmental Agency	Not involved	H	H	L	L	L	L
Universities and schools	Public institutions	Not involved	L	H	H	H	H	L
Slovak medical chamber	Society	Not involved	H	H	H	H	H	H
Slovak chamber of nurses	Society	Not involved	H	H	H	L	H	L
Slovak chamber of other healthcare professionals	Society	Not involved	H	H	H	L	H	L
Association of state-owned hospitals	Society	Not involved	H	H	H	H	H	L
Association of hospitals of the Slovak republic	Society	Not involved	H	H	H	H	H	L

Besides the main healthcare workforce planners, there are also other stakeholders that play a crucial role in providing data and participating in negotiations on healthcare workforce policy changes. Chambers of healthcare professionals maintain registers of healthcare workers, and every regulated healthcare profession should be registered there. They are legally required to be included in the register. However, in practice not all professionals comply with this obligation, so the register does not capture every single healthcare worker in the system. In addition, associations of hospitals hold important data on healthcare personnel employed in hospitals, which further complements the overall picture of the healthcare workforce.

Domain 3: HWF planners' capabilities

The central actor in the healthcare workforce (HWF) planning process in Slovakia is the Ministry of Health, which holds the overall responsibility for strategic workforce planning. The operational execution of the health workforce planning process is carried out by the Institute of Healthcare Analyses. While several other institutions contribute essential inputs to the process, the responsibility for conducting the full planning exercise remains exclusively with the Ministry of Health. This centralized setup is primarily driven by data eligibility and access arrangements. Only the Ministry of Health has direct access to the full set of datasets required to run the integrated healthcare workforce planning model. Other institutions participate by providing specific components that feed into the model but do not conduct planning activities themselves. For instance, the National Health Information Centre (NCZI) supplies detailed data on the health workforce, including distribution and demographic characteristics. Similarly, the Healthcare Surveillance Authority is responsible for calculating demand gaps for specific years, based on a methodology defined by the Ministry of Health in 2023. These calculations represent an important analytical input, but they do not constitute workforce planning as such, since neither the authority nor NCZI have access to the complete data infrastructure required to operate the full model.

Within this framework, the work on the health workforce planning and forecasting model requires close and continuous communication between the Institute of Healthcare Analyses and NCZI. This cooperation is particularly important in relation to the planned future use of the National Registry of Healthcare Workers, which is currently not fully suitable for direct application in the planning model. Ongoing dialogue between data providers and planners therefore plays a key role in aligning data structures, improving data quality, and gradually enabling the broader use of administrative registries for health workforce planning purposes.

Healthcare workforce planning in Slovakia relies on several interrelated layers of capabilities. The first layer concerns the governance responsibility, which currently rests solely with the Ministry of Health due to its regulatory role and data governance responsibilities. The second layer consists of technical and analytical skills. The planning model is implemented in Python and structured into several interdependent modules that must be configured and executed coherently to ensure the integrity of the model outputs. This requires a solid command of programming in Python[18], as well as a strong understanding of statistical methods, given that both supply and demand projections are based on statistical forecasting techniques with defined methodological assumptions. In addition, the modelling of healthcare demand draws on demographic and epidemiological datasets provided by NCZI. In order to correctly integrate these datasets, HWF planners must be proficient in constructing complex SQL[19] queries and possess an in-depth understanding of the NCZI database structure. As access to these databases is limited to Ministry staff, this technical expertise is closely linked to institutional arrangements. Beyond technical execution, planners also require a thorough conceptual understanding of the overall model architecture, including the role of individual modules, the sequencing of inputs, and the interpretation of outputs.

Alongside technical competency healthcare workforce planning also requires coordination and communication capabilities. Planners need to engage with data providers, policy units, and other stakeholders to ensure that model assumptions and outputs are well understood and aligned with policy objectives. These interaction skills support the translation of analytical results into strategic decisions and contribute to the effective use of evidence in workforce policy development. To support continuity and institutional memory, the Institute of Healthcare Analyses is developing a comprehensive methodological framework that documents the structure, assumptions, and operational steps of the planning model. This approach aims to ensure the usability and sustainability of the planning process over time, particularly in light of staff turnover, which represents a common organizational challenge across public institutions.

From plan to training activities, skills and competency gains during HEROES

During the HEROES, Capacity-Building activities focused primarily on strengthening the technical capabilities of the analysts directly involved in HWF planning. As the model was developed in cooperation with an external partner - TREXIMA[20], two analysts of the Institute of Healthcare Analyses participated in a series of six dedicated training sessions organized by a representant of the external contractor. These sessions provided detailed explanations of all model modules and their interactions, alongside structured feedback discussions from the analysts that allowed for adjustments to inputs and assumptions.

The initial sessions were conducted online with the aim to provide an overview of the model's concept and operational principles. Subsequent sessions were held in person to test the model's functionality, facilitate the handover process, provide practical training on its use and discuss the improvements/practical use of the model. This iterative approach reflects the expectation that the model will continue to evolve and improve as new data become available and planning needs develop. The training activities contributed to consolidating the analysts' ability to operate, maintain, and further develop the healthcare workforce planning model.

Importantly, the outputs of the model are already informing policy discussions, as they are actively shaping the National Strategy for the Stabilisation of Healthcare Workers, which has recently undergone inter-ministerial review. The strategy is expected to be advanced to parliamentary negotiations in 2026, highlighting the growing role of evidence-based planning in national health workforce policy. The parallel development of detailed methodological documentation ensures that the knowledge acquired during these trainings can be transferred to new analysts in the future, thereby supporting the long-term sustainability of healthcare workforce planning capacities within the Ministry of Health beyond the lifetime of the HEROES.

Domain 4: HWF data and models

HWF Data: Sources

Advanced Minimum Data Set: achievements under HEROES

The new healthcare workforce planning model relies on a wide range of administrative and analytical data sources, the majority of which are held by the Ministry of Health and its subordinate institutions. On the supply side, the core dataset consists of annual workforce reports produced by the NCZI, which provide aggregated information on professionally active healthcare workers by sector and geographical location. These data are further supplemented by the ISCP dataset, administered by the Ministry of Labour and Social Affairs. The integration of ISCP data ensures sufficient coverage of FTE and more importantly serves as a validation mechanism for the NCZI dataset, as missing records in one source can be identified and complemented using the other. This cross-validated dataset is the building stone of the HWF model as both supply and demand modelling is based on it.

Demand-side data are derived from several institutional sources and require the integration of multiple analytical inputs. The baseline demand for healthcare services is established through the calculation of current workforce deficits, based on the Minimal Network of Healthcare Providers, hospital staffing normatives (staff to patient ratios), overtime work and waiting lists, of which the maximum is considered. The revised hospital normative tool, which is not yet live was modelled as a part of the HEROES initiative, and the model developed is currently being considered as a tool for setting the new bed-normative for the entire inpatient care for nurses. The waiting lists and minimal network of providers were developed independently, not as a part of HEROES initiative, but utilized by HWF planners from the Institute of healthcare analyses. The Minimal Network is calculated annually by the Healthcare Surveillance Authority, while additional demand-related inputs are collected internally by the Ministry of Health or provided by healthcare insurance companies and NCZI on behalf of the Ministry. Beyond the baseline year, the model distinguishes between expansion of demand and replacement demand for HWF. The expansion of demand is estimated using epidemiological data from NCZI, based on the expected changes in hospitalisation rates, length of stays and outpatient visits with respect to their future distribution across population groups. In other words, it answers the question of “by how much, when and where” is the demand for healthcare services going to change. On the other hand, the replacement demand is modelled separately using age-specific workforce data, capturing retirements and workforce exits. The integration of these datasets allows the model to project the equilibrium between supply and demand over a time horizon of up to 15 years. Together, they provide key inputs into the strategic planning for Slovak Healthcare.

HWF Data: improvements

During HEROES, substantial improvements were achieved in terms of data availability, robustness and methodological consistency. On the supply side, the linkage of NCZI workforce data with ISCP records represented a major advancement, as it both validated existing data and expanded analytical possibilities. Access to ISCP data enabled the inclusion of previously unavailable information on retirement patterns by specialisation and geographical area, as well as analyses of workforce inflow and outflow, including migration. On the side of demand, a structured methodology for projecting healthcare consumption was developed for both outpatient and inpatient care. It is important to note, that this advancement did not rely on access to new datasets but rather on the systematic utilisation of existing NCZI data. The standardisation of input databases and the direct extraction of data from live epidemiological databases maintained by NCZI significantly increased data granularity and timeliness, moving beyond reliance on aggregated annual reports. All these changes can be considered as a major update with respect to the starting minimal dataset from the first phase of the project.

Qualitative data is used to a lesser extent as opposed to the start of the project, as it was applied mainly as a proxy in the absence of quantitative data. This was particularly done in relation to migration, workforce ageing, fluctuation, workforce supply deficits, demand assumptions and work organisation. As quantitative data coverage in these areas has improved, the role of qualitative inputs has been streamlined. However, the distribution of work still plays a major role in the demand setting of our models. For example, the new hospital normative model works on a set of assumptions that were directly consulted with HR specialists in individual hospitals. Due to these recent advancements, the main role of qualitative data is mainly to help the planners interpret and validate different scenarios. Financial and budgetary considerations are already incorporated into the analytical framework, allowing the estimation of future workforce needs to be translated into projected cost implications for the healthcare system.

HWF Data: HEROES contributions and future directions

Future development of the HWF data infrastructure will focus on broadening available data sources and improving data quality. Key priorities include the integration of administrative data from the Social Insurance Company on actual employment, remuneration, and working time of healthcare workers, the inclusion of healthcare professionals employed in the social care sector from the Ministry of Labour, Social care and Family, and ensuring more complete reporting to the National Register of Healthcare Workers and the NCZI M01 reporting system. These improvements will provide a more comprehensive and reliable evidence base for healthcare workforce planning and policymaking.

HWF Planning Models: design, application and HEROES contribution to HWF Planning Models

Slovakia currently operates three main health workforce (HWF) planning models, with a fourth under development. These tools support national and regional planning across professions and sectors.

- **Model 1: Public Optimal Network for General Outpatient Care**

This model was made operational since 2022 (pre-HEROES) by the Department of Outpatient Healthcare Strategy (Ministry of Health), with annual evaluation by the Healthcare Surveillance Authority (ÚDZS) and results published by July 31 each year. It addresses shortages of general practitioners and primary paediatricians at district level driven by low numbers of general practitioners and primary paediatricians, high average age of doctors, absence of incentives for generational turnover, low attractiveness of general practice, and low percentage of medical graduates choosing this specialization, issues stemming from decades of insufficient priority for primary care development and financing. Supply is projected using number of clinics/doctors from E-VÚC portal (private portal supported by regional authorities and Ministry of Health), where one clinic equals 35 weekly office hours plus nurse capacity index adjustment, also considering doctors' age and share aged 63+. Demand is based on insured persons count, their age, and internal migration by area. Current gaps are calculated as number of missing clinics (1 clinic = 35 hours), optimal capacity fill rate, and share of doctors 63+ years. Future gaps use district risk classification with financial grants to most deficient areas. This model therefore supports training inflow regulation through recruitment grants and addresses low GP attractiveness and generational turnover.

- **Model 2: Replacement Demand Model**

Replacement Demand Model was developed in 2025 by Trexima contractor and the Institute for Health Analyses under the Ministry of Health mandate to map healthcare workforce and propose stabilization measures for the national strategy. Development and optimization of the model is still ongoing. It covers all significant healthcare professions across ambulatory, inpatient, and other care sectors nationally/at regional level. Replacement demand quantifies workforce needed to replace exits due to retirement, long-term sick leave, migration, or other interruptions. The model uses a number of graduates from CVTI SR, ISCP data from Ministry of Labour, and M01 reports from NCZI in a stock-and-flow model based on physical persons.

- **Model 3: Expansion Demand Model**

The Expansion Demand Model was also developed in 2025 by Trexima and IZA, and its development and optimization continues. The model identifies additional workforce needs beyond replacement for strategy development. It applies to all major professions in ambulatory, inpatient, and other sectors nationally/at regional level. Expansion demand assumes current resources insufficient for healthcare needs, projecting future structures by population/regions, hospitalization rates by diagnosis/department/region/age, ambulatory visits, and hospitalization lengths. Data sources include ISCP (Ministry of Labour), M01 reports (NCZI), hospitalizations/ambulatory visits (NCZI database via IZA), and demographic data/processes (Statistical Office SR). It uses FTE basis unlike replacement model's persons basis. It also takes into consideration current gaps which include staffing norms, outpatient networks, overtime (exceeding contracted hours as mismatch indicator), waiting lists for hospitalization, and expert estimates. A simplified version of the scheme of the expansion model is attached below, and individual modules of the model are described in the attachments.

- **Model 4: Specialized Outpatient Care Network (under development)**

Currently operates a functional gynecology network with the structure similar to the Public Optimal Network for General Outpatient Care. It is planned in 2026 to continuously expand and to cover all medical specializations in ambulatory care at national and district levels.

HWF Planning Models: HEROES contribution and future directions

Regarding the models and tools for HWF planning, our future plans include completing and refining the Model 2 (Replacement Demand Model), revising and improving the Model 3 (Expansion Demand Model), and expanding the Model 4 (Specialized Outpatient Care Network) to all specializations, building on the operational gynecology network.

In the future, Slovakia plans to conduct yearly estimations of health workforce (HWF) demand and supply using integrated models that account for demographics, regional disparities, and other key factors. The models and methodologies will undergo regular revisions, including comparisons of forecasted values against actual employment data to improve planning capacities and achieve the most accurate results. A detailed methodology for HWF planning will be documented to ensure that the acquired knowledge and tools continue to be systematically used beyond the HEROES project.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

As mentioned earlier, Slovakia's sustainability plan for health workforce (HWF) planning emphasizes continuous improvement of planning models. Building on HEROES achievements, future work will focus on completing the Replacement Demand Model, refining the Expansion Demand Model across its 13 modules, and expanding the Specialized Outpatient Care Network to all specializations.

Within the Ministry of Health's strategy framework, plans include establishing a dedicated HWF unit responsible for human resources in healthcare. This unit will form a working group of key sector stakeholders for regular policy dialogues to discuss national strategy development and workforce planning, ensuring policy continuity beyond political cycles by positioning the strategy as a living document and platform. Demand models will be run on a regular basis, and their results and HWF trends will be discussed at meetings with stakeholders together with measures resulting from the strategy. Based on the data from the model and the latest HWF trends, we will revise the effectiveness of the measures from the strategy and decide whether to proceed with them or propose/discuss new measures to stabilise healthcare workforce development.

Additional national strategy actions aim to access new data sources on healthcare worker migration, job vacancies, shortages, and related metrics to strengthen planning accuracy. We will try to maximize the completion rates of the National Registry of Healthcare Workers through its successful and continuous integration into the Hospital Network Optimisation Evaluation Framework.

Annual demand/supply estimations, model revisions comparing forecasts to actual data, and detailed methodology documentation will institutionalize these tools, ensuring long-term use for regional, demographic-driven HWF policies. If further EU-level initiatives in the field of health workforce planning are launched, Slovakia would be ready to actively participate and contribute, building on the significant progress and capacities developed during the HEROES Joint Action.

ATTACHMENTS: DETAILED MODULES OF THE EXPANSION AND REPLACEMENT DEMAND MODEL

1. **Module 1 - Consolidation of ISCP and M01 Data:**

As already mentioned in the previous text, the fundamental source of information on employment in healthcare professions is the linked ISCP and M01 datasets. Their linkage is not a straightforward matter due to discrepancies in the variables surveyed, different survey periodicity, as well as the timeframe for data collection and publication. Module No. 1 ensures the acquisition of necessary employment information in the required quality, timeliness, and granularity. Thanks to this linkage, it is possible to have healthcare employment data significantly earlier than just from the M01 report, include healthcare professions in companies that are not in the M01 sample, and work with variables that individual surveys do not contain (e.g., exit from employment by specific age, gender, region, occupation, department, or studied field of education for working persons) which are essential for the model.

2. **Module 2 – Current Mismatch in Professions:**

The goal of Module 2 is to identify the current shortage in healthcare professions. Currently, it includes data on bed norms (preliminary estimates), worked hours compared to average, waiting times for surgery (partial implementation), and minimum network of healthcare providers. Since these are data expressing partially the same problem, they cannot be considered additively. The current mismatch for a given profession (and in a given region) then incorporates the maximum level of shortage from the examined variables. The module is prepared for expansion with additional indicators of current shortage (which need to be developed and exactly defined – as also stated in the recommendations). This module also implements foreign scenarios (allowing comparison with any country including outside the EU, but in the study primarily analyzing EU, Czechia, Austria, Germany), expressing the required increase in healthcare personnel by individual professions so that their number per thousand inhabitants is identical to the compared country in SR conditions.

3. **Module 3 – Demographic Development and Forecast:**

Module 3 prepares historical data and forecasts of demographic data to 2040 for the population by age, gender, and individual districts. Module 3 is prepared for potential future implementation of its own demographic forecasting model; currently, however, existing current demographic forecasts based on existing models were used.

4. **Module 4 – Preparation of Hospitalization Data:**

The number of hospitalizations is one of the key demand indicators in inpatient healthcare and is therefore an important part of the model. This is a preparatory module preparing historical data on hospitalizations by diagnoses, specialties (departments), regions, and age of inhabitants. Based on these data in connection with historical demographic data from Module 3, hospitalization rates and average hospitalization lengths of persons by age, region, diagnoses, and specialty (including historical development) are calculated.

5. **Module 5 – Static Forecast of Demand in Inpatient Care:**

The goal of Module 5 is to identify changes in demand for healthcare performance to 2040 "purely" due to future demographic changes. The population forecast by age and region from Module 3 for the period 2025-2040 is applied with the current hospitalization rate (by age, region, diagnosis, and department), thereby identifying the future number of hospitalizations in all these breakdowns, on which the current average length of hospitalization (in corresponding breakdowns) is then applied, and the total expected number of hospitalization days in 2025-2040 is calculated. Subsequently, year-on-year changes in the total number of hospitalization days by regions, diagnoses, and departments are identified (which will ultimately be transformed into changes in human resource needs by healthcare professions). The results of the module represent the isolated

impact of demographics on changes in demand in inpatient healthcare care (since we assume current/static hospitalization rates by age and average hospitalization length).

6. **Module 6 – Dynamic Forecast of Changes in Demand in Inpatient Healthcare Including Changes in Demographics and Hospitalization Rates:**

Module 5 applied static hospitalization rates and average number of hospitalization days to the dynamic demographic forecast to 2040. Module 6 extends these results and simultaneously dynamizes the hospitalization rates as well. First, historical hospitalization rates are calculated by variables as in the previous module (region, age, diagnosis, department). Since data from 2020-2023 are significantly influenced by the COVID-19 pandemic, the module simultaneously contains methodology to remove cyclical development in hospitalization rates in the 2020-2023 period. These adjusted hospitalization rates are then forecasted to 2040 in all breakdowns using various types of models depending on what historical data are available. The forecasts of hospitalization rates are finally further adjusted and bounded to meet relevant assumptions (year-on-year growth of the rate cannot exceed the set minimum and maximum bounds, cannot be negative, etc.). These hospitalization rate forecasts are then applied both with static demography and static hospitalization length (to determine the isolated impact of changes in hospitalization rates on total demand in inpatient healthcare), but also on projected demography with static number of hospitalization days (the result of which is the change in demand due to changes in demographics and hospitalization rates).

7. **Module 7 – Dynamic Forecast of Total Change in Demand in Inpatient Healthcare:**

Module 7 extends Modules 5 and 6 by dynamizing the average hospitalization length by region, age, diagnosis, and department, which it then applies to the dynamic forecast of demography and hospitalization rate. The result is thus the total expected change in demand in inpatient healthcare to 2040 based on changes in demographics, hospitalization rates, and hospitalization length. Similarly, as in Module 6, also when dynamizing (respectively forecasting) the average number of hospitalization days in individual breakdowns, time series are first cleaned of cyclical development due to the pandemic, and only then forecasts are proceeded according to various models depending on the structure of historical data. Similarly as with hospitalization rates, also in this case the final forecasts are systematically adjusted to meet the set assumptions (maximum, minimum year-on-year growths/values).

8. **Module 8 – Consolidation Module of Expansion Demand for Human Resources in Inpatient Care:**

Module 8 combines the results of previous modules and transforms future changes in demand in inpatient healthcare into human resource needs. In the first step, current disparities identified from Module 2 are applied to current employment data by healthcare professions (in regions). This ensures that the current starting value of employment is at the level of the defined optimum. These values are then applied with the expected growths in demand for inpatient healthcare defined in Modules 5-7 (at individual departments and regions). The result is the total expansion demand in inpatient healthcare in the period 2024-2040 at the level of professions (including medical specializations) and regions.

9. **Module 9 – Expansion Demand for Outpatient Healthcare:**

Module 9 forecasts changes in demand in outpatient healthcare at the level of districts, diagnoses, and departments. In the first step, historical visit rates in outpatient care (by age, districts, and specialty) are calculated. These are similarly as in previous modules cleaned of pandemic influence, forecasted for 2025-2040, adjusted to meet required conditions, and applied to the demographic forecast from Module 3. Expected visit growths at the level of specialties, diagnoses, and districts represent the expected growth in demand for outpatient healthcare.

10. **Module 10 – Consolidation Module of Expansion Demand for Human Resources in Outpatient Care:**

Module 10 first applies the current mismatch (Module 2) to the current level of employment by professions and districts in outpatient healthcare, thereby ensuring an "optimal" current state of human resources. These numbers are then applied with expected growths in demand for outpatient healthcare from Module 9, and identified expansion needs for human resources in outpatient healthcare by regions and professions (including doctors' specializations).

11. **Module 11 – Consolidation Module of Expansion Demand for Human Resources in Healthcare:**

Module 11 combines the results of expansion demand in outpatient healthcare (Module 10) and inpatient healthcare (Module 8) and simultaneously supplements the expansion demand in other facilities outside inpatient and outpatient care (approx. 10% of employment in healthcare). By combining all the mentioned parts, total expansion needs for human resources in healthcare in 2025-2040 are defined by specific professions, regions, and form of healthcare provision (Outpatient, Inpatient, Other facilities).

12. **Module 12 – Replacement Demand in Healthcare:**

Module 12 estimates the expected number of persons leaving the labor market from healthcare professions mainly into old-age pension. In the first step, exit rates from the labor market by individual professions, age, region, and gender are estimated, and these are then applied to current and future employment structures in healthcare. The exit rate is calculated based on data from Module 1 as the number of persons (FTE) leaving in individual breakdowns (age, gender, region, form of healthcare provision, profession) and not returning to healthcare in SR in the same year (to exclude normal fluctuation/ transfers between different healthcare facilities) to the total number of employees (FTE) in those breakdowns. This currently ensures inclusion not only of exit into old-age pension but also exit from the labor market for other reasons (e.g., death). By applying these probabilities to the current employment structure, we get the number of leavers and the future employment structure in the following year, on which we again apply probabilities and continue until 2040. The result is replacement demand for human resources in healthcare by healthcare professions (including doctors' specializations) in individual regions by form of healthcare provision.

13. **Module 13 – Graduates Entering the Labor Market:**

Module 13 forecasts the number of persons who will enter the labor market in the future from the education system and will thus represent the main potential to meet future labor market needs. Forecasts are made at the level of specific fields of secondary schools and universities in 2025-2040. The forecasted number of graduates entering the labor market is the number of graduates adjusted for those continuing studies. Transition rates of persons between years, levels of education are defined based on historical rates.

8. FOOTNOTES

[1] In the Belgian context, the concept of a “practice registry” does not refer to a single standalone database, but rather to the identification of actively practising health professionals through administrative sources, primarily RIZIV/INAMI reimbursement data. This approach allows distinguishing between licensed professionals and those effectively delivering care, which is essential for accurate health workforce planning.

[2] Be.well.pro is a national survey initiative coordinated by the Federal Public Service Health and implemented by Sciensano to monitor the work-related mental well-being of health and social care professionals in Belgium over time (Sciensano, 2025).

[3] Headcounts refer to the number of individuals in the workforce, without accounting for their actual working time or activity level.

[4] Art. 99 of the law of 10 May 2015 provides for the possibility of linking register data with a series of other databases.

[5] As at 30 June 2023

[6] Czech Statistical Office 2022

[7] Current prices and PPPs; OECD 2022

[8] OECD 2022

[9] Power BI is a tool that allows users to connect to different data sources, analyse the data, and create interactive visual reports. It helps to see trends, problems, and important insights in the data.

[10] Czech Republic health system information and resources

Health insurance system in CZ - KZP

[11] The interval between the 4th and 6th deciles defines a 'representative standard' of healthcare production. By focusing on this narrow band around the median, the model establishes a benchmark based on realistic, sustainable workloads observed in the field, rather than theoretical ideals or extreme efficiency peaks

[12] GIS - geographic information system (GIS) consists of integrated computer hardware and software that store, manage, analyze, edit, output, and visualize geographic data

[13] A singular person responsible for maintaining and updating the three developed models.

[14] The ESF-funded project “Non-Technical Skills for Healthcare Personnel (ESF02:052)” (2019–June 2023), with a budget of €3.63 million, aimed to improve teamwork, communication, and inclusive, patient-centred care across the health service. It promoted safe practice, quality, and respect for patient dignity. The project delivered 4,397 training sessions to 4,971 participants (82.42% completion), reaching 3,901 unique learners, and provided over 1,500 hours of leadership coaching.

[15] Jobsplus is Malta’s public employment and training agency responsible for supporting jobseekers, facilitating recruitment, and enhancing workforce skills to meet labour market needs.

[16] Health or care services delivered without an overnight stay in a facility, including consultations, day cases, diagnostic tests, treatments and follow-up visits.

[17] available at: <https://www.udzs-sk.sk/urad/udaje-o-vyhodnoteni-sieti-poskytovatelov-ambulantnej-starostlivosti-podla-zakona-c-578-2004-z-z/>

[18] Python is a high-level, general-purpose programming language widely used for data analysis, modelling and scientific computing.

[19] SQL (Structured Query Language) is a standard programming language used for managing and querying relational databases.

[20] Trexima is a research, statistical and consulting company established in 1992, specialising in labour market analysis, including wage research, employment, human resource management and productivity.



D7.1 Report on countries' data collection, HWF planning models and tools, planning skills improvement and stakeholders' involvement: Belgium, Czechia, Estonia, Germany, Malta, the Netherlands and Slovakia



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