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HEROES

D5.1 Report on countries' data collection, HWF planning models and tools, planning skills improvement and stakeholders' involvement: Greece, Ireland, Italy, Norway, Portugal, Spain and Sweden

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ABSTRACT

This report presents the consolidated results of Work Package 5 (WP5) of the HEROES Joint Action, analyzing Health Workforce (HWF) planning systems in seven European countries: Greece, Ireland, Italy, Norway, Portugal, Spain and Sweden. Using a common qualitative and comparative methodology, the analysis is structured around the HEROES Sustainability Framework, which covers four key dimensions: political and contextual support, Human Resources for Health (HRH) governance, HWF planners' capabilities, and HWF data and models.

The findings show that HWF planning across participating countries is increasingly recognized as a strategic governance function essential to health system performance, resilience, and long-term sustainability. HEROES has acted as a catalyst by strengthening governance arrangements, improving data infrastructures and analytical tools, enhancing planners' skills and fostering cross-country cooperation. Despite this progress, challenges remain, including data fragmentation, limited demand-driven analysis, and uneven integration of planning outputs into routine policy and decision-making processes.

Overall, the report highlights the added value of EU-level cooperation in promoting more coherent, forward-looking and evidence-informed approaches to HWF 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This deliverable contains original unpublished work except where clearly indicated otherwise.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..

DISCLAIMER

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HEROES

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1.EXECUTIVE SUMMARY

This report presents the consolidated results of Work Package 5 (WP5) of the Joint Action HEROES, which aimed to strengthen the sustainability, institutionalization and policy relevance of HWF planning systems across participating European countries. The analysis covers seven countries **(Greece, Ireland, Italy, Norway, Portugal, Spain and Sweden),** which operate predominantly publicly funded health systems, yet differ significantly in governance structures, degrees of decentralization and levels of system maturity.

Objectives and scope

WP5 assessed national HWF planning systems through a common analytical lens, focusing on four interrelated sustainability dimensions defined in the HEROES framework: **(1) Political and contextual support, (2) Human Resources for Health (HRH) governance, (3) HWF planners' capabilities, and (4) HWF data and models.**

The overarching objective was to identify strengths, gaps and emerging trajectories, to draw transferable lessons, and to support countries in moving from fragmented or project-based planning towards more institutionalized, strategic and evidence-informed approaches.

Methodology

The report is based on a **comparative qualitative methodology,** grounded in the Sustainability Framework. National country reports were prepared using a common template and informed by multiple data sources, including policy documents, planning outputs, national action plans, and HEROES activities such as policy dialogues and capacity-building initiatives. An iterative validation process with national stakeholders ensures consistency while respecting country-specific contexts. Key methodological limitations include data heterogeneity, uneven analytical maturity across countries, reliance on qualitative inputs, and the time-limited nature of the Joint Action.

Key comparative findings

Across all WP5 countries, HWF planning is undergoing a strategic transition. HWF is increasingly recognized as a central pilar to every health system performance, resilience and sustainability, rather than as purely an operational concern. HEROES has acted as a catalyst in this shift by increasing political commitment and visibility, strengthening governance arrangements, enhancing analytical capacity, and fostering systematic peer learning. Countries covered by this report demonstrate clearly the added value of HEROES in critical areas:

- Political and contextual support for HWF planning has increased in all countries, although translation into coordinated action varies. Norway and Sweden display more consolidated systems, where HWF planning is embedded in long-term health strategies. Ireland, Italy, Portugal and Spain follow an intermediate trajectory, while Greece represents an emerging model.
- HRH governance has improved notably through HEROES-facilitated policy dialogues, which helped align ministries, regions, professional bodies, and other stakeholders. Nevertheless, fragmented mandates and coordination challenges persist, particularly in decentralized systems.
- Planners' capabilities have been strengthened through training, peer learning, and cross-country exchanges. While technical and analytical skills improved, gaps remain in advanced modelling, demand-driven analysis, and strategic communication, especially at regional and local levels.
- HWF data and models saw substantial progress, including refinement of the Advanced Minimum Data Set (AMDS), digitalization of data systems, and development or upgrading of forecasting tools. However, persistent challenges remain in data fragmentation, limited interoperability, insufficient demand-side modelling, and continued reliance on headcount-based approaches rather than capacity, and skill-based measures.

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COUNTRIES KEY ACHIEVEMENTS

Greece: Establishment of a structured foundation for national HWF planning, including improved coordination between the Ministry of Health and data-producing institutions, towards a more systematic approach.

Ireland: Consolidation of HWF planning as a strategic policy function, with strengthened analytical capacity and clearer links between workforce projections and national health reforms.

Italy: Enhanced coordination between national and regional levels in HWF planning, improving coherence in a highly decentralized system and promoting shared methodologies across regions.

Norway: Full integration of HWF planning into long-term national health strategies, supported by advanced data systems and strong institutional ownership.

Portugal: Strengthening of HWF data governance and analytical tools, some progress in demand-side analysis and alignment between planning outputs and policy decision-making.

Spain: Improved multilevel governance of HWF planning, fostering collaboration between central and autonomous community levels and advancing common planning principles.

Sweden: Development and application of health workforce planning approaches supported by strong data infrastructure, workforce intelligence, and collaborative learning processes.

Conclusions

The analysis demonstrates that **sustainable HWF planning cannot be achieved by improving models alone.** Policy impact depends on the institutionalization of planning functions, strong governance, skilled planners, integrated data systems, and clear links between analytical outputs and decision-making cycles. HEROES has delivered clear EU added value by accelerating reforms, promoting methodological convergence and strengthening cooperation among Member States.

POLICY IMPLICATIONS AND RECOMMENDATIONS

- Institutionalizing HWF planning as a permanent governance function.
- Strengthening integration between data, models, and policy processes.
- Advancing demand-side and capacity-based planning approaches (including FTEs, productivity and skill mix).
- Investing continuously in planners' technical, strategic, and relational skills.
- Reinforcing European cooperation, notably by aligning HWF data initiatives with the European Health Data Space.

Overall, HEROES provides a strong foundation for more resilient, forward-looking and evidence-informed HWF planning across Europe, highlighting the importance of continued EU level support and collaboration.

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2. INTRODUCTION

HEROES as a Catalyst for Strategic HWF Planning

Overall, the findings highlight that, across WP5 countries, HWF planning is gradually evolving from a predominantly technical exercise towards a more strategic governance function. While political awareness and analytical tools have advanced in most countries, important challenges persist, particularly in translating political commitment into coordinated action, institutionalising planning processes, and ensuring that planners' capabilities are sufficiently developed to support evidence-informed decision-making.

HEROES has played a catalytic role by increasing political commitment and visibility, strengthening governance arrangements, investing in planners' capabilities and fostering peer learning, thereby contributing to more coherent, forward-looking and sustainable approaches to HWF planning across Europe.

Health systems are a core driver of competitiveness because they sustain a healthy population and workforce, reduce productivity losses from illness, and enable innovation through high-performing services and data capacity. Improving HWF productivity depends on having the right staff, with the right skills, in the right places. HWF planning is therefore essential as it provides the evidence to anticipate demand, address shortages and "medical deserts", guide training and skills investment, and support reforms that raise efficiency while safeguarding access and quality of care.

HWF planning has become an increasing policy concern across European health systems, as countries face converging structural pressures including population ageing, evolving models of care, persistent workforce shortages and rising expectations regarding access, quality and sustainability of services.

In this context, HWF availability, skills and distribution are no longer viewed as purely operational issues, but as central determinants of health system performance, resilience and reform capacity. Recognising this shift, HEROES has sought to support participating countries in strengthening the sustainability, institutionalisation and policy relevance of HWF planning systems.

This report presents the consolidated outputs of the WP5 Cluster within HEROES and provides a comparative analysis of national HWF planning systems in seven countries: Greece, Ireland, Italy, Norway, Portugal, Spain and Sweden. All operate predominantly publicly funded health systems, characterised by multi-level governance arrangements that require effective coordination across national, regional and sectoral actors. In contrast, these countries represent diverse health system configurations, ranging from highly centralised to strongly decentralised governance models, sharing common challenges related to HWF sustainability, long-term planning and the translation of evidence into policy decisions.

This report complements Deliverable D1.2 *"Final deliverable on HWF planning: data, models and skills",* which presents the overall technical and policy synthesis of the Joint Action HEROES. Whereas the present deliverable focuses on the comparative analysis of the WP5 Cluster countries, D1.2 provides a broader cross-country and cross-cluster perspective across all participating countries, including the main technical findings, comparative analyses, strategic conclusions and policy recommendations emerging from the Joint Action.

The analysis is grounded in the Sustainability Framework developed under WP4 which conceptualises sustainable HWF planning through four interrelated dimensions: (1) political and contextual support; (2) HRH governance; (3) HWF planners' capabilities; and (4) HWF data and models.

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Together, these dimensions capture the structural, institutional, human and analytical conditions required for HWF planning systems to move beyond fragmented, project-based or purely technical approaches. They are closely linked to four core functional tasks underpinning effective workforce planning: data, models, skills and governance/stakeholder engagement.

Within this framework, political and contextual support refers to the prioritization of HWF planning within national policy agendas and its alignment with broader health system reforms. HRH governance concerns the institutional arrangements, coordination mechanisms, and stakeholder involvement necessary to ensure coherent and accountable planning processes. HWF planners' capabilities encompass the technical, analytical, and strategic skills required to translate evidence into policy. HWF data and models address the availability, integration and use of workforce data, as well as the development and application of forecasting tools to inform decision-making.

By applying this analytical framework across the cluster countries, the report examines how national systems have progressed in embedding HWF planning within broader health system strategies, strengthening governance arrangements, developing analytical and human capacity, and improving the integration of data and models into policy cycles. Rather than ranking countries, the comparative approach identifies common patterns, structural differences and emerging trajectories, including indicative clustering of countries according to their relative level of system maturity and institutional consolidation.

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3. METHODOLOGY

This report is based on a comparative, qualitative analytical approach aimed at assessing the development, implementation and sustainability of HWF planning systems across participating countries during the HEROES period. The analysis focuses on identifying common patterns, structural differences and transferable lessons.

This chapter ensures alignment with the Sustainability Framework providing a robust basis for comparing diverse national health systems while maintaining the integrity of country-specific contexts. All country analyses are conducted using the shared analytical framework, ensuring coherence across diverse health system models.

HEROES Sustainability Framework conceptualizes sustainable HWF planning through four interrelated dimensions: (1) political and contextual support; (2) HRH governance; (3) HWF planners' capabilities; and (4) HWF data and models. These dimensions form both the basis of the comparative analysis and the structure of the country reports and are closely linked to the core functional tasks of data, models, skills and governance/stakeholder engagement.

Data collection followed a multi-source qualitative approach. Primary inputs include the national country reports, National Policy Action Plans, sustainability milestones, and outputs from HEROES activities such as policy dialogues. To ensure comparability, all country reports were prepared using a common template and followed an iterative process involving national contributors, WP5 coordination, and technical validation. This process balanced methodological alignment with respect for country-specific interpretations and policy priorities.

The comparative analysis describes findings across the four dimensions of the Sustainability Framework. It focuses on domain-based summaries, identification of cross-cutting challenges and enabling factors, and comparison of different governance and organizational models. Where relevant, indicative clustering of countries is used to reflect different levels of system maturity, without implying normative ranking. The comparative logic is aligned with that used in other WP cluster reports to ensure coherence across HEROES deliverables.

Several limitations should be considered when interpreting the findings, including heterogeneity across countries, where differences in health system structures, governance models, and data availability limit the direct comparability of results.

Other limitations might include (1) variability in methodological maturity, as countries are at different stages of development in terms of data systems and modelling capacity, (2) reliance on qualitative inputs, with much of the analysis based on descriptive and expert-informed information and limited availability of standardized quantitative indicators, (3) limited evaluation evidence, since in several cases planning tools and models have not undergone formal evaluation, constraining the assessment of their effectiveness, and (4) the project-based timeframe, as HEROES is a time-limited initiative, meaning some actions are still under development and their long-term impact cannot yet be fully assessed.

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4. COMPARATIVE ANALYSIS

This section presents a comparative analysis of HWF planning systems across the participating countries, structured around the four domains of the HEROES sustainability framework: (1) political and contextual support, (2) governance, (3) planners' capabilities, and (4) data and models. The analysis aims to identify common patterns, structural differences and emerging trajectories, with a particular focus on factors that enable or constrain the development of sustainable and policy-relevant HWF planning systems. The starting point for the analysis is the countries' reports.

Despite substantial diversity in institutional arrangements, levels of decentralization and technical maturity, convergent patterns are emerging, pointing to a gradual shift of national systems towards more structured, evidence informed and institutionalized approaches to HWF planning.

Domain 1: Political and Contextual Support

Across all seven WP5 countries, HWF planning has assumed greater political prominence in response to shared structural challenges, including population ageing, increasing and changing service demand, workforce shortages and changing models of care. These pressures have reinforced a common understanding that HWF constraints represent a strategic risk to health system performance and sustainability, leading to the increased prioritisation of workforce policy at national level. Whitin this context HEROES provided an important platform for cross-country collaboration, enabling participating countries to accelerate progress through shared learning and collective development.

Despite this convergence in problem recognition, the extent to which political commitment is translated into coordinated and sustained action varies substantially, reflecting differences in governance structures, institutional maturity and levels of decentralisation. In more advanced and consolidated systems, HWF planning is embedded within broader health system strategies and supported by relatively stable institutional mandates. This is most evident in Norway and Sweden, where HWF planning is closely linked to long-term health system planning, underpinned by strong political ownership, well-established data infrastructures and clear connections between analytical outputs and policy decisions at both national and regional levels.

A second group of countries follows an intermediate trajectory, **combining growing political attention with ongoing efforts to strengthen institutionalisation and coordination. Italy, Spain and Portugal illustrate this pattern. HEROES was a cornerstone of this trajectory.** In these contexts, national authorities typically set strategic direction, while implementation is adapted to regional realities within decentralised or mixed governance systems. **HEROES was key to strengthen the political commitment to HWF planning in recent years, reflected in renewed strategic discussions, updated planning frameworks and the gradual strengthening of analytical tools.** However, fragmentation of responsibilities across governance levels continues to challenge coherence and consistency in translating political priorities into action. Ireland also falls within this intermediate group but displays a distinct contextual dynamic. **Having joined the WP5 cluster later, Ireland has used HEROES as a catalyst to consolidate political and institutional consensus around a medium to long-term HWF planning paradigm, positioning HWF planning as a strategic policy function aligned with wider health system reform.**

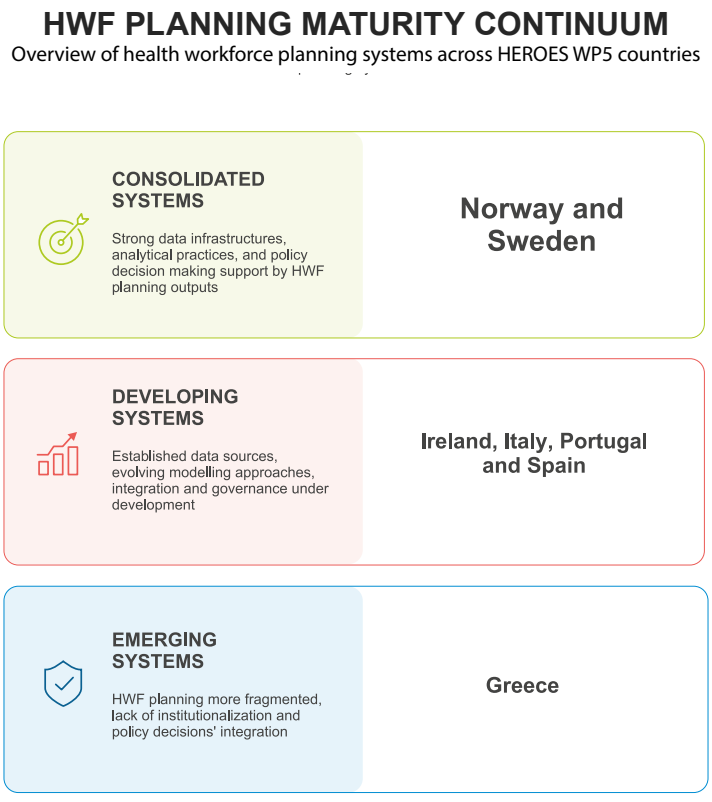
More centralised systems such as Greece face different challenges. While political recognition of workforce sustainability has increased, responsibilities for HWF planning remain dispersed across multiple institutions, and planning processes are still evolving towards greater coordination and institutional anchoring. In these contexts, **translating political commitment into integrated and routine planning practice in Greece remains a key challenge.**

Across all seven countries, a common pattern emerges: growing political awareness of the importance of HWF planning is not yet uniformly matched by stable governance arrangements and fully institutionalised processes. HEROES has contributed to addressing this gap by increasing political visibility and supporting concrete developments, including the modernisation of analytical tools in Portugal, the consolidation of advanced data systems in Norway and Sweden, and the strengthening of strategic planning frameworks in Italy, Spain and Ireland.

Beyond technical progress, HEROES has also supported broader contextual improvements. Countries report enhanced inter ministerial collaboration, particularly with education and finance sectors, and more structured stakeholder engagement through policy dialogue mechanisms. **Together, these developments are contributing to more forward looking, coherent and participatory approaches to HWF planning, strengthening the foundations for long term institutionalisation and resilience beyond HEROES.**

HEROES has established a collaborative platform that enables participating countries to accelerate progress in HWF planning and move faster towards higher levels of maturity and excellence. By fostering systematic peer learning, knowledge exchange and cross-country comparison, HEROES has allowed countries, such as Portugal and Greece, at earlier stages of development to benefit from the experience, tools and methodologies of more advanced systems. This collaborative approach has not only reduced duplication of effort but has also facilitated the dissemination of best practices, supported methodological convergence and strengthened the overall capacity of Member States to design and implement evidence-informed workforce policies.

In summary and based on the comparative analysis, countries can be broadly sorted into three groups: (1) more advanced and consolidated systems, characterized by relatively strong data infrastructures, established analytical practices, and closer links between planning outputs and policy decisions (e.g., Norway and Sweden), (2) intermediate or developing systems, combining established data sources with evolving modelling approaches and ongoing efforts to strengthen integration and governance (e.g., Ireland, Italy, Portugal and Spain) and (3) and emerging or less formalized systems (Greece) where planning remains more fragmented, with limited institutionalization of models and weaker integration into policy processes.



Domain 2: HRH Governance

The comparative analysis of WP5 countries shows that HWF planning across Europe is gradually evolving from fragmented and largely technical approaches toward a more strategic governance function. The Joint Action has been a cornerstone of this trajectory.

Progress appears strongest in countries where planning responsibilities are clearly institutionalised, data systems are integrated, and workforce projections are routinely linked to policy decision-making. Norway and Sweden illustrate this dynamic particularly well, as workforce projections directly inform education planning, service organisation and national HWF strategies.

A key finding is that countries with clear institutional mandates and stable governance arrangements appear better positioned to translate HWF analysis into policy action. Norway and Sweden exemplify this dynamic as integrated national data systems and established planning structures allow workforce projections to routinely support education planning, service organisation and broader national HWF strategies.

Across all WP5 countries, **Policy Dialogues (PD´s) emerged as an effective governance mechanism for aligning technical evidence with political priorities. Countries reported that these processes strengthened coordination between ministries of health, education and finance, regional authorities and professional bodies, while also improving stakeholder ownership of planning reforms. For instance, Portugal, PD´s contributed to reframing HWF planning as a long-term strategic governance function; in Italy and Spain, they supported stronger coordination between national frameworks and regional implementation; while in Greece, PD´s facilitated consensus-building around emerging planning tools and governance responsibilities. Ireland has used PD´s to establish clear governance structures and collaborative mechanisms among multiple stakeholders.**

Investment in planners' capabilities has also increased practical policy relevance of HWF planning through **training and peer learning initiatives under HEROES** which strengthened not only analytical skills, but also countries´ ability to communicate findings and support to decision making processes. Examples include **Italy's national training programme, and Portugal's international course on HWF governance, both of which reinforced technical and strategic competencies among planners. In Ireland, HEROES contributed to strengthening modelling capacity within the Department of Health, while in Greece's national level training and the exploratory application of forecasting tools,** helped to shift planning discussions from descriptive reporting towards more forward-looking analysis.

Despite progress, several structural constraints persist. Data fragmentation remains a major barrier, particularly in decentralised systems such as Spain and Italy, where workforce information is dispersed across regional structures. Portugal and Greece continue to face interoperability and governance challenges linked to fragmented data ownership and uneven system maturity. In Ireland, limited data availability initially restricted modelling scope, requiring progressive expansion of datasets and analytical coverage.

Even where data availability has improved, data and models are often insufficiently integrated, reducing transparency on assumptions and policy implications. Most countries still rely heavily on headcount-based stock–flow models, with limited consideration of full-time equivalents (FTE), productivity, skill mix or new professional roles. Demand-side analysis also remains underdeveloped in several countries. In Portugal and Spain, projections continue to rely heavily on demographic trends rather than systematic links to service utilisation or changing care models, while Greece still face limitations in integrating epidemiological and service delivery data into workforce forecasting approaches.

Overall, findings from WP5 suggest that sustainable HWF planning depends less on increasingly sophisticated modelling alone and more on the institutional capacity to embed evidence into governance and policy processes.

To consolidate and scale the progress achieved under Joint Action HEROES, policymakers should prioritise: (1) institutionalising HWF planning as a permanent governance function with clear mandates and stronger links to policy and budgetary cycles; (2) strengthening the integration of data, modelling and decision-making to ensure projections directly inform choices on training, recruitment, retention and workforce distribution; (3) developing more robust demand-side analysis by incorporating service utilisation, epidemiology and evolving models of care; (4) moving from headcount-based to capacity-based planning approaches that account for FTEs, productivity, skill mix and emerging professional roles; (5) sustaining investment in planners' capabilities by combining technical, systems and communication competencies; and (6) reinforcing European cooperation, including alignment with the European Health Data Space, to improve data interoperability and cross-country comparability.

HEROES demonstrates that sustainable HWF planning is not achieved through better models alone. Its real impact depends on governance, institutionalisation and the ability to translate evidence into strategic policy decisions. Countries that embed HWF planning in routine decision making and invest in people, data and coordination are better positioned to strengthen system resilience and long term sustainability.

Domain 3: HWF Planners' Capabilities

Strengthening the capabilities of HWF planners has emerged as a key enabler of sustainable workforce planning across WP5 countries within HEROES. While governance structures and political commitment provide the necessary framework, effective planning ultimately depends on skilled professionals capable of generating, interpreting and translating evidence into policy decisions. Across WP5 countries, capacity-building has been recognized as a strategic priority, supporting a shift from descriptive reporting towards more structured forecasting and policy-oriented analysis.

Three interconnected layers of competencies have been consistently identified. First, technical and analytical skills are essential, including data management, forecasting methodologies, interpretation of workforce indicators and understanding modelling assumptions. **Norway and Sweden benefited from relatively strong analytical capacity supported by integrated data systems, while Portugal and Italy have strengthened forecasting approaches through supply–demand gap analysis and the development of Business Intelligence tools. However, capacity remains unevenly distributed. In decentralized systems such as Spain and Italy, analytical expertise is often concentrated at central level, with more limited capacity at regional level to conduct local projections. In Greece, the introduction of scenario-based planning approaches has further highlighted the need for continuous training** to ensure that increasingly complex tools are effectively used.

Second, system-level and contextual knowledge is required to interpret projections and translate them into policy. HEROES has been a platform to build bridges between technical expertise and policy makers, while also strengthening capacities through targeted training actions. HEROES has in addition fostered peer learning across countries, enabling the exchange of best practices and accelerating progress through shared experience. Planners must understand health system organization, labour market dynamics, financing structures, education pathways and ongoing service delivery reforms. In practice, this knowledge is often fragmented across institutions. For example, Portugal, Spain and Sweden all underscore the importance of closer coordination between health and education sectors to better align training capacity with workforce needs. However, the governance arrangements through which these processes are implemented differ across countries. In decentralized systems such as Sweden, regional actors play a central role in linking workforce planning to service organisation and local demand, while in Portugal and Spain similar coordination challenges are increasingly being addressed through strengthened regional planning mechanisms.

Third, relational and strategic competencies are critical to ensure that technical analysis informs decision-making. HWF **planning requires stakeholder engagement, negotiation and the effective communication of evidence to policymakers. HEROES activities, including policy dialogues and targeted training initiatives, have supported these competencies.**

For instance, Greece organized national-level training bringing together stakeholders from different administrative levels to develop a shared understanding of planning approaches, while Portugal, Norway and other countries used policy dialogues to strengthen collaboration between ministries, public agencies and professional bodies. However, high staff turnover, particularly at regional level, continues to set challenges to continuity and institutional memory.

HEROES has, through training programmes, bilateral exchanges and peer-learning mechanisms contributed to professionalisation of HWF planning, building on strengthened analytical skills, development of a common technical language, and improved collaboration across sectors. In countries such as Portugal and Italy, this has translated into more systematic use of data in planning processes, while in Norway and Sweden it has reinforced already established analytical practices.

Nevertheless, important gaps remain across WP5 countries, particularly in advanced predictive modelling, integration of financial impact assessment, and long-term skill-mix analysis. Addressing these gaps will require sustained investment in training, stronger institutionalization of the planning function, and reinforced cross-sector collaboration. Ensuring continuity of expertise and embedding these competencies within governance structures will be critical to consolidating progress and supporting more resilient and forward-looking HWF planning systems.

Domain 4: HWF Data and Models

The seven WP5 countries have established and use data systems and forecasting models for HWF planning; however, the level of data integration, analytical maturity and systematic use of data and models for policy relevant planning ranges considerably across countries.

Within WP5, all participating countries have strengthened their HWF data through participation in HEROES, resulting in improved data quality and increased data coverage. All countries have established core data infrastructures, typically combining administrative HR data, professional registries, education data and national statistics. In parallel, workforce planning models have been developed or further refined during HEROES period. In practical planning work, data systems and forecasting models should be closely interconnected, with improved and expanded data directly supporting more robust modelling and analytical outputs.

HEROES contributed significantly to strengthening HWF data infrastructures and forecasting capacity across WP5 countries by supporting greater standardization, interoperability, and analytical development. Across countries, the Joint Action facilitated the transition from fragmented data collection towards more structured approaches to HWF intelligence, enabling data systems and forecasting tools to play a more strategic role in long-term workforce planning.

HEROES provided the framework and resources to modernize planning models through **digital transformation** (e.g. Norway ran a complete migration of the projection model, creating a more robust, transparent, and reproducible system); **innovative visualizations** (e.g. interactive dashboards in the BI system created by Portugal have made complex data more accessible), **new forecasting tools** (e.g. Italy developed a proposal for a new forecasting model specifically for medical specialties, filling a critical gap where previous decisions were based on qualitative negotiations rather than structured data), **strengthening governance and coordination** (e.g. in Spain, HEROES facilitated a national consensus to define essential HWF data, creating a "common language" between national and regional authorities); and **formalized data sharing** (e.g. Ireland motivated the inclusion of a wide range of HWF data in a formalized data sharing governance between the Health Service Executive and Department of Health).

Table - Country Examples of Data Improvements

	Key HWF Data Achievement through HEROES
Greece	Revised the AMDS to clarify core variables and integrated HWF indicators into the HEALTH-IQ digital dashboard.
Ireland	Achieved the inclusion of a wide range of HWF datasets in a formalised data sharing governance between the Health Service Executive (HSE) and Department of Health.
Italy	Developed an integrated statistical system through ISTAT that tracks individualized data across several health professions.
Norway	Migrated workforce projection models to Python and integrated interactive dashboards for better stakeholder access.
Portugal	Created BI_RH_SNS, a business intelligence system that clusters data on workforce trends
Spain	Established a central register of health professionals with automated data flows and national-regional validation mechanisms.
Sweden	Successfully validated the AMDS, showing particularly strong coverage in tracking retirement and migration flows.

A cornerstone of the HEROES project was the refinement and validation of the Advanced Minimum Data Set (AMDS) which ensures that countries collect the right data to support complex modeling, covering both quantitative "stocks and flows" and qualitative "drivers of change".

Examples of progress include the modernization of forecasting infrastructures in Norway, the development of interactive BI tools in Portugal to support evidence accessibility, the creation of specialty-specific forecasting models in Italy, improved national-regional coordination mechanisms in Spain, and the establishment of formalized HWF data governance arrangements in Ireland.

A shared structural challenge across countries is data fragmentation, shaped by governance arrangements. Decentralised or mixed systems (e.g. Spain, Italy, Ireland) face coordination and comparability challenges due to data being held at multiple levels, while Norway and Sweden benefit from more integrated national statistical systems. Greece and Portugal continue to experience structural constraints related to interoperability and institutional fragmentation. **Across all countries, data gaps though smaller, persist beyond physicians and nurses, particularly for allied health professions, private sector, part-time work, dual practice and HWF mobility.**

A central analytical limitation is that data and models are often treated as parallel elements rather than as parts of an integrated planning system. While forecasting tools exist in all countries, it is not always clear how data inputs feed models, how modelli ng outputs inform concrete policy decisions, or where breakdowns occur along the data to decision pathway. Strengthening this integration remains critical for improving the policy relevance of HWF planning.

The lower development of demand side analysis emerges as the most significant crosscutting gap. Most countries continue to rely heavily on demographic proxies and expert judgement to estimate HWF needs, with limited use of workload based, morbidity based or service utilisation driven approaches. This limits the ability of planning systems to adapt to new models of care, to address productivity dynamics and service reconfiguration, representing a structural barrier.

Another major limitation is the continued predominance of headcount-based stock-and-flow models which, although useful for monitoring workforce trends, inadequately capture actual system capacity and service delivery needs. Across countries, there is growing recognition that more policy-relevant planning requires incorporating FTEs, productivity, skill mix, task redistribution and emerging professional roles.

In terms of modelling capacity, countries can be broadly grouped into three categories. Norway and Sweden operate relatively advanced forecasting systems, incorporating demographic trends, retirement rates, education inflows and, in Sweden's case, competency-based approaches to HWF planning. Portugal, Spain, Italy and Ireland are in a phase of progressive development, combining administrative data with forecasting approaches such as supply-demand gap analysis (used in Portugal and Italy) and expanding the use of Business Intelligence tools. Ireland has been strengthening its modelling capacity to better align HWF planning with ongoing health system reforms (e.g. Sláintecare), highlighting the importance of linking projections to healthcare delivery transformation. Greece relies more on scenario-based and ad hoc analyses, reflecting more limited institutionalization of modelling frameworks.

Across all countries, there is increasing recognition that traditional headcount projections are insufficient, with growing efforts to incorporate factors such as skill-mix, productivity and changing models of care.

Table – HWF modelling capacity

Advanced Forecasting Systems (demographic trends, retirement rates, education inflows and competency-based approaches to HWF planning)	**Norway** **Sweden**
Progressive Development (Combining administrative data with forecasting approaches)	**Ireland** **Italy** **Portugal** **Spain**
Scenario-based and ad hoc analyses (Limited institutionalization of modelling frameworks)	**Greece**

Overall, findings from this domain suggest that sustainable HWF intelligence systems depend not only on improved data availability, but also on the integration of data, modelling and governance processes into routine decision-making. Across countries, the main strategic priorities include strengthening demand-side analysis, reducing fragmentation and interoperability barriers, moving beyond headcount-based approaches, expanding coverage beyond physicians and nurses, and institutionalising analytical capacity within permanent governance structures.

KEY MESSAGES

- HWF data and models, if well used, form system, that ensures clear link between data collection, modelling assumptions, outputs and policy decisions.
- Improving demand driven analysis is a strategic priority.
- HEROES contributed to moving HWF planning beyond headcounts (reflecting capacity, productivity, skill mix and emerging professional roles).
- Reducing data fragmentation through governance and interoperability, to enhance national level planning and regional comparability is key.
- Expanding data coverage beyond physicians and nurses is key for cross-professions planning
- Institutionalizing models and analytical capacity: sustainable impact requires stable mandates, long term resourcing and embedding HWF intelligence in regular decision making cycles.

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5. CONCLUSIONS

The comparative analysis of WP5 countries demonstrates that HWF planning in Europe is at a turning point. Across diverse governance models, countries are transitioning from fragmented, technically driven exercises towards more strategic, policy-oriented planning functions. This shift matters because HWF availability, skills and distribution increasingly determine health system resilience, access to care and fiscal sustainability. HWF planning is essential for resilient health systems, which are a core driver of competitiveness.

A key conclusion is that HWF planning delivers most policy value when data, analysis and governance are tightly connected to decision-making cycles. Where planning outputs are embedded in routine policy processes, such as budget preparation, education planning or service reform, countries are better positioned to anticipate shortages, manage transitions in skill mix and avoid reactive, costly interventions. In opposition, where planning remains project-based or analytically isolated, its impact on policy is limited, regardless of technical sophistication.

At the same time, the analysis highlights achievements of HEROES, pointing to clear opportunities for system strengthening. Countries are converging around common priorities: improving interoperability of data systems, institutionalising forecasting models, strengthening governance coordination, and investing in planning skills. National trajectories from embedding HWF planning in budgetary processes to expanding competency-based and demand-oriented approaches illustrate that progress is feasible when reforms are aligned with broader health system objectives.

Persistent systemic weaknesses continue to undermine policy effectiveness. Data fragmentation, incomplete coverage (notably for non-medical professions, private sector activity and mobility), and uneven analytical capacity reduce the usability of planning outputs. For policymakers, this translates into higher uncertainty when making decisions on training capacity, recruitment or redistribution, increasing the risk of misallocation of resources and delayed responses to emerging needs.

The work carried out within WP5 clearly demonstrates that European countries have made substantial progress under HEROES, particularly in the identification, analysis, and transfer of effective planning methodologies and good practices.

WP5 activities have been instrumental in strengthening the evidence base, enabling structured comparison of national approaches, and fostering the dissemination of advanced quantitative and qualitative planning models across Member States. Building on these achievements, HEROES has represented a decisive step forward, consolidating this knowledge into more operational and scalable tools.

HEROES established a successful model of co-operation, which allowed Member States to reach quicker progress than would have been possible through isolated national efforts alone. HEROES elevated the policy importance of HWF planning by placing it firmly on the strategic agenda of Member States and encouraging coordinated action. This work also contributes to setting direction on improvement of HWF data at EU level, aligning all the key actors to join efforts in this area. HEROES partners also consider that European Health Data Space (EHDS) is an opportunity to consolidate efforts for better data and forecasting capacity at EU and national level. In this context, continued EU level support would be essential to further refine methodologies, expand the exchange of best practices, and ensure their systematic uptake. Such continuity would allow Member States to increasingly rely on robust, comparable, and data-driven planning approaches.

Moreover, continuing cooperation at EU level in this area together with the development of the EHDS would be an opportunity to significantly enhance the availability and interoperability of data, paving the way for the creation of a “European HWF Dataspace” capable of supporting more sophisticated modelling and policy decision-making across Europe.

Finally, HEROES has demonstrated that structured cooperation, policy dialogue and peer learning can accelerate reform. By increasing political visibility, standardising analytical approaches and fostering shared understanding across institutions, HEROES has reduced barriers to implementation. Ensuring continuity beyond the project is therefore not only desirable, but necessary to leverage previous investments and support long-term system sustainability.

HEROES has demonstrated a highly effective model of European cooperation, significantly elevating the policy relevance of HWF planning across Member States. By creating structured spaces for policy dialogue, peer learning and cross-country comparison, HEROES has contributed to positioning HWF planning as a strategic governance function, rather than a purely technical exercise.

HEROES has delivered tangible progress which reflect a shift towards more structured, evidence-informed and forward-looking approaches, with clearer links between data, analysis and policy decision-making.

A key achievement has been the establishment of a shared understanding of data needs and methodological approaches. **HEROES has supported convergence in how countries collect, interpret and use HWF data**. This provides a stronger foundation for comparability, benchmarking and continuous improvement of data systems.

HEROES clearly underlines added value of EU-level action through pooling of expertise, accelerated methodological development and supported more coherent approaches across Member States.

Building on these achievements, **there is strong potential to further consolidate efforts,** notably by **aligning HWF data initiatives with broader European frameworks such as the European Health Data Space which** represents a key opportunity to strengthen evidence-based policymaking and support the long-term sustainability of health systems across Europe.

6. COUNTRY REPORTS

COUNTRY REPORT GREECE

6.1. COUNTRY REPORT GREECE

Introduction

National HWF Planning System before HEROES

At the outset of the HEROES Joint Action (2023), HWF planning was recognized in Greece as an important policy domain, which was linked to the legacy of the previous Joint Action on HWF Planning and Forecasting (2013-2016) and the SEPEN Joint Tender. However, health workforce planning in Greece at this stage was not fully institutionalized and was not a systematic function. Workforce-related responsibilities were distributed across multiple institutions, including the Ministry of Health, Regional Health Authorities, professional regulatory bodies, academic institutions, and statistical services. While this reflected the structural complexity of the Greek health system, coordination mechanisms specifically dedicated to workforce forecasting and medium- to long-term planning were still developing. Planning processes were largely influenced by established staffing norms, budgetary constraints, and immediate service needs rather than by integrated analytical models combining supply, demand, and labor market dynamics. As a result, workforce planning functioned more as an administrative and regulatory activity than as a strategic, data-driven policy instrument embedded within broader health system reforms.

From a data perspective, Greece possessed a considerable volume of HWF related information, but these datasets were maintained across separate institutional platforms and were not originally designed to operate within a unified HWF Information System (HRIS). Data fragmentation, differences in definitions, reporting cycles, and limited interoperability constrained their analytical use for forecasting and scenario development. Although descriptive statistics on key professional groups, particularly physicians and nurses, were available, systematic integration of HWF data with service delivery metrics, workload indicators, demographic projections, and quality-of-care measures were limited. In practice, decision-making relied on partial datasets combined with expert judgement. The absence of a nationally agreed Advanced Minimum Dataset (AMDS) and harmonized indicator framework meant that planning discussions often focused on headcounts rather than on skill mix, productivity, working conditions, or longer-term sustainability of the workforce.

At the same time, capacity for HWF planning existed but was unevenly distributed across institutions. Expertise in health management, epidemiology, and statistics was present within academia and selected policy units, yet there was no formalized national community of workforce planners using shared methodologies or forecasting tools. Analytical models were emerging but not routinely applied within policy cycles. The governance of workforce planning was evolving, with increasing awareness of the need for more structured forecasting, although institutional integration remained incomplete.

Greece joined HEROES with motivated stakeholders and fragmented but available data, recognizing the importance of workforce intelligence, yet still lacking a consolidated HRIS, standardized indicators, and a fully integrated forecasting approach in decision-making.

HEROES: Key Achievements

During HEROES (2023-2026), Greece achieved the following key milestones in strengthening its HWF planning system:

- **2023: Consolidation of a baseline assessment, including the governance framework**

  At the outset of HEROES, Greece conducted a structured baseline assessment of its HWF planning architecture, including data systems, governance arrangements, and analytical capacity. This process brought together key actors, Ministry of Health, Regional Health Authorities, Agency for Quality Assurance in Health (O.DI.PY.), academia, professional associations, and WHO, under a common national direction. The baseline exercise clarified institutional roles, mapped available data sources, and established a shared understanding of existing gaps, laying the foundation for coordinated action to optimize data, tools, and skills for HWF planning and forecasting.

- **2024: Development of core HWF indicators and Advanced Minimum Data Set (AMDS)**

  Building on the baseline analysis, Greece developed a structured set of national HWF indicators aligned with EU and WHO standards and refined the Advanced Minimum Data Set (AMDS). The indicator framework was designed to support both immediate monitoring needs and longer-term HRIS development. This marked a transition from fragmented descriptive data toward a more coherent HWF data system, linking staffing levels, skill mix, education, and quality-related metrics within a structured analytical framework.

- **2024-2025: Introduction and exploratory application of workforce planning tools**

  Greece introduced forecasting and workforce planning tools (including the HWF NIVEL model) within a structured technical and training context. Rather than conducting a formal pilot, the tools were applied in a workshop and exploratory setting, using available historical data for general practitioners and nurses. These exercises served as technical demonstrations, allowing stakeholders to test stock-and-flow logic, examine demographic trends, and explore simplified demand scenarios.
  Although conducted in a controlled and analytical environment, these exercises helped familiarize planners with dynamic modelling concepts and illustrated how HWF data could support more forward-looking policy discussions (for example taking into consideration quality of care indicators into HWF planning). The process contributed to a shift from static staffing ratios towards more structured analytical approaches that incorporate labor market dimensions and scenario-based reasoning, exploring alternative futures by varying assumptions rather than relying on a single projection.

- **2024-2025: Strengthening governance through a structured Policy Dialogue**

  A serie s of pre-policy dialogues (November 2024, March 2025) and structured Policy Dialogues (May 2025, December 2025), as part of HEROES, created a formal platform for coordination and consensus-building among national stakeholders. Key takeaways from these discussions include:

  - There was a strong shared understanding that HWF data need to become more integrated and interoperable, so that different systems can combine efforts and better support planning.
  - Participants highlighted the importance of developing forecasting models that are formally embedded in the system and better connected with education and training pathways.

- The discussions pointed to the need for stronger interdisciplinary roles, as well as a more balanced governance model that combines central coordination with flexibility at different levels.
- There was also a clear need to build skills in health policy and workforce planning, alongside the development of more practical and user-friendly planning tools.
- Finally, emphasis was placed on strengthening the professional autonomy of nurses, recognizing their key role in improving the responsiveness and quality of care.

  These dialogues supported alignment of the three national action plans (created for HEROES), clarified governance roles, and strengthened institutional ownership of HWF planning reforms. This collective effort resulted in a coherent and structured approach, built around three strategic pillars: (1) optimization of data, (2) development of planning and forecasting tools, and (3) capacity-building to support the effective implementation of HWF planning and forecasting. Moreover, these policy dialogues emerged as a critical governance mechanism, reinforcing transparency, shared responsibility, and evidence-informed decision-making.

- **2025-2026: Integration with the HEALTH-IQ Platform and Capacity Building Rollout**

  During the later phase of HEROES, workforce planning efforts were progressively aligned with the national HEALTH-IQ digital platform[1], integrating HWF indicators within a broader quality and monitoring architecture. In parallel, structured training programmes were developed and launched (February 2026), engaging approximately 50 senior executives and planners from the Ministry of Health, Regional Health Authorities, academia, and professional bodies such as the Hellenic Nurses Association and the Panhellenic Medical Association. These actions strengthened institutional capacity and reinforced the transition from project-based implementation to sustainable HWF planning governance.[1]

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

The experience of implementing the HEROES Joint Action in Greece can be summarised in three progressive phases: adoption, implementation, and consolidation. During the initial adoption phase, a key lesson was that HWF planning requires broad institutional alignment as a precondition for technical tools to become effective. Establishing a shared understanding of the purpose and value of HWF intelligence proved essential. The baseline assessment and early policy dialogues demonstrated that HWF planning is not solely a quantitative exercise, but a governance function that depends on clearly defined roles, trust among stakeholders, and political recognition of its strategic importance. This phase reinforced the need to treat planning as a cross-sectoral policy domain, involving education, labor market regulation, service delivery, and quality of care.

During the implementation phase, Greece learned that strengthening data systems and analytical tools must proceed in parallel with capacity building and governance reform. The introduction of HRH indicators, the refinement of the Advanced Minimum Data Set, and the structured, workshop-based application of forecasting tools using historical data highlighted both the potential and the practical constraints of HWF modelling in a fragmented data environment. A critical insight was that even well-designed tools cannot generate sustainable impact without institutional ownership and trained personnel capable of interpreting and contextualizing analytical outputs. The integration of HWF indicators within the evolving HEALTH-IQ digital infrastructure further demonstrated the importance of embedding HWF intelligence within broader health system reforms rather than treating it as a stand-alone technical exercise.

1 [1] The HEALTH-IQ project by World Health Organization in Greece is a joint initiative with the Ministry of Health that aims to develop and implement a national framework for measuring and improving the quality, safety, and performance of healthcare services, using standardized indicators and patient-centred approaches.

In the upscaling phase, attention shifted toward sustainability and institutionalization. The HEROES experience underscored that incremental progress is both realistic and valuable in complex systems.

Rather than pursuing immediate structural transformation, Greece focused on building foundational elements: shared indicator definitions, governance dialogue mechanisms, and training programmes for planners and executives. Another important lesson concerns the balance between ambition and feasibility. Presenting HWF planning as an emerging but progressively strengthening function helped manage expectations while maintaining momentum. Overall, the past three years have reinforced the understanding that sustainable HWF planning depends on coordinated development across governance, data systems, analytical capacity, and human capital, supported by continuous dialogue and international collaboration.

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

Domain 1: Political and contextual support

Greece's health system is characterized by centrally defined policy direction combined with regionally implemented service delivery. The Ministry of Health sets national strategy, regulatory frameworks, and workforce policy parameters, while Regional Health Authorities are responsible for operational management of public hospitals and primary care structures. The system includes a mix of public provision and private practice, particularly among physicians, creating labour market dynamics that influence recruitment, retention, and workforce distribution. This institutional configuration directly affects HWF planning, as decisions related to education capacity, employment conditions, mobility, and deployment involve multiple actors operating at different governance levels. As a result, HWF planning requires coordination mechanisms that bridge central policy authority with regional implementation realities.

The broader policy environment during the HEROES period created favourable contextual conditions for strengthening HWF planning. Ongoing and planned reforms aimed at enhancing digital health infrastructure, quality-of-care monitoring, and data interoperability have provided an opportunity to position workforce intelligence as a strategic enabler of health system performance. In particular, the progressive development of the HEALTH-IQ platform is intended to establish a national digital architecture capable of integrating quality, safety, and HWF-related indicators within a unified dashboard environment. The alignment of the work done within the HEROES project with this evolving digital reform agenda has allowed HWF planning to be framed not only as a staffing exercise, but as part of a wider quality and governance transformation. While full operational integration is still under development, this contextual alignment has reinforced the policy relevance of HWF monitoring and created a structured pathway toward embedding HWF data within routine system management processes over time.

At the same time, the Greek context presents structural considerations that shape the HWF planning process. Health workforce supply is influenced by strong medical education output and significant private sector activity, while shortages in nursing and specific specialties coexist with geographical imbalances. These dynamics require planning approaches that account for labour market incentives, working conditions, and migration patterns in addition to accounts. Furthermore, the centralized nature of policymaking necessitates mechanisms for incorporating regional perspectives into national planning discussions. Within this environment, HEROES contributed to strengthening political and institutional recognition of workforce planning as a medium- to long-term strategic function. While formal structures continue to evolve, HEROES helped consolidate the understanding that sustainable workforce policy depends on integrating data systems, governance arrangements, analytical tools, and capacity development within the broader national reform trajectory.

Domain 2: Human Resources for Health (HRH) governance

In Greece, HWF planning responsibilities are distributed across several institutions. The Ministry of Health provides strategic direction, Regional Health Authorities (RHAs) oversee operational management, O.DI.PY. supports monitoring and coordination, academia contributes technical expertise, and professional bodies influence regulation and standards.

A formally institutionalized national coordination body dedicated exclusively to integrated HWF planning and forecasting system has not yet been established. However, structured governance mechanisms put in place during HEROES strengthened coordination. Discussions are ongoing regarding formalization of coordination arrangements within the Ministry of Health, particularly in relation to the evolving HEALTH-IQ/HRIS system.

Below is the consolidated stakeholder table, based on the national as-is stakeholder analysis conducted as part of HEROES, during its first year.

Table: Key Stakeholders in the Greek HWF Planning System

	Name of the stakeholder	Type of stakeholder	Involvement in the HWF planning process	HWF Data		HWF process and tools		HWF planning skills	
				I	P	I	P	I	P
1	General Directorate of Health Services	Ministry	INVOLVED	H	H	H	H	H	L
2	Directorate of Doctors, Other Scientists and Health Professionals	Ministry	INVOLVED	H	H	H	H	H	L
3	Department of Health Data Management, Autonomous Directorate of Electronic Government	Ministry	INVOLVED	H	H	H	H	H	L
4	Regional Health Authorities (eg 3rd and 4th)	Local / Regional Authority	INVOLVED	H	H	H	H	H	L
5	Athens Medical Society	Health Professional Order	INVOLVED	H	L	H	L	L	L
6	ENE (Hellenic Regulatory Body of Nurses)	Health Professional Order	INVOLVED	H	H	H	L	H	L
7	Hospitals (eg Agia Sofia Hospital Athens, Attikon Hospital, Hippokrateion Hospital of Athens)	Other - Hospital	INVOLVED	H	L	H	L	H	L
8	Pan-Hellenic Medical Association	Health Professional Order	INVOLVED	H	H	H	L	L	L
9	Universities and educational institutions (eg National and Kapodistrian University of Athens, Panteion University of Social and Political Sciences)	Academia	INVOLVED	H	L	H	L	H	H

Abbreviations

H	High
L	Low
I	Interest
P	Power

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

The stakeholder landscape in Greece reflects a multi-level governance structure in which policy authority, operational responsibility, and technical expertise are distributed across institutions. High-power actors, notably the Ministry of Health and the Regional Health Authorities, determine strategic direction and resource allocation, while high-interest technical partners, such as O.DI.PY., academic institutions, and the WHO, support methodological development and analytical capacity. Professional associations and regulatory bodies exercise moderate-to-high influence due to their impact on HWF supply and professional standards, while ministries beyond health play indirect, but important roles in shaping education pipelines and labor market conditions.

This distribution of power and interest mirrors the institutional logic of the Greek health system. The Ministry of Health retains ultimate authority over workforce policy and therefore combines high power with high interest in planning outcomes. Regional Health Authorities share a similar position due to their responsibility for implementation and operational accountability. By contrast, O.DI.PY. and academic partners demonstrate strong technical engagement, but possess more limited formal decision-making authority, positioning them primarily as strategic enablers rather than final decision-makers.

Overall, this distribution of roles shows the need for better coordination between those who shape policy, those who provide technical expertise, and those who implement decisions in practice. The approach adopted under HEROES-through structured policy dialogues, joint work on indicators, and collaborative analysis-helped bring these groups closer together, improving alignment and paving the way for more structured and effective coordination in the future.

Domain 3: HWF planners' capabilities

sAt the outset of the HEROES Joint Action, Greece's capacity for HWF planning built mainly on motivated professionals and relevant expertise, but without a consolidated national training framework dedicated specifically to HWF forecasting and analytical planning. Expertise in health management, statistics, and policy analysis was available within academia and selected institutional units; however, systematic training in workforce modelling, data analytics for planning, labor market dynamics, and governance-based forecasting was limited. Workforce planning activities are often built on descriptive analysis and administrative reporting rather than on structured forecasting methodologies or integrated analytical tools. The baseline assessment (conducted within the initial phase of HEROES) therefore identified the need to strengthen both task-specific technical proficiencies (e.g. ability to handle coding or data analysis or modeling) and the holistic capacity for the strategic use of health workforce planning (strategic competencies necessary for policy alignment, governance coordination, and methods that explore alternative futures by varying assumption, and scenario-based planning).

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

Within this framework, Greece initiated a structured capacity-building program for health policy development, HWF planning and data analytics and assessment for HWF planning skills.

A national two-day training workshop (17-18 February 2026, hybrid format) was conducted with the participation of approximately 50 senior executives and planners from the Ministry of Health, Regional Health Authorities, academic institutions, professional associations, and O.DI.PY.

The program combined theoretical foundations (health labor market concepts, stock-and-flow dynamics, governance frameworks) with practical exercises in scenario-based planning as described above, key performance indicator (KPI) development, and interpretation of HWF indicators.

The training incorporated international experience (including best practices from other HEROES partners, e.g. Malta) and WHO methodological guidance, reinforcing the transition from static staffing ratios toward more dynamic and policy-relevant planning approaches.

Beyond this central workshop, introductory training materials on HWF planning methods and tools were developed, and earlier capacity-building activities (including a workshop in May 2025 focusing on nursing workforce planning) supported practical engagement of key stakeholders. These activities strengthened awareness of labor market dynamics, the importance of interoperable data systems (HEALTH-IQ/HRIS), and the role of governance in sustainable HWF planning. It is recognized that not all identified skill gaps could be fully addressed within the duration of HEROES. Training delivery was prioritized according to immediate needs and available resources, focusing initially on senior planners and decision-makers. The sustainability plan foresees the continuation and gradual expansion of training activities, including structured national programmes and periodic workshops in collaboration with WHO and academic partners. In this way, enhancing strategic competencies is positioned not as a one-off intervention, but as a long-term institutional development process aimed at embedding data-driven planning within routine governance cycles.

Domain 4: HWF data and models

HWF Data: Sources

In Greece, HWF data are generated and held by multiple institutions, reflecting the structure of the health system and the division of responsibilities between policy, regulation, and service delivery (Economou et al., 2017; Kaitelidou et al, 2018). Key suppliers include the Ministry of Health and Regional Health Authorities (administrative HR and staffing data), health facilities (post-level staffing and vacancies), professional bodies and regulators (registration and professional status), national statistical authorities (population and labor market statistics), and - where relevant- education and training bodies (pipeline and training outputs). Data used for planning primarily describes supply side data (headcounts, distribution, age structure, turnover) and, to a more limited extent, demand side data (population growth, unmet health needs) depending on availability and interoperability with health information systems. As highlighted in the baseline analysis (baseline assessment of HWF planning architecture, including data systems, governance arrangements, and analytical capacity for Greece, within HEROES), the main challenge has not been the absence of data per se, but the fragmented governance, different definitions and reporting cycles, and limited interoperability between datasets for forecasting and scenario work.

Advanced Minimum Data Set: achievements under HEROES

During HEROES, Greece revised and strengthened its AMDS to better support systematic monitoring and, progressively, more planning-oriented analysis (Table 2). Improvements focused on clarifying the core quantitative variables required for HWF supply monitoring (e.g., staffing levels and distribution, key demographic characteristics, and vacancies/shortfalls where available) and on expanding the readiness to incorporate demand-relevant information as data infrastructure matures. In parallel, the HEROES discussions helped advance qualitative components that go beyond availability/accessibility and support interpretation of “drivers of change” in planning. These qualitative elements increasingly draw on: (1) care organization (service configuration and delivery models, primary vs hospital care pathways), (2) health indicators (signals related to quality/safety and workload pressures), and (3) labor market dimensions (turnover, retirement dynamics, resignations, and conditions shaping retention). This shift aligns with the integrated HWF monitoring approach being developed through HEALTH-IQ, where HWF indicators are explicitly linked with quality-of-care and patient safety considerations and prioritized through stakeholder-led scoring for feasibility and policy relevance.

Table 2. Advanced Minimum Dataset for HWF Planning

Advanced Minimum Dataset for HWF Planning							
Please consider the planning goals - LEVEL 1 - Awareness of the stock, Knowing the current stock and identifying active-inactive stock, sustaining the stock							
Please mark each marked cell "X" with the following codes							
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							
Quantitative data set	Supply side					Demand side	
	Labour force	Training	Retirement	Outflow migration	Inflow migration	Population	Health consumption
Profession	X	X					
Age	X	X					
Head count	X	X					
FTE							
Geographical area	X*	X					
Specialisation	X*	X					
Country of first qualification	X*						
Gender	X*						
Qualitative data set							
	Care organisation						
Teamwork	X						
Task shifting and skill-mix	X						
Reconfiguring health services including digital	X						
	Health indicatiors						
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						
*Partially available							

HWF Data: improvements

HEROES supported Greece in moving from fragmented datasets towards a more structured HWF data "architecture" that can progressively underpin planning. The first achievement was the consolidation of a shared understanding among key actors regarding what constitutes essential data for decision-making-leading to a clearer minimum dataset orientation and a more coherent set of indicators focused on staffing, skill mix, education/training, and core dynamics shaping availability over time.

A second area of progress concerned governance and usability. Through structured coordination and policy dialogues, as part of HEROES, stakeholders began to clarify institutional roles in data production and use, strengthening the conditions for more consistent data sharing, joint interpretation, and gradual linkage across systems. While full interoperability remains a longer-term objective, these steps helped reduce reliance on ad hoc data extraction and made routine monitoring more feasible through common definitions and indicators.

Third, HEROES strengthened the bridge between HWF data and broader system monitoring reforms, especially through alignment with the HEALTH-IQ platform. In this integrated approach, HWF indicators are designed to sit alongside quality-of-care metrics within a unified digital dashboard, enabling more policy-relevant interpretation (e.g., relating staffing patterns to safety and performance outcomes) and supporting more consistent, standardized reporting as platform scales. The operational update also highlights a step-by-step approach: starting with indicators that can be easily automated and gradually adding more advanced ones-such as those based on surveys or system capacity (e.g., satisfaction, burnout, CPD tracking) - as systems and infrastructure improve.

Finally, Greece introduced monitoring frameworks and KPIs to support accountability and learning. These mechanisms focus on data integration and quality, stakeholder engagement, and the progressive use of HWF data in planning processes, framing monitoring not only as reporting, but as a tool for iterative improvement. This is consistent with the sustainability plan, as part of HEROES, which places emphasis on interoperability between HWF data sources, and embedding HWF information within national and regional policies cycles.

HWF Data: HEROES contributions and future directions

Building on the progress achieved during the project, Greece's data-related sustainability plan, as developed via HEROES, focuses on consolidating HWF data, strengthening interoperability between HWF data sources, and embedding HWF indicators within national digital systems. The sustainability milestones developed in collaboration with HEROES partners provide a structured roadmap for this next phase, emphasizing interoperability standards and long-term integration of HWF data

A central priority concerns the continued development and progressive operationalization of the HWF module within the national HEALTH-IQ platform. As the platform advances from pilot stages towards broader implementation, HWF-related indicators developed and refined under HEROES are expected to be incorporated into a standardized digital monitoring environment. This integration aims to support more systematic data collection, more consistent reporting, and greater transparency at national and regional levels. Future data-related actions include:

- further refinement and validation of the national HWF indicator set,
- progressive alignment of definitions across institutions providing HWF data,
- strengthening interoperability between HEALTH-IQ and other national data systems, including administrative and statistical databases,
- gradual automation for selected HWF data and indicators to reduce manual reporting burden,
- expansion of qualitative and more refined HWF data.

The long-term objective is not limited to technical interoperability, but to normalize the routine use of HWF intelligence in decision-making processes at both central and regional levels. In this sense, sustainability is framed as the institutional embedding of structured data flows and standardized monitoring practices rather than as a one-off digital deployment.

Monitoring frameworks and KPIs introduced during HEROES will continue to guide follow-up actions, providing a mechanism for tracking progress in data integration, quality assurance, and reporting timeliness. These mechanisms are expected to evolve in parallel with digital infrastructure development and growing maturity of governance.

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

At the time of HEROES, Greece did not operate a fully institutionalized, routinely applied national HWF planning and forecasting model. However, structured efforts were undertaken to introduce analytical tools capable of supporting medium- to long-term planning. As a result, the current HWF planning model can be described as emerging: it has been technically explored and conceptually integrated into planning discussions, but it is not yet embedded as a permanent, legally mandated forecasting mechanism.

Within this context, the introduction of a HWF planning and forecasting model was supported through collaboration with international partners, including the use of the NIVEL HWF forecasting methodology. During 2024-2025, the tool was explored in a structured workshop and analytical setting using historical data, rather than through a formal pilot. The primary objective was to strengthen analytical understanding and to support more structured discussions on workforce shortages, supply-demand imbalances, and the longer-term sustainability of the medical and nursing workforce.

In practical terms, these exploratory exercises focused primarily on general practitioners and nurses, reflecting their strategic importance and relative data availability. The modelling work was conducted at national level, with implications for regional-level dialogue. Although the model is not yet applied across all professions or sectors, it provides a structured methodological framework that can gradually be extended as data maturity and institutional capacity improve.

Methodologically, future HWF needs are projected using a stock-and-flow logic that incorporates inflows (such as graduates and recruitment), outflows (including retirements and resignations), and demographic trends. Projections are currently based primarily on headcounts, with progressive consideration of age structure and participation patterns. As data systems continue to evolve, the model may incorporate fuller FTE-based adjustments and more granular HWF labor market variables.

On the demand side, estimation remains at an early stage of development. It combines demographic projections with policy considerations and unmet population health needs. While not yet grounded in fully integrated workload or morbidity-driven modelling, scenario exercises explore how population ageing and staffing norms may influence future workforce requirements. This exploratory approach allows planners to test assumptions without presenting projections as definitive forecasts.

Bringing supply side and demand side together, gap analysis for the current situation relies on vacancy data (where available), regional imbalances, and HWF distribution: projected supply trends are compared with estimated demand scenarios to identify potential shortages or surpluses. Importantly, these outputs are used to inform policy dialogue and strategic reflection rather than to trigger automatic regulatory or budgetary adjustments.

HWF Planning Models: HEROES contribution and future directions

HEROES contributed to the introduction of structured HWF planning and forecasting approaches within the Greek health system. Through workshops, policy dialogues and capacity-building activities, it supported the adoption of forecasting methodologies, strengthened analytical capacity for interpreting workforce data, and promoted a shared understanding of evidence-informed HWF planning among national stakeholders. In this way, HEROES contributed to more structured discussions on workforce shortages, suppl-demand imbalances and the long-term sustainability of the health workforce.

Given its evolution, the formal evaluation of the HWF planning and forecasting model, established under HEROES, has not yet been completed. Its application remains exploratory and capacity-building oriented. Nevertheless, feedback from stakeholders participating in policy dialogues and training activities, as part of HEROES, indicates that the tool has enhanced understanding of labor market dynamics and strengthened analytical awareness among planners, laying the groundwork for more structured future application.

Looking ahead, Greece intends to build on the foundations established through HEROES by further operationalising the HWF planning and forecasting model within routine health workforce governance processes. Future priorities include expanding the methodology to additional health professions, improving data quality and interoperability through the evolving HEALTH-IQ/HRIS architecture, incorporating more comprehensive labour market variables and FTE-based analyses, and further strengthening forecasting and scenario-planning capabilities. As these elements mature, the model is expected to provide an increasingly robust evidence base for health workforce planning and contribute to more transparent, sustainable and forward-looking policy decisions.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

Beyond data consolidation, Greece's future plans for HWF planning aim to progressively strengthen governance coordination and enhance the analytical robustness of the HEROES HWF planning and forecasting model. While the model remains in a development stage, future efforts will focus on expanding its scope, deepening methodological refinement, and aligning its use with structured governance processes. From a modelling perspective, planned actions include:

- gradual extension of forecasting exercises to additional professional groups beyond general practitioners and nurses,
- refinement of demand-side estimation approaches through stronger linkage to demographic projections and evolving service delivery models,
- improved incorporation of labour market variables, including retirement patterns, turnover dynamics, and participation rates,
- progressive consideration of FTE-based measures and scenario simulations as data availability improves.

Importantly, further development of the HWF planning and forecasting model will remain closely connected to governance processes. The intention is to ensure that analytical outputs support policy dialogue and strategic reflection rather than functioning as isolated technical products.

Governance strengthening remains a parallel priority. Discussions are ongoing regarding the reinforcement and potential formalization of coordination mechanisms for HWF planning within the Ministry of Health. These discussions build on the collaborative structures activated during HEROES and aim to ensure continuity beyond the HEROES period. Sustained collaboration with international partners, including WHO, EU networks, and academic institutions, will continue to support alignment with HWF planning principles and technical learning.

In this context, the progress achieved through the Joint Action HEROES, particularly in establishing a shared understanding among stakeholders, developing a core set of indicators, and initiating a structured approach to workforce planning, provides a strong foundation for further advancement. Building on this momentum, Greece would benefit from a future EU-level initiative, which could enable the consolidation, scaling, and long-term sustainability of the work initiated under HEROES.

Structured policy dialogue after HEROES will play a central role in the next phase. National dialogue events are envisaged as platforms for presenting updated data, reviewing analytical exercises, and aligning workforce strategies with broader reforms in education, labour market, and service organization. Through this mechanism, sustainability is conceived not only as the continuation of tools and processes, but as the gradual institutionalization of an evidence-informed planning culture within the Greek health system.

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COUNTRY REPORT IRELAND

6.2 COUNTRY REPORT: IRELAND

Introduction

National HWF Planning System before HEROES

The Department of Health in Ireland works closely with its agencies, including the Health Service Executive (HSE), across government departments such as the Department of Further and Higher Education, Research, Innovation and Science (DFHERIS) and Department of Children, Disability and Equality (DCDE), and a wide range of other stakeholders within the sector and internationally, to deliver health and social care services to the people of Ireland. The HSE delivers health and social care services, either through the six Health Regions which provide community and acute care services, through contracted third parties (private healthcare providers, community organisations or self-employed health professionals), or through grants to voluntary organisations. Within the Department of Health, the Strategic Workforce Planning Unit (SWPU) is responsible for workforce planning policy. Since the establishment of the Strategic Workforce Planning Unit in the Department of Health in 2020, significant progress has been made to support sustainable workforce planning activities.

Building the supply of the health and social care workforce is a long-term endeavour and following an EU Technical Support Instrument (TSI) project funded by SG Reform (European Commission) initiated in 2022, the Department of Health now has a planning tool to support long term strategic health and social care workforce planning. This HWF model allows the identification of supply-demand gaps across a wide range of health and social care workers and informs the design of policy recommendations to address the gaps. However, when the model was initially developed, data challenges affected the ability to produce workforce projections for a broader range of health and social care professions. Hence, over time, the scope and capacity of the health and social care workforce planning model will be further expanded by incorporating new datasets and research. The model is now incorporated into the Department's strategic workforce planning function which will allow for ongoing management of the model and the incorporation of new data, policy, and research, particularly for Health and Social Care Profession (HSCP) disciplines (term used for Allied Health Professions in Ireland). The JA HEROES project is supporting work to strengthen and expand the evidence available.

The HWF projection models have been updated and developed by Irish Government Economic and Evaluation Service (IGEES) staff within the Strategic Research and Evaluation Unit (SREU) in the Department of Health (DoH) in collaboration with SWPU who have assisted in defining the future demand and supply scenarios. Key inputs to the demand modelling are taken from the HIPPOCRATES model[2] which is funded through the DoH-ESRI (Economic and Social Research Institute) Research Programme in Healthcare Reform.

2 The HIPPOCRATES model provides base year estimates and projections of healthcare demand, capacity and expenditure for selected Irish health and social care services. Further information is available here: Hippocrates Model | ESRI

The development of these models continues the growth in technical modelling capacity for workforce planning available in Ireland over the last number of years. The National Doctors Training and Planning (NDTP) Unit in the HSE have been undertaking projections for medical workforce planning for over a decade and their projections make key contributions to the modelling undertaken by the Department of Health (National Doctors Training and Planning Unit, 2016, 2021). In July 2022, the ESRI, funded by the Health Service Executive (HSE), published an expansion to HIPPOCRATES to include workforce demand for publicly funded acute hospitals (Keegan et al., 2022). The Department of Health also first published research on workforce planning for medical doctors, and nurses & midwives in 2022[3] and 2023 .

HEROES: Key Achievements

Ireland formally joined JA HEROES in June 2025. During this time, the following milestones were successfully achieved:

- **Refinement of an Advanced Minimum Data Set:** Planning for a health and social care workforce in Ireland is not only a matter of determining the right numbers required. It also requires a vision on the right match between skills available in the health and social care workforce and patients' needs. As part of JA HEROES, Ireland plans to create a strong and reliable minimum data set with an aim to improve the modelling, governance and planning capabilities within the Department of Health. As new data becomes available, this will inform demand and supply modelling.
- **Productive Engagements:** Productive engagement with key national stakeholders through events in 2025 and 2026[4] These events included JA HEROES termed engagements known as "Policy Dialogues". Policy Dialogues are effectively structured and purposeful conversations between different stakeholders who are in decision-making positions or can strongly affect the implementation of potential solutions to challenging issues.
- **Development of Action Plans:** Action plans to support and drive key work areas aligned to the Framework for Sustainable HWF Intelligence Systems were developed for each of the tasks as part of JA HEROES[5].
- **Published a Paper on "Ireland's Future Health and Social Care Workforce":** In December 2025, the Minister for Health in Ireland published a new paper called "Ireland's Future Health and Social Care Workforce" . This paper sets out an evidence based strategic direction for the health and social care workforce for the next 15 years. The development of this paper coincided with Ireland joining JA HEROES as a new international partner. Through the Department of Health's membership, the capabilities and ambition of the workforce planning team have expanded, building on the project learnings and setting clear goals through our action plans.
- **Alignment for the development of a Medical Workforce Strategy:** Following a policy dialogue held in December 2025 as part of the JA HEROES, it was decided that medical workforce planning in Ireland requires collaboration through the development of a joint paper on medical workforce planning. The Department of Health in discussions with the NDTP (National Doctors Training & Planning) agreed that a joint paper was required to determine the future configuration of the Irish medical workforce. The Department's workforce planning is mainly focused on determining the right numbers at an aggregate system level but the aim of this collaboration between the Department and the NDTP ensures that the development of a medical workforce planning strategy will align the recruitment, education and training of the medical workforce with the needs of the population. This project will not be delivered beyond the lifetime of JA HEROES, but the policy dialogue allowed time for planners to reflect and assess the challenges and opportunities available through collaboration to progress a medical workforce planning strategy aligning health service need to number of doctors in training.

3 Caulfield, P., Hynes, T., & O'Connor, P. (2022, September). Spending Review 2022: A System Dynamics Model of Nursing and Midwifery Workforce Supply. Retrieved from Gov.ie: https://assets.gov.ie/257131/fbbe5c4e-63cc-49f9-bcf4-f0ddc71e5850.pdf

4 Hynes, T & O'Connor, P. (2023, March). Spending Review 2022: An Analysis of Medical Workforce Supply. Retrieved from Gov.ie: an-analysis-of-medical-workforce-supply-7b274be6-95b6-4375-b587-70e82150bb09.pdf

5 Minister for Health publishes paper on Ireland's Future Health and Social Care Workforce

- **Shared Learning and Network Building:** JA HEROES also provides Ireland with the opportunity to learn from other countries and by doing so improve the delivery of health and social care services in Ireland through our improved workforce planning capabilities and expertise.

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

Adoption

Through JA HEROES, Ireland has gained significant insights into best practice across Europe and how countries are planning to scale their HWF planning and forecasting systems. As Ireland has recently undergone a significant health service reform with the establishment of six new HSE health regions, JA HEROES membership has offered an opportunity to learn from other countries with similar decentralised systems. A lesson learned is that strong governance frameworks are required to avoid fragmented data collection.

Implementation

As a result of our collaboration with JA HEROES and through engagement as part of the associated EU-level policy dialogues, the expertise and capabilities of the SWPU team have improved considerably, enabling better communications with both internal and external stakeholders.

As part of JA HEROES, a policy dialogue was held in February 2026, which brought together representatives from Ireland's health and social care system, to discuss Ireland's Future Health and Social Care Workforce and to begin co-creating a shared vision for an effective, evidence-based workforce planning system. The forum aligns with the Department of Health's commitment to establishing sustainable workforce planning capabilities and with Ireland's participation in the WHO work on sustainability within JA HEROES.

The dialogue served three core purposes:

1. Awareness and alignment: To ensure all stakeholders understand the strategic direction and key principles set out in “Irelands Future Health and Social Care Workforce” paper published in December 2025, including the shift from reactive, shortage-centric planning to a proactive, needs-based, integrated-care approach.
2. Vision-building: To develop consensus around the core functions, capabilities and governance arrangements that an Irish workforce planning system requires, drawing on international best practice through JA HEROES.
3. Priority-setting: To identify perceptions of the most critical actions and enablers for the next 12–24 months, so that the Department of Health can begin to develop an implementation plan/approach.

The outputs of this dialogue will directly inform the development of Ireland's workforce intelligence system and guide the establishment of clear governance structures, data-sharing agreements, and collaborative mechanisms between the Department of Health, the Health Service Executive, regional actors, professional regulators and other government departments.

Upscaling

As part of the JA HEROES, the World Health Organization (WHO) in collaboration with countries developed a Framework for Sustainable HWF Intelligence System which aims to provide a straightforward approach to adopting a systems perspective. The underpinning hierarchy of interventions emphasised the interdependence of interventions in this space.

The Department will work with the WHO and other European partners and workforce planners to establish how best to ensure there are sustainable workforce planning activities in place to create an iterative planning process which continues to improve over time. This will be informed by the Sustainability Factors Report for Ireland, including formalising a forum in the form of a Technical Group on workforce planning.

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

Domain 1: Political and contextual support

The functions of the Department of Health include providing strategic leadership and policy direction for the Irish healthcare system; undertaking effective governance and performance oversight; and collaborating to ensure that health priorities are achieved. The Health Service Executive (HSE) manages and delivers, or arranges to be delivered on its behalf, public health and social care services. The delivery of services is currently emerging from a period of organisational change. Since 2024, the design and delivery of health services is being driven through the six HSE Health Regions, each led by a Regional Executive Officer (REO). Each is responsible and accountable for the coordinated planning and delivery of health and social care services for their respective populations. Hospitals in Ireland may have statutory, voluntary or private (for profit) ownership. Statutory hospitals are owned and funded by the HSE. Voluntary hospitals, usually established by religious organisations or independent boards, are primarily State funded. Many of the largest acute hospitals are owned by voluntary organisations. The Department of Health's workforce planning remit covers all three forms of ownership (public, voluntary and private) within the scope of modelling efforts across the acute care, primary and community care, disabilities, mental health and older persons care areas.

Sláintecare[6] is the vision for the future of healthcare in Ireland. This vision entails establishing a universal, single-tier and high-quality health and social care system, where patients have access to services based solely on health needs and with a view to providing the right care, at the right place, delivered at the right time, by the right team. Building on this, in 2025 the Path to Universal Healthcare – Sláintecare & Programme for Government 2025+[7] was published. This document aims to forge the way towards accessible, affordable, high-quality, healthcare for the people of Ireland when they need it, where they need it.

The Department's role within workforce planning is to take strategic approach with focus on supply rather than recruitment. Ireland has a growing and aging population, and it is known that there are recruitment challenges within our health and social care system and that employers have an over-reliance on international recruitment. There is a plan to address this by building future supply of healthcare workers by significantly increasing student training places and gradually reducing Ireland's over reliance on international recruitment. The modelling work needs to identify a steady state supply and ensure that at a minimum, there is a sufficient supply of graduates to replace the existing workforce. This approach supports strategic decision-making by highlighting priority areas.

Domain 2: Human Resources for Health (HRH) governance

The Department of Health takes a leadership role to develop workforce planning policy and to guide and coordinate the planning process in collaboration with key stakeholders including the Health Service Executive (HSE), regulators and other government departments. Building on national and international evidence, the overall goal of the Department of Health's workforce planning work programme is to produce evidence-based rolling health and social care workforce planning action plans and implement targeted health and social care workforce policy measures to ensure that health services will have the appropriate workforce supply to meet the future health, and social care demands of our population. It's also about aligning education and training with the needs of the population.

6 Sláintecare

7 Path_to_Universal_Healthcare_Slaintecare__Programme_for_Gov_2025.pdf

The Department of Health regularly engages with international organisations (e.g. WHO, Organisation for Economic Co-operation and Development (OECD), European Commission) to learn and share information and knowledge. Evidence gained from international sources also informs our strategic process; for example, the "Framework for Action on the Health and Care Workforce in the WHO European Region 2023–2030" has strongly influenced this paper (WHO, 2023).

Within the HSE, there are teams that carry out workforce planning activities, with a focus on their services. For example, the Strategic Workforce Planning and Intelligence team and the National Doctors Training and Planning (NDTP) Unit. The Economic and Social Research Institute (ESRI) collaborates with the HSE to produce demand and capacity projections using the Hippocrates model[8], which underpins healthcare workforce and infrastructure planning. This modelling is central to informing strategic decisions at national and regional levels.

In Ireland, workforce regulatory bodies include:

- Medical Council of Ireland: The Medical Council is the regulatory body for doctors. It has a statutory role in protecting the public by promoting the highest professional standards amongst doctors practising in the Republic of Ireland. The Medical Council maintains the Register of Medical Practitioners - the Register of all doctors who are legally permitted to carry out medical work in Ireland.
- Nursery and Midwifery Board of Ireland: The Nursing and Midwifery Board of Ireland (NMBI) is the independent, statutory organisation which regulates the nursing and midwifery professions in Ireland. The NMBI work with nurses and midwives, the public and key stakeholders to enhance safety and care for people using services. Their mission is to protect the public and the integrity of the professions of nursing and midwifery through the promotion of high standards of education, training, and professional conduct.
- CORU: CORU is Ireland's multi-profession health regulator. CORU's role is to protect the public by promoting high standards of professional conduct, education, training and competence through statutory registration of regulated health and social care professionals. It is made up of the Health and Social Care Professionals Council and the Registration Boards, one for each profession named in our legislation.
- Pharmaceutical Society of Ireland: The Pharmaceutical Society of Ireland (PSI) – The Pharmacy Regulator, is the statutory body responsible for regulating pharmacists and pharmacies in the public interest.
- Dental Council: The Dental Council is the regulatory body for dental professionals in Ireland. Its general concern is to promote high standards of professional education and professional conduct among dentists.

The stakeholder landscape has evolved in recent years and now encompasses a wide range of actors who exert direct and contextual support to planning outcomes, be that the professional regulators collecting workforce data as part of their wider scope of protecting the public by regulating professional standards, education, and fitness to practise. The following table demonstrates, at a high-level, the main stakeholders involved in health and social care workforce planning in Ireland.

8 Hippocrates Model | ESRI

Name of the stakeholder	Type of stakeholder	Involvement in the HWF planning process	HWF Data		HWF process and tools		HWF planning skills	
			I	P	I	P	I	P
Department of Health	Ministry	Already involved	H	H	H	H	H	H
HSE	Health Professional Order	Already involved	H	H	H	H	H	H
Regional Health Areas	Local / Regional Authority	Not yet involved	H	H	H	H	H	L
ESRI	Statistics / Research Institute	Already involved	H	H	H	H	H	H
Department of Children, Equality, Disability and Integration	Ministry	Already involved	H	H	H	L	H	L
Department of Further and Higher Education	Ministry	Already involved	H	H	H	H	H	H
Private Hospitals Association	Society	Not yet involved	L	H	L	H	H	H
TUSLA (Child & Family Agency)	Governmental Agency	Already involved	H	H	H	L	H	H
Pharmaceutical Society of Ireland	Health Professional Order	Already involved	H	H	L	H	H	H
Higher Education Authority	Governmental Agency	Already involved	H	H	L	L	H	H
Irish Medical Council	Health Professional Order	Already involved	H	H	L	H	H	H
Nursing and Midwifery Board of Ireland	Health Professional Order	Already involved	H	H	L	H	H	H
CORU (HSCP Regulator)	Health Professional Order	Already involved	H	H	L	H	H	H
CSO	Statistics / Research Institute	Already involved	L	H	L	L	L	H
Department of Public Expenditure	Ministry	Already involved	H	H	H	L	H	L
National Doctors & Training Planning	Governmental Agency	Already involved	H	H	H	H	H	H

The work by the Department of Health is at a national level which covers both public, private and voluntary sector employees. With the recent decentralisation of the HSE to six new Health Regions, there is a need to ensure that modelling tools and data collection practices determine data reporting structures in the Regions in line with the advanced minimum dataset. Work is planned to further strengthen governance structures through the establishment of a stakeholder Technical Group.

To support this, the Department plans to establish a Health and Social Care Workforce Planning Technical Group to oversee and coordinate data gathering and other workforce planning model inputs, facilitate collaboration and coordination between the different sectoral groups, and provide visibility of planning outputs across the health and social care system. A harmonised and standardised approach between the Department of Health, HSE, regulators, professional bodies, Government departments and other data holders will also be taken to support data gathering and sharing of information to inform workforce planning modelling.

Domain 3: HWF planners' capabilities

Within the Department of Health, across those working in workforce planning, there are a variety of policy and technical capabilities. Currently within the Department of Health, there are a number of teams involved in workforce planning considering differing perspectives such as research and data, optimising performance, regulation and strategic planning. These areas can identify impending workforce opportunities and challenges which support and inform workforce planning policy formation and analysis.

An example of technical capability is previous work by the Department of Health where models based on system dynamics methodologies[9] were developed. This process involved workshops to explain concepts such as time delays, non-linearity and causal loops to workforce planners in the Department.

For the workforce projection model, given that the Department of Health was involved in the design of the workforce projection models, there is a good understanding of data within and how the models are structured. The team are aware of the source of the data and limitations of certain datasets.

Communication skills are also key. Strategic communication that is less technical and can be communicated effectively to a wider audience will be critical to the utilisation of the models' outputs and for the Department to lead on workforce planning. Stakeholder engagement efforts have been successful, but it is important to build on this to ensure that these stakeholders are involved in enhancing our capabilities through better data collection practices and providing qualitative evidence that can improve the accuracy of our modelling.

Currently there are significant recruitment challenges within the health and care system which will remain challenging in the short term given the education lag to increase the domestic supply of Health and care professionals. For some care areas such as Older Persons and Disability services, our care models incorporate public, private and voluntary bodies all looking to recruit from the same pool of healthcare workers. This complexity requires more transparency and oversight from the Department of Health to ensure that the number of staff in employment in those care areas is captured and allows for analysis on regional disparities in levels of care activity and future supply of health and care workers.

9 System dynamics models are widely applied as problem-solving tools as they can be used to represent complex systems visually and demonstrate how different qualitative factors relate and interact with each other, before numerical values are added. Further information on the Department of Health research is available here: Health Research and Statistics - Strategic workforce planning

As part of the process of developing the planning models, the Department of Health undertook a series of workshops to highlight data inputs and methodological approaches of the model and preliminary outputs. This approach of increasingly inviting stakeholders to engage with the model development process will continue into the future, increasingly training workforce planners' ability to interpret and use models in their decision-making process.

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

Within JA HEROES, Task 3 aimed to improve the skills and knowledge of workforce planners in Ireland. As part of the work under this task, the modelling team from National Doctors Training and Planning (NDTP) in the Health Service Executive (HSE) gave a high-level demonstration of the NDTP supply modelling capabilities for medical practitioners and also highlighted the importance of long-term planning for the medical workforce and the Irish Health and Social Care system.

The objective of the in person session, was to provide the Strategic Workforce Planning Unit team (eight members along with two colleagues from the Department's internal modelling team), with knowledge and understanding of the complexities of medical workforce planning and policy challenges that arise within medical workforce planning and the postgraduate training ecosystem, and why future medical workforce planning policies need to be cognisant of population demand for health services and the current training landscape and migration trends. Topics such as requirements by clinical specialty and at a HSE region level was also discussed at the training session. This session provided an understanding of medical workforce planning for participants and also gave those in the Strategic Workforce Planning Unit, Department of Health an opportunity to discover paths of potential further collaboration between the HSE NDTP the Department of Health. Further training sessions and demonstrations will be provided by the NDTP to the workforce planning team in the Department of Health, as the NDTP continue to develop their regional planning modelling capabilities.

As part of sustainability planning, the Department of Health intend to further strengthen the skills and capabilities of workforce planners across the Department and the Health, HSE including Health Regions, and the wider social care sector through workshops focused on enhancing modelling capability to include both quantitative and qualitative data collection.

Domain 4: HWF data and models

HWF Data: Sources

Ireland incorporates a wide range of datasets and statistical support from a number of bodies within the health system and educational system as well as through the national statistical office. These include the Health Service Executive (HSE), Ministry of Health, Central Statistical Office and Higher Education Authority, and the professional regulators including CORU, Pharmaceutical Society of Ireland, the Nursing and Midwifery Board of Ireland and the Medical Council of Ireland.

Data regarding stocks and flows of registered professionals are taken from Professional Regulators. Some regulators can disaggregate inflows into qualified in Ireland, qualified abroad and/or returns to practice and outflows can sometimes be disaggregated to retirees, left the country, left the profession. Over recent years professional regulators have expanded ICT (Information and communications technology) capabilities and increased technical staff which enabled improvements to data quality and coverage which supports achievement of the minimum dataset for workforce planning. Student places, graduates and course completion rates are sourced from the Higher Education Authority (HEA) which leads the strategic development of the Irish higher education and research system.

The HSE provides data on the public health and care workforce including total numbers employed in the provision of health and social care services by the HSE and Section 38[10] hospitals and agencies. During the JA HEROES the Department of Health established a Data Access Working Group which established a formal governance process to oversee the automated transfer of a wide range of HSE datasets to the Department of Health including on absences and turnover data enabling this information to be analysed and utilised in future projections.

Demand side

Demand side data incorporates Census data from the Central Statistical Office (CSO) to support population projections. These are utilised with health system service utilisation data. For acute hospitals service utilisation data on emergency department attendances, discharges, and outpatient attendances is reported by the Hospital In-Patient Enquiry (HIPE) Scheme as part of the Healthcare Pricing Office (HPO) and supplemented with waiting list data from the National Treatment Purchase Fund (NTPF). An administrative database is not publicly available for analysis for General Practitioners, so data is primarily taken from national surveys such as the Healthy Ireland survey and the Growing Up in Ireland study. There is no resident-level dataset capturing all long-term residential care residents or short/long-stay beds. Instead, data from the Health Information and Quality Authority (HIQA) and the HSE as well as Nursing Homes Ireland, a national representative body for nursing homes, and a national survey on ageing (The Irish Longitudinal Study on Ageing) are combined to produce alternative data. Disability services report data into the National Ability Supports System (NASS) on activity and need. Mental health data draws on the HSE's Doctors Integrated Management E-System (DIME) and medical training bodies. In recent years, the rollout of the Individual Health Identifier has progressed significantly, with identifiers now widely deployed across health and social care services and applied at scale in identifying individuals across the population, and its continued implementation is expected to play an important role in strengthening the quality and integration of health data across the system.

Qualitative Data

Qualitative data is not directly used within workforce modelling but supports interpretation of model outputs and policy decision making. Some professional regulators undertake annual surveys of their respective registers which include qualitative questions. The HSE undertakes the 'Your Opinion Counts' survey of their staff measuring domains such as engagement, well-being, and satisfaction. This qualitative information is supplemented with research from research studies from various universities and research groups around Ireland as well as international studies such as the WHO Regional Office for Europe Mental health of Nurses and Doctors (MeND) survey.

As part of the Joint Action, Ireland worked with the professional regulatory bodies to better align data requested from their registries to the conceptual framework underlying the workforce models, quality assure the model inputs and identify alternative forms of data to support more accurate analysis. This supported the development of an improved advanced minimum dataset across regulators.

In the 2025 registration period for nurses and midwives a data field has been added to the registration process which should improve the ability of workforce planners to separate out which professionals are working primarily as midwives or as one of the four nursing disciplines. This data will provide the foundation for separate projections of nurses and midwives which are currently not possible.

10 Section 38 of the Health Act, 2004. Bodies funded under this provision comprise mainly not for profit acute hospitals and organisations providing social care such as disability services and elder care services.

Advanced Minimum Data set

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

Quantitative data set	Demand side	
	Population	Health consumption
Profession		
Age	X	X
Head count	X	X
FTE		
Geographical area	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	X
	Labour market
Financial investment, economical background	X
Performance and productivity	X

Legend:

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

Co-funded by the European Union

HWF Data: improvements

Since June 2025, when Ireland joined the JA HEROES, there have been several engagements with the professional regulators and other data holders to improve the quality of data which can be input to the model. As a result of these engagements, the Department of Health now has a list of actions required by data holder to improve data collection and reach the minimum dataset.

HWF Data: HEROES contributions and future directions

Further work is planned to increasingly align data requested from registries to the requirements of workforce planning models. In 2026, a process will begin with the Nursing and Midwifery Board of Ireland to examine the initial data outputs of the 2026 registration process to understand the extent to which midwives and nurses can be separated out. This will involve comparative analysis with other health system datasets, for example within the HSE, the national health service.

Work on the Data Access Working Group established between the Department of Health and the HSE will continue to identify and automate access to datasets related to the HWF including vacancies and recruitment.

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

In 2021, the Department of Health developed a system dynamics model that was capable of modelling the supply of nurses and midwives in Ireland. The report[11] mapped available data on the nursing and midwifery workforce and communicated the urgent need for increased student intake for nurses and midwives in higher education institutions to policymakers, funders, and workforce planners in Ireland. A follow up report was also completed for Medical Doctors[12]. As a result of these two projects, there has been a steady increase in nursing, midwifery and medical school training places in recent years.

The workforce projection model currently used by the Department of Health was developed as part of a project[13] funded by the European Union via the Technical Support Instrument (TSI), managed by the European Commission's Reform and Investment Taskforce (SG Reform) and delivered by AARC-Indecon Consultants in collaboration with the Department of Health in 2023. Over 2024 and 2025 the Department of Health took over development and management of this model.

HWF Planning Models: Development and Methods

This model offers an approach for projecting our potential long-term staffing needs for the health sector (public and private). The model was a step up from the system dynamics models as it incorporated an integrated supply-demand framework that has enabled the Department of Health to quantify the scale of workforce required into the future, considering the implementation of planned polices and reform.

For each profession, demand is calculated in a 'bottom-up' approach using growth rates applied to the proportion of the workforce currently working in five care areas (Acutes, Primary care, Disabilities, Mental Health and Older Persons). Overall demand is estimated by aggregating the projections of workforce demand from individual care areas to produce an overall projection for each profession. During the JA HEROES national and regional capacity review was undertaken as part of a national exercise between the Ministry of Health and the Health Service Executive with the aim of developing a shared view of future health system demand.

11 https://assets.gov.ie/257131/fbbe5c4e-63cc-49f9-bcf4-f0ddc71e5850.pdf

12 https://www.gov.ie/pdf/?file=https://assets.gov.ie/249867/7a64955e-87f0-4d04-9c1c-7f3248983e63.pdf#page=null

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The growth rates for several care areas were sourced from the model utilised in this capacity review to healthcare activity, expenditure, bed capacity, and workforce for a range of services including public and private hospitals, GP and practice nurse services, long-term and home care services (public and private). For care areas not yet incorporated into the Hippocrates model, for example mental health and disabilities, growth in demand is projected using alternative sources combining CSO population projections, the Disability Capacity Review and the National Doctors Training and Planning (NDTP) Unit workforce projections. In general, some measure of unmet demand is taken into account for each profession.

Supply side

The supply-side of the modelling incorporates a 'stock-flow' framework for projecting supply. Supply projections consider the current stock and historical trends in supply growth (joiners and leavers), as provided by the relevant regulator, and domestic education and training pipeline, planned expansions to education places and observed flows in international recruitment. In addition, what has been considered is the age profile of each those on the register, those leaving and those joining. The current professional coverage of the models are Pharmacists, Occupational Therapists, Dispensing Opticians, Optometrists, Nurses & Midwives, Social Workers and Medical Practitioners.

The below figure is a high-level schematic of the Nursing & Midwifery model and its inputs and outputs. The inputs on the demand side are sourced from the NMBI (regulator), the ESRI scenarios (care area activity growth rates).

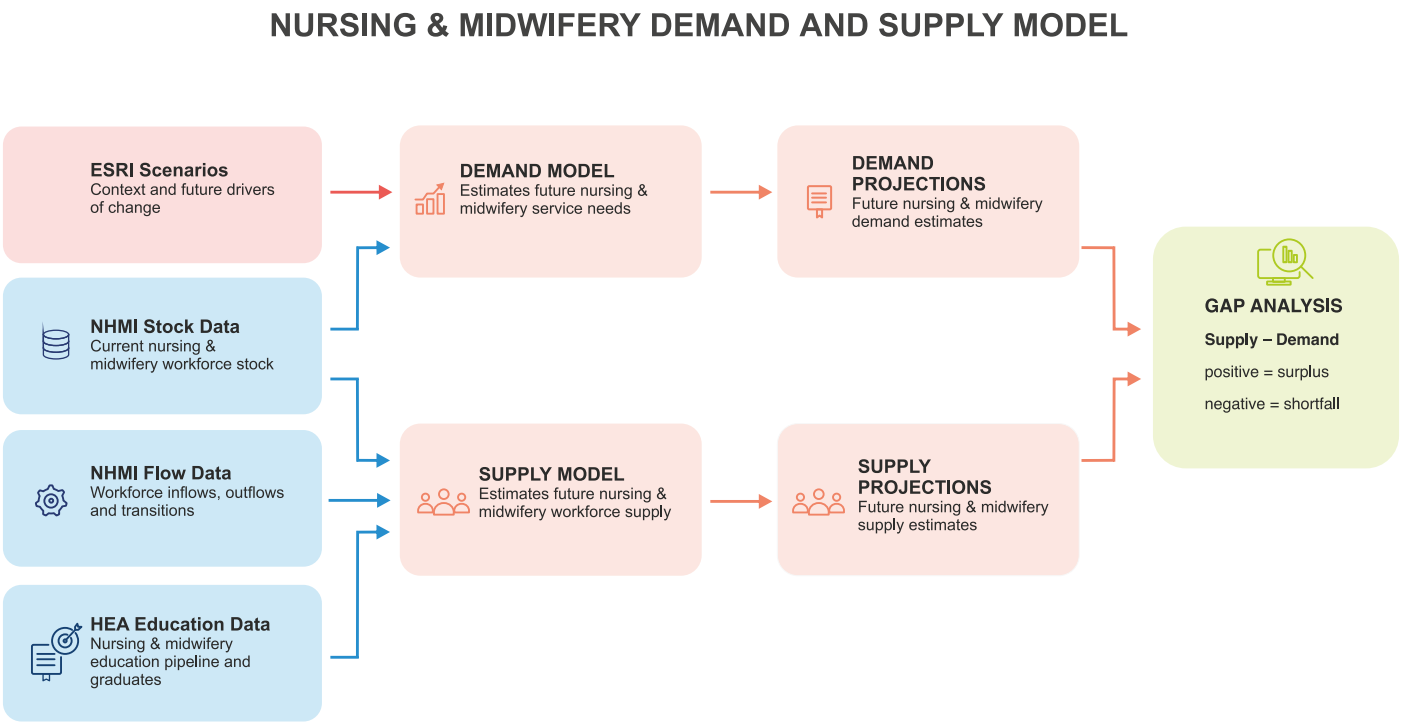

Figure: Nursing & Midwifery Demand and Supply Model

During JA HEROES, work was undertaken to update the base year of the model from 2021 to 2023, and further quality assure the model and its data inputs. Modelling work has also been initiated to broaden the professional coverage of the models to eventually include all health and social care professions. Additionally, engagement is underway with the National Doctors Training and Planning (NDTP) to better align technical workforce planning modelling on medical specialty training with medical workforce planning at the national level, aligning the modelling outputs of the HSE and Department of Health which brings together system and sector level requirements with clinical specialty requirements.

A review of methods to understand how to integrate qualitative insights and expert input into qualitative modelling exercises was undertaken. Elements of these methods have recently been employed to enable projections of the primary care workforce for the first time.

Within the HSE, the NDTP has well-developed technical capacity for medical workforce planning. The NDTP developed a suite of supply-demand models that underpin the development of speciality specific medical workforce plans. These models are refined and adapted for each specialty in collaboration with the Clinical Programme Leads and HSE National Service Directors. The projection period for specialty reviews is 2038. This long timeframe accounts for the long duration of training and a period of time to ramp up training programmes. The Centre for Health Policy and Management (CHPM), Trinity College Dublin are collaborating with HSE NDTP to develop this specialty specific plans.

HWF Planning Models: HEROES contribution and future directions

There is a need for recently established Health Regions to be involved in some capacity in the modelling process, but the extent of their involvement has yet to be determined. The models are currently focused on single health occupations, but it is envisioned in future developments of the models that can move to interprofessional workforce planning. There are some occupations linked; the demand for Health Care Assistants can be calculated based on an agreed ratio to Staff Nurse levels. The demand of Advanced Practice Nurses/Midwives is linked to a target percentage of the stock of Staff Nurses/Midwives. Further work is required to incorporate substitution effects and to ensure that all nursing related professions are modelled as a group rather than in siloes.

Looking beyond JA HEROES, modelling capacity is expected to increase significantly with the support of internal and external stakeholders and through the efforts of the professional regulators to improve the availability and quality of data on their respective registers. This will inform workforce planning and coordination throughout the life cycle of a health and social care worker from the higher education system, through clinical practice placements and on to training in advance practice, specialisation and other career pathways.

The coverage of professions is expected to expand to include all regulated professions over the coming years including Dietitians, Radiographers, Radiation Therapists, Speech and Language Therapists, Medical Scientists, Podiatrists, Physiotherapists and Social Care Workers.

Feedback on the HWF models have highlighted the need to incorporate a wider range of scenarios, policies and reforms into the projections. The current approach incorporates the effects of policies where they are of significant impact, but only where sufficient data and research exist to parameterise their impact with sufficient evidence. Increasingly qualitative methods and expert elicitation will be incorporated to enable an expanded range of ‘what-if’ modelling scenarios and to overcome limitations of data quality and availability. This will support aims to reform and optimise the workforce and health system within existing resources.

There is a need to work towards a system where workforce planning, and multidisciplinary education are designed to meet population, and patient needs and to move away from the traditional siloed approach. The plan is to create a strong and reliable minimum data set with an aim to improve modelling, governance and planning capabilities within the Department of Health.

As new data becomes available, this will inform the demand and supply modelling. The plan is to deliver projections for more regulated professions along with a disaggregation of medical and nursing professions, which will outline the medium- and long-term demand and supply projections along with a gap analysis.

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There were many stakeholders involved within the design of the health and social care models, and there are plans for a technical group with the Department of Health taking a leadership role to guide and coordinate the planning process in collaboration with key stakeholders and making them co-owners of the inputs and scenarios. These stakeholders include the HSE, the professional regulators, Department of Further and Higher Education, Department of Children, Disability and Equality, Department of Education and Youth and the Higher Education Authority.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

Sustainably building the future health and social care workforce requires long-term planning, innovation, and significant cross government investment. As roles evolve and new competencies emerge, lifelong learning will become increasingly important. Since 2022, higher education institutions have worked with Government to expand training places in priority disciplines, but further growth requires more clinical practice placements, infrastructure, and forward planning. A whole of government response — across education, health, disability, and social sectors — is essential to ensure training capacity aligns with future workforce needs.

Health spending in Ireland has grown substantially, rising 94% since 2018 to €27.4 billion in Budget 2026. Acute care spending has doubled since 2016, and overall health expenditure already sits well above the OECD average relative to national income. As the population ages, age-related healthcare costs will rise faster than in many other countries, posing long-term sustainability challenges. Improving productivity and value for money is central to meeting growing demand, especially as expectations rise and workforce related costs increase. Major reforms — including Health Regions and digital transformation — aim to enhance efficiency and patient outcomes while ensuring the workforce strategy delivers maximum public value.

Planning for a health and social care workforce in Ireland is not only a matter of determining the right numbers required but also requires a vision on the right match between skills available in the workforce and patients' needs. Under the JA HEROES, work contributed to strengthening the minimum data set with an aim to improve modelling, governance and planning capabilities within the Department. As new data becomes available, this will inform the demand and supply modelling.

The paper "Ireland's Future Health and Social Care Workforce" provides a roadmap for how work can be done to build on the recent investment in both workforce and student places and to develop more advanced planning capabilities built on strong data and research. This will be an iterative process. Communication and engagement with all relevant stakeholders will allow for the creation of clear channels of information sharing, which will allow these models to inform decision-making and identification of appropriate policies and strategies to address future workforce challenges. This paper was developed during the time of the JA HEROES project incorporating learnings and building on the engagements as part of this. The paper is a demonstration of Ireland's commitment to sustainability and policy impact by setting an evidence-based strategic direction, through clear actions, for the health and social care workforce for the next 15 years.

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COUNTRY REPORT ITALY

6.3 COUNTRY REPORT: ITALY

Introduction

National HWF Planning System before HEROES

Italy faces important HWF challenges, which have been highlighted in recent European Semester cycles. The dual challenge of **population ageing,** combined with an **ageing healthcare workforce,** contributes to growing imbalances across professional groups and persistent **geographical disparities** between northern and southern regions. These pressures were only temporarily mitigated by extraordinary regulatory measures adopted during the COVID-19 pandemic, such as delayed retirements. Effective HWF planning plays a central role in supporting healthcare reforms by ensuring that the right mix of skills and professions is available to meet evolving care needs and service delivery models. By aligning workforce capacity with demand, it helps improve access, efficiency, and quality of care. Ultimately, a well-functioning health system supported by an appropriately skilled workforce is a key enabler of population health and thus contributes to overall productivity and economic competitiveness.

Italy has a formally established national HWF planning system, characterised by a strong multi-level governance structure and significant territorial heterogeneity. Central responsibility for human resources for health (HRH) policies lies with the Ministry of Health, specifically within the Directorate General of Health Professions and Human Resources for the National Health Service. Within this Directorate, the Office for Health Professionals' Needs and Training coordinate the national planning process, covering **30 regulated healthcare professions** (on an annual basis), general practitioners (annually), and **51 medical specialties** (every three years, with annual allocation of post-graduate medical training posts). Italy recognises 31 health professions, including osteopathy; however, due to the ongoing completion of the professional register/implementation framework, osteopaths are not yet included in the ordinary national HWF planning cycle. The Italian system reflects the institutional architecture of the National Health Service, in which 1**9 Regions and two Autonomous Provinces** hold primary responsibilities for organising, delivering and planning healthcare services, and therefore play a key role in workforce planning. While this decentralised framework allows for adaptation to local needs, it also generates substantial differences across territories in organisational models, planning capacity and technical expertise.

From a data and evidence perspective, Italian HWF planning relies on a broad, but **fragmented set of information sources,** collected and managed by multiple institutions for different purposes. The Ministry of Health draws on data from the Ministry of Economy and Finance, the Ministry of University and Research, the National Institute of Statistics (ISTAT), social security institutions, professional orders and chambers, and the national continuing professional development system (Co.Ge.A.P.S.), among others. Available data cover workforce stock and flows, including demographic characteristics, professional qualifications, employment status, education and training pathways, labour market inflows and outflows, and aggregated demand indicators based on demographic projections.

However, **the lack of a single integrated database,** limited availability of full-time equivalent (FTE) data, insufficient information on medical specialties and international mobility, and legal constraints related to data protection remain major challenges.

Prior to HEROES, Italy introduced two main complementary approaches to HWF planning. Both require joint efforts across stakeholders for data collection, validation, and integration. The first is a **forecasting model** running both at the national and regional level through a quantitative "stock and flow" approach, developed as a result of the first European Joint Action on HWF Planning and Forecasting (2013-2016). This forecasting model was primarily used to **inform decisions on education and training needs** to the basic degree courses of **30 health professions**. However, it is not used to estimate the future needs of medical specialties. The model is applied **annually** at both regional and national levels and produces **medium- to long-term projections of workforce supply and demand**, allowing for scenario analyses and supporting institutional dialogue among the Ministry of Health, Regions and professional regulatory bodies responsible for licensing and maintaining professional registers. The final allocation is adopted through the formal education planning process led by the Ministry of University and Research (MUR), informed by the proposal endorsed through State–Regions coordination and constrained by training capacity and financial considerations.

The second approach has been developed by AGENAS (the National Agency for Regional Health Services) a **national system to estimate HWF staffing needs** within public healthcare organizations (called AGENAS methodology, formalized with the Interministerial Decree of 24 January 2023). In 2021, AGENAS established a dedicated working group with the objective of developing a methodology for determining NHS workforce needs. The methodology was developed in implementation of Article 11 of the Italian Decree-Law 35/2019 and approved by the Ministry of Health in agreement with the Ministry of Economy and Finance and the State-Regions Conference in December 2022.

The methodology supports the estimation of staffing requirements by profession, specialty and area of activity, both in hospital care and Integrated Home Care (ADI), and was designed in coherence with the national hospital reorganisation framework established by Ministerial Decree No. 70/2015 ("Regulation laying down qualitative, structural, technological and quantitative standards relating to hospital care"), with the aim of estimating workforce needs by profession, specialty and area of activity. These estimates represent the basis for planning training needs and for identifying areas of activity that are understaffed in terms of human resources.

Importantly, the estimation of staffing needs through this methodology became a prerequisite for regions to access to the additional hiring capacity corresponding to 5% of the annual increase in the Regional/National Health Fund, subject to the application of the methodology and financial balance constraints. In this sense, the methodology represents a key policy instrument to progressively overcome the historical expenditure ceilings applied to NHS personnel expenditure over the last two decades, while strengthening medium-term forecasting and predictive capacity on workforce needs, supporting training planning, service planning and organisational development, and reducing the risk of workforce shortages.

Overall, the Italian HWF planning system combined a solid legal and technical foundation, demonstrating the technical feasibility of more comprehensive information systems, while also highlighting the need for greater integration, standardisation and systematic use of data to support planning decisions. The main criticalities regarded a largely unstandardised approach to demand estimation, few links to epidemiological needs and care delivery models, limited integration of planning competencies across actors, and a strong reliance on negotiated processes.

Key features of the Italian HWF planning system before HEROES

- National multi-level governance structure
- Workforce planning covering **30 regulated professions** and **51 medical specialties**
- Strong regional autonomy with significant territorial heterogeneity
- Existing forecasting capacity based on stock-and-flow models
- Fragmented data ecosystem and limited integration of demand-side indicators

HEROES: Key Achievements

During HEROES (2023-2026), Italy successfully achieved the following key milestones in strengthening its HWF planning system:

2023-2024: Refinement and pilot-based consolidation of the AGENAS staffing model

Between 2023 and 2024, the AGENAS methodology for determining staffing needs at the organisational level was refined based on evidence emerging from pilot implementation in nine regions. Key improvements included the identification of critical issues, the establishment of a permanent working group, and the progressive enhancement of data inputs. This phase strengthened the model's capacity to identify current workforce gaps in full-time equivalents and increased its comparability across regions and across healthcare organisations within regions.

2024: Benchmarking and design of advanced demand-side indicators

In 2024, Italy completed a benchmarking exercise comparing national approaches to defining HWF demand with practices in selected European countries with more mature planning systems. Based on this work, the HEROES Italian partners initiated the design of a comprehensive set of quantitative and qualitative indicators to better capture demographic, epidemiological, service utilisation and organisational determinants of workforce demand. This paved the way for enhancing the analytical robustness of demand estimation.

2024-2025: Operational progress towards an integrated statistical information system on HWF supply

In 2024-2025, significant operational progress was achieved in extending the individual-based integrated statistical information system for health professionals, previously implemented as a pilot study on two healthcare professions (pharmacists and physiotherapists). The system, coordinated by ISTAT (the Italian National Institute of Statistics), includes major professional groups such as doctors, dentists, nurses, midwives, physiotherapists and pharmacists, who represent over 70% of the total healthcare workforce. New analytical data allow distinctions by employment status, sector, contract type, training pathways and activity status (active, available, inactive), significantly improving the quality and granularity of supply data available for workforce planning and forecasting models.

2025: National capacity-building programme for HWF planners and key stakeholders

In 2025, Italy implemented a national training programme for HWF planners using the HEROES budget, coordinated by AGENAS. The programme combined three online sessions and a two-day in-person workshop and reached a significantly broader audience than originally planned, including regional authorities, local health authorities, hospitals, and professional federations. The training strengthened shared understanding of HWF planning methodologies, data use and stakeholder engagement, reinforcing planners' capacity to interpret models and apply them coherently within policy and organisational decision-making processes.

Co-funded by the European Union

2025-2026: Development of a forecasting model for medical specialty training needs

Between 2024 and 2025, the Ministry of Health developed an agent-based simulation model to forecast medical specialist workforce and postgraduate training needs in Italy. The model overcomes static planning limits by representing physicians as agents whose careers evolve dynamically through defined rules and transition probabilities. It uses a stock-and-flow structure covering entry into specialty training, workforce progression, exits due to retirement or attrition, and selected mobility dynamics. The model is parameterised using official statistical sources, mainly ISTAT data, and tested through alternative scenarios. Pilot simulations for selected specialties validated logic, sensitivity, and the model's capacity to produce consistent medium- and long-term projections, laying the groundwork for further refinement and extension.

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

Over the past three years, Italy has gained significant insights into the effective adoption, implementation, and scaling of HWF planning and forecasting systems. For the adoption stage, the key lesson was the importance of integrating existing models at different levels - **national, regional, and organisational levels**. While full integration has not yet been achieved, HEROES contributed to strengthening alignment between these levels through improved stakeholder coordination, shared methodological discussions, and the development of more interoperable data structures. In particular, the project supported closer interaction between national forecasting activities and the organisational-level staffing methodologies developed by AGENAS. The process highlighted that successful HWF planning requires not only robust technical tools, but also a shared understanding among stakeholders of the objectives and methodologies underpinning workforce projections. In particular, regional actors, while legally involved in planning, needed targeted support and capacity-building to actively contribute to data collection, scenario development, and interpretation of forecast results. One key lesson learned during HEROES is that improving HWF planning is not only a methodological challenge, but fundamentally a data governance challenge. The development of an integrated statistical information system has shown that fragmented supply data can be reconciled only through strong institutional coordination, shared metadata standards and clear rules for data access and protection. Early investment in interoperability and pseudonymised individual-level linkage proved essential to move from approximate workforce counts to analytically robust classifications of active, available and inactive professionals.

During the implementation phase, the HEROES actions revealed the critical value of iterative pilot testing, stakeholder engagement, and continuous feedback. Pilots of the AGENAS staffing model and the emerging MoH forecasting model for medical specialties underscored the necessity of aligning methodological assumptions with available data within the specificities of the context. Lessons learned include the need to balance complexity and usability: models must capture workforce dynamics in sufficient detail to inform policy while remaining comprehensible and actionable for decision-makers at all levels. Furthermore, integrating multi-source data, ranging from registries, training institutions, population demographics, to service utilization, proved essential to enhance predictive accuracy and credibility among stakeholders. Another important lesson concerns the added value of **integrated microdata** for policy-relevant analyses. The possibility to distinguish workforce supply by age, gender, employment status, sector and type of contract has increased awareness of how structural characteristics of employment affect workforce availability beyond headcounts.

The upscaling phase highlighted sustainability and policy integration as central criteria for long-term impact. During HEROES, important progress was made in moving from pilot experiences towards more structured and institutionalised approaches. In particular, the project contributed to strengthening coordination mechanisms, expanding participation of regional stakeholders, and promoting the gradual integration of workforce planning activities into broader **policy and organisational decision-making processes**.

Expanding models to all regions and care settings (ongoing process), integrating demand indicators, and linking organisational-level staffing needs to national forecasting tools showed that technical improvements alone are insufficient: successful scaling requires governance structures, formalised procedures, and continuous training of planners to maintain consistency and comparability across regions. HEROES reinforced that HWF planning is not only a technical exercise but a strategic, collaborative process where transparency, shared indicators, and capacity development are pivotal. HEROES, moreover, contributed to increasing awareness, technical capacity, and comparability of approaches across regions, laying the foundations for broader future adoption. These lessons are guiding ongoing efforts to institutionalise more coordinated, evidence-based, and regionally responsive HWF planning policies in Italy, ensuring preparedness for future workforce challenges.

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

Domain 1: Political and contextual support

Italy has a universal, publicly funded healthcare system - the National Health Service (NHS) - established in 1978 (Law 833/1978) and inspired by the principles of universality, equity and solidarity. The NHS guarantees access to essential levels of care to all residents, largely free at the point of use or subject to limited co-payments. While the system is nationally defined in terms of principles, entitlements and funding mechanisms, its organisation and delivery are highly decentralised. Legislative reforms over the past decades have progressively transferred substantial responsibilities to the 19 Regions and two Autonomous Provinces, which are entrusted with planning, organising and delivering healthcare services within their territories. Healthcare provision is predominantly public, but it is complemented by accredited private providers that operate within the NHS framework and are reimbursed with public funds. This mixed public-private configuration, combined with strong regional autonomy, represents a defining feature of the Italian healthcare system and has a direct impact on HWF planning.

The decentralised governance structure shapes the HWF planning process by requiring continuous coordination between national and regional levels. While the Ministry of Health retains responsibility for defining national health policies, regulatory frameworks and overall funding allocation, regions play a central role in translating these policies into service delivery models and workforce requirements. Regional authorities are responsible for defining regional health plans, determining the organisational configuration of services, managing public healthcare providers, and regulating relationships with private accredited providers. As a result, workforce needs are influenced by region-specific factors such as demographic trends, epidemiological profiles, geographical characteristics, and organisational models of care. This diversity necessitates the systematic involvement of regional stakeholders in the planning process and explains why the national forecasting system incorporates regional-level data collection and validation. At the same time, regional heterogeneity poses challenges in ensuring coherence, comparability and alignment of assumptions across territories, particularly when estimating future demand for healthcare professionals.

Another contextual feature influencing HWF planning in Italy is the separation of responsibilities between the healthcare and education sectors. While the Ministry of Health coordinates workforce planning and identifies training needs, the Ministry of University and Research is responsible for regulating higher education and determining the number of training places in universities and medical specialty schools. This institutional separation requires complex inter-ministerial coordination and creates a structural gap between workforce planning outputs and education policy decisions. Although the results of the national forecasting model inform decisions on training intakes, they represent only one of several elements considered in the final allocation of places, alongside universities' training capacity, financial constraints and broader public interest considerations. In practice, workforce forecasts provide an important technical reference for discussions between the health and education sectors, although final decisions remain the result of broader institutional and financial considerations. This configuration limits the direct enforceability of workforce planning results and reinforces the importance of negotiated and consensus-based processes involving multiple institutional actors.

The Italian healthcare system also faces structural pressures that strongly affect workforce planning dynamics. Population ageing, combined with the increasing prevalence of chronic conditions and multimorbidity, generates growing and evolving demand for healthcare services, particularly in primary care, long-term care and community-based settings. At the same time, the healthcare workforce itself is ageing, with a significant proportion of professionals approaching retirement age, particularly in certain professions such as nursing. These trends are compounded by persistent geographical imbalances in workforce distribution, with shortages more pronounced in southern regions and in rural or remote areas. Financial constraints, particularly within the public sector, further limit the capacity to respond to these challenges.

Finally, the complexity of the Italian healthcare system requires the involvement of a broad range of stakeholders in HWF planning. In addition to national and regional authorities, professional orders and chambers play a legally recognised role by providing data from professional registers and contributing their perspectives on workforce needs. Technical agencies such as AGENAS and ISTAT support the process through methodological development and data production, while universities and training institutions influence the supply side of the workforce. This multi-actor environment reflects the pluralistic nature of the NHS, but also increases the need for coordination, shared analytical frameworks and common planning competencies. Within this context, health workforce planning in Italy operates as a negotiated, evidence-informed process embedded in a decentralised and mixed healthcare system, where contextual factors significantly shape both the methods used and the feasibility of policy implementation.

Domain 2: Human Resources for Health (HRH) governance

The General Directorate for Health Professions and Human Resources of the National Health System at the Ministry of Health is responsible for coordinating the national process aimed at periodically deciding on the number of students to be admitted to higher education courses for healthcare professions and medical specialties. All these activities are established by Italian law and require a complex and well-structured stakeholder involvement because the final decision represented an agreement between the actors involved in the process: ministries (**Ministry of Health**, **Ministry of University**, and **Ministry of Economy and Finances**), regions and autonomous provinces (**19 Regions and 2 Autonomous Provinces**), professional associations (**10 professional associations**).

The table below shows the key stakeholders in the Italian HWF planning process. Most of them are grouped into categories for ease of reading. In the table below, “I” refers to the level of stakeholder interest, while “P” refers to the level of stakeholder power or influence within the HWF planning process.

	Name of the stakeholder (grouped)	Involvement in the HWF planning process	DATA		PROCESS		SKILLS	
			I	P	I	P	I	P
A	Regions	Already involved	H	L	H	L	H	H
B	Health Professionals Orders	Already involved	H	H	H	L	H	H
C	Ministry of Health	Already involved	H	H	H	H	H	H
D	Ministry of University and Research	Already involved	H	H	L	H	H	L
E	Bodies and commissions regulated by the Ministry of Higher Education and Research	Not yet involved	H	H	H	L	H	L
F	Ministry of Finance	Already involved	H	H	L	H	L	L
G	Social Insurance Institutions for Health Professions	Already involved	L	H	L	L	H	L
H	CPD Health Professions Register Consortium (Co.Ge.A.P.S.)	Already involved	H	H	L	H	L	L
I	Trade Unions	Not yet involved	L	L	H	L	H	L
L	National Agency of Employers in the Public Sector	Not yet involved	L	L	H	L	H	L
M	National Institute of Statistics (ISTAT)	Already involved	H	H	H	L	H	H
N	Patients Associations	Not yet involved	H	L	L	L	H	L
O	Private Providers Associations	Not yet involved	H	L	L	L	H	L
P	Public Providers Associations	Not yet involved	H	L	L	L	H	L
Q	National Agency for the Evaluation of the Higher Education and Research System	Not yet involved	H	L	L	L	H	L
R	National Agency for the Regional Health Services	Not yet involved	H	H	H	L	H	H

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

The stakeholder landscape involved in HWF planning in Italy is broad and institutional in nature, encompassing national and regional public authorities, professional regulatory bodies, technical agencies, and organisations linked to education, labour market regulation and data production.

HWF planning in Italy is characterised by a structured but selective involvement of stakeholders, reflecting the legal, institutional and governance-based nature of the National Health Service. Core responsibilities are concentrated within public authorities and legally recognised bodies, while other actors exert indirect or contextual influence on planning outcomes. The Ministry of Health, through the Directorate General for Health Professions and Human Resources, holds primary responsibility for coordinating the HWF planning process, designing forecasting tools, collecting and integrating data, and facilitating institutional dialogue. Its interest and power are high across all dimensions - data, processes and tools, and planning skills -given its formal mandate and central role in defining national policy orientations.

Regional authorities also play a key role, as they are legally required to participate in setting training quotas and to provide regional-level data and analyses. Their interest in HWF planning is generally high, particularly with regard to public sector workforce needs, as regions directly manage healthcare service delivery. However, their power to modify planning tools and processes is more limited, since these are defined at the national level. By contrast, regions retain significant potential power to strengthen planning skills, as they may autonomously invest resources to build technical capacity.

Professional orders and chambers represent another central stakeholder group. Their participation is regulated by law, and their interest and power are high in relation to data collection, as they manage professional registers, and in expressing profession-specific workforce needs. Their influence on HWF planning processes and tools is more limited, as methodological choices remain largely under governmental control.

The Ministry of University and Research plays a decisive role at the interface between HWF planning and education policy, with strong power over the final allocation of training places and high interest in data related to students and graduates. Although not responsible for forecasting future healthcare workforce needs, its decisions significantly shape the supply side, explaining its high classification in terms of power within the planning system. Similarly, the Ministry of Finance exerts strong influence through budgetary control, public personnel expenditure limits and funding of postgraduate training, resulting in high power but comparatively low interest in planning tools and skills, given its monitoring-oriented mandate.

Several stakeholders contribute indirectly or in a supportive capacity. Technical bodies such as **ISTAT** and **Co.Ge.A.P.S**. have high interest and power in data production and quality improvement, but do not participate in decision-making on training quotas. **AGENAS**, while not formally responsible for national planning decisions, has gained increasing relevance through its analytical role and the development of staffing needs and standards, particularly on the demand side. Conversely, local health authorities and individual healthcare providers are not directly involved in national HWF planning. Their limited interest and power stem from the fact that planning decisions are taken at national and regional levels, while providers mainly operate within constraints set by regional budgets, staffing ceilings and organisational rules. Other actors, such as trade unions, patient organisations and provider associations, are not institutionally embedded in the planning process; their influence is indirect and mainly linked to working conditions, service accessibility and workforce availability. This differentiated allocation of roles explains the observed distribution of interest and power among stakeholder groups and underpins **the negotiated yet government-led nature** of the Italian HWF planning system.

Domain 3: HWF planners' capabilities

Actors involved in this process have distinct expertise: the Ministry of Health is responsible for health policies and healthcare funding at the national level; regional authorities know regional healthcare delivery models and regional healthcare policies; professional orders deal with professional policies and professional development. These diverse backgrounds should be integrated during the planning process to guarantee information alignment across actors.

Three **layers of skills** are needed to execute planning activities. The first layer is **technical**. Planners need basic computer skills as a preliminary requirement. Moreover, they should comprehend the formulas and algorithms used in the forecasting and planning model and understand the functioning of the process for healthcare workforce planning. Regarding data, they should be able to manage and interpret data, especially discern and select the appropriate data for the question at hand. The skills available in this area are heterogeneous, and the convergence and integration of different skill sets would benefit the whole process. In this domain, especially at the regional level, the skill of interacting and coordinating the efforts of IT personnel is considered crucial, but not consistently in place at present.

The second layer is related to the broader **knowledge of the healthcare sector**. Planners should be aware of general healthcare system trends, reforms, and financing to understand the implications on the demand for personnel. They should also know regional and institutional healthcare delivery models, organizational features, and professional roles and domains. This is understood as general knowledge rather than an operational capability required to understand and build interactions across policy sectors. Nonetheless, assessing the labor market and financial implications of planning processes is considered a pivotal capability and is localized often in other organizational units in regional authorities.

The third layer regards **personal competencies**, such as **relational capabilities**. These are highlighted as the most important since the process requires significant interactions between actors. HWF planning is considered chiefly technical but requires coordination effort. Currently, the ability to involve other relevant actors is not very present at the regional level, for instance, when dealing with local health authorities personnel offices. This ability should also translate into how to strategically steer local healthcare organizations within the regional context towards developing personnel policies coherent with the outcomes of the regional planning process. Another critical aspect is the frequent staff turnover, especially at the regional level, that requires introductory training for newcomers every year. Competencies or organizational features at regional level have not been standardized yet. Regional planners are also often influenced by their own knowledge and expertise, which is positive, yet high turnover rates might impede the building of more ample knowledge and experience.

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

During the HEROES Joint Action, Italy successfully implemented a comprehensive training programme aimed at strengthening the capabilities of HWF planners across regional authorities, professional federations, and other relevant institutions. The training activities encompassed three online sessions and two in-person workshops. Overall, approximately 100 professionals took part in at least one training activity, significantly exceeding the initial target of 35 participants. Among them, 36 participants completed the full training pathway, attending all five sessions. The high level of participation reflected strong interest and engagement from regional officers, human resource managers, professional order representatives, hospital directors, and other relevant stakeholders. Before starting, the course was adapted to account for such larger audience.

HEROES training programme in Italy

~100 professionals participated in at least one activity

36 participants completed the full training pathway

Participants included:

- regional authorities
- hospitals
- professional federations
- HR managers
- healthcare organisations

The training sessions, held between May and June 2025, covered key topics directly linked to the ongoing development of HWF planning systems in Italy. These included the reflection on the present and future of HWF planning, the methodology for determining staffing needs at the organisational level, the use of workforce and data planning tools, professional skill-mix changes, and the dynamics of healthcare personnel across regions and care settings. The sessions also offered interactive expert roundtable discussions, involving stakeholders with different roles in the healthcare system, enabling participants to consolidate their understanding of the contextual variables influencing HWF planning and to share experiences across regions and professional groups. The roundtables facilitated exchanges among experts with different institutional roles and perspectives. Teachers included a mix of researchers and practitioners, coming from different institutions and having different mandates in relation to HWF planning.

Through these sessions, participants strengthened their skills in several critical areas. From a technical perspective, they developed greater confidence in using current planning tools, interpreting workforce data, and understanding the integration of supply-demand models at both national and regional levels. Planners also enhanced their knowledge of regulatory frameworks, workforce governance, and the operational dynamics of hospitals and community care settings. On the collaborative side, participants understood opportunities to engage stakeholders effectively, including regional authorities, professional orders, and hospital management, promoting multi-level dialogue and consensus-building. These capabilities directly support the ongoing implementation of the AGENAS staffing methodology and the integration of the forecasting models in the Ministry of Health, ensuring that workforce planning decisions are evidence-informed and aligned with policy goals.

The scope of the training focused on areas of biggest priority. The sessions provided a solid foundation for continued capacity development. Key outcomes included a clearer understanding of stakeholder engagement processes, improved mastery of workforce data and planning tools, and enhanced ability to analyse and interpret workforce projections in the context of regional and national needs. These training activities are designed to have lasting impact beyond HEROES. The knowledge and methodologies shared during the courses can be continuously applied in HWF planning cycles at both regional and national levels. The structured sessions, combining online and in-person learning, provided a replicable model for future trainings, ensuring that new personnel can be integrated effectively into the planning process and that existing staff can maintain and enhance their skills as the workforce planning system evolves.

These training activities will have a lasting impact beyond the HEROES Joint Action. To ensure continuity, further editions of the training programme are planned on a regular basis, targeting professionals involved in HWF planning. The objective is to periodically update and strengthen the collective knowledge and skills of the relevant actors, ensuring that the right competencies are available as HWF planning processes evolve and as institutional responsibilities and personnel change.

In conclusion, the HEROES training programme in Italy has successfully contributed to strengthening the technical, analytical, and collaborative skills of HWF planners, creating a more informed and capable community of practice. The action established a sustained culture of training, fostering continuous training culture and capacities that are likely to have a lasting impact. Investment in skills under HEROES was fundamental in reinforcing the country's ability to anticipate workforce needs, manage staffing gaps, and respond proactively to changing healthcare demands.

Domain 4: HWF data and models

HWF Data: Sources

HWF planning in Italy relies on a wide range of data sources supplied by multiple national institutions, reflecting the **fragmented but information-rich** nature of the system. On the supply side, the main data suppliers include the Ministry of Health, the Ministry of Economy and Finance, the Ministry of University and Research, ISTAT (National Institute of Statistics), professional orders and colleges, social insurance institutions for health professions, and Co.Ge.A.P.S. Additional analytical support is provided by the statistical units within the Ministry of Health and the Ministry of University and Research, as well as by AGENAS. Supply data used in HWF planning include information on the total professionally active stock and its distribution by profession, region, age and gender; average retirement age; students in training by course, region and institution; drop-out rates; and numbers of graduates. Both **individual-level data** (used to describe the active workforce and model inflows and outflows such as labour market entry, retirement, death and inactivity) and **aggregated data** (e.g. students in training or inactive professionals) are employed in the forecasting process. On the demand side, data availability is more limited and primarily based on aggregated demographic indicators. The forecasting model uses population census data and demographic projections by age, gender and region provided mainly by ISTAT to approximate current and future demand for healthcare services and, indirectly, workforce needs.

No standardised, **profession-specific demand indicators** linked to epidemiological, or service delivery data are systematically used at national level. Regarding mobility, inflow data on **foreign-trained, foreign-born** and **foreign-national professionals** are derived from professional registers, while outflows related to emigration are approximated through proxy indicators, such as the number of qualification recognition certificates issued by the Ministry of Health. Overall, while data availability on workforce supply is extensive, its use for planning purposes requires substantial **integration** and **reconciliation** across heterogeneous sources.

Advanced Minimum Data Set: achievements under HEROES

Throughout HEROES, several data improvements were implemented. First, there was a concerted effort to collect and harmonize data on medical specializations, headcounts, age and gender distribution, and training. This is the main improvement on the supply side, which was already quite extensive. On the demand side, existing data on population age and gender distribution, as well as on healthcare consumption, can now be incorporated in the planning model. Qualitatively, the model can now account for organizational, epidemiological, and technological changes across regions and professions. This data will be collected on an ad hoc basis with stakeholders' consultations. Furthermore, the most significant improvement to data availability that happened during HEROES is not necessarily shown in the table below. ISTAT carried out an extensive collection and connection of individualized data on healthcare professionals across several professions. While this will not extend the type and scope of available data, information on healthcare professionals is now more accurate, reliable, and encompassing, even with professionals operating beyond traditional public healthcare organizations. The future development of this statistical information system aims to include all healthcare professions, extend the data to medical specializations, to include the cross-country migration status of professionals and to count professionals also in terms of full-time equivalents, which will provide robust and comprehensive data as a basis for the forecasting model in the coming years.

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Advanced Minimum Data Set

Quantitative data set	Supply side					Demand side	
	Labour force	Training	Retirement	Outflow migration	Inflow migration	Population	Health consumption
Profession	X	1	X	X	X		
Age	X	X	X	X	X	X	X
Head count	X	X	X	X	X	X	X
FTE	1						
Geographical area	X	X	X	X	X	X	X
Specialisation	2	X	X	X	X		
Country of first qualification	X			X	X		
Gender	X	X	X	X	X	X	X
	1* The National Head Count of Public administration included FTE data during HEROES. 2* Currently data about specialisations is not homogeneus and cannot be used for planning. In the future it is more likely that we will have data only on phsysician specialisations.	1* Data is based on University Courses that allow practising a profession	The only data available is from OECD an only for physician and nurses				

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

Legend:

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 or during HEROES

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HWF Data: improvements

During the HEROES Joint Action, Italy has implemented substantial improvements in the availability, quality and use of HWF data, addressing both the demand and supply sides of workforce planning. These actions aimed to overcome long-standing fragmentation of data sources and methodological limitations in forecasting models, while strengthening the evidence base for policy-relevant planning decisions.

Key HWF data achievements under HEROES in Italy

- Improved availability and harmonisation of data on **medical specializations,** training pathways and workforce distribution
- Integration of **demographic and healthcare utilisation data** into national forecasting models
- Development of broader demand-side dimensions, including:
  - organisational changes
  - epidemiological trends
  - technological innovation
- Expansion of the **ISTAT integrated statistical information system** for health professionals
- Enhanced identification and classification of:
  - professionally active professionals
  - available and inactive professionals
  - professionals working outside traditional public healthcare organisations
- Strengthened analytical basis for future workforce forecasting and planning activities

A first major achievement concerns the improvement of demand-side data through the critical reassessment of traditional forecasting approaches. Historically, national HWF forecasts in Italy have relied mainly on **population-based ratios**, implicitly assuming stable relationships between population size and workforce needs. Within HEROES, this assumption was systematically reviewed, highlighting the need to better reflect demographic, epidemiological, organisational and technological drivers of workforce demand. As a result, the HEROES Italian team launched a structured action to develop **profession-specific and population-based demand indicators**, capable of capturing the complexity of healthcare needs across regions and care settings.

During HEROES, key preparatory activities for this action were completed. These included the mapping of methodologies used by professional federations and scientific societies, a review of scientific and grey literature, and an **international benchmarking exercise** focusing on countries with advanced HWF planning systems, such as Norway, the Netherlands and others. In parallel, a conceptual framework for a comprehensive set of demand indicators was developed, combining quantitative indicators (demography, epidemiology, service utilisation, service capacity, quality and accessibility) with qualitative indicators related to organisational models, technological adoption, health policies and socio-economic factors. Importantly, this effort included stakeholders' consultations and academic literature analysis.

A second major improvement concerns the supply side of HWF data, through the development of an **integrated statistical information system** coordinated by ISTAT. Building on a pilot project initiated before HEROES, the system integrates **pseudo-anonymised individual-level data** from professional registers, labour market sources, population census and education databases. During HEROES, this system was expanded beyond the initial pilot professions, with concrete progress towards covering doctors, dentists, nurses, midwives, pharmacists and physiotherapists. The integrated system significantly improves the ability to distinguish between **licensed, professionally active, available** and **inactive professionals**, and allows analyses by age, gender, employment status, sector and training pathways (link: I professionisti sanitari attivi – Anni 2021-2023 – Istat).

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HWF Data: HEROES contributions and future directions

Looking beyond HEROES, Italy plans to consolidate, scale up and institutionalise the data improvements achieved, ensuring their sustainability within the HRH Data & Models domain and their effective translation into policy-making processes.

On the demand side, the immediate next step is the implementation of a pilot project to test the newly defined set of **demand indicators** in selected regions by the end of 2026. The pilot will integrate these indicators into the existing national forecasting model used to estimate training needs for health professions. It will also support the progressive adaptation of selected components of the **SANDEM model** developed by the Joint Research Centre (JRC), with the aim of building demand scenarios based on health service utilisation, disease burden and disease burden with healthy ageing assumptions, using more granular national and regional data. It will assess feasibility, data availability, interpretability and policy relevance, and will include a structured evaluation of results and lessons learned. Based on this evaluation, recommendations will be formulated for scaling up the indicators to national level and for their routine use in workforce planning.

A key sustainability action is the integration of demand indicators into regular information flows and reporting systems. By 2026, a **structured and continuous reporting mechanism** is planned, allowing periodic updates of demographic, epidemiological and service-related variables relevant to workforce demand. This will support transparency, comparability across regions and long-term monitoring of trends. National guidelines for data harmonisation, regulatory provisions for regular regional data submission, and formal agreements with professional federations are foreseen to ensure consistency and durability over time.

On the supply side, future plans focus on completing and extending the integrated statistical information system for health professionals. By 2026, the system is expected to provide consolidated data on active, available and inactive professionals for the main health professions, with the possibility of extending coverage to additional professional groups. The release of structured outputs for forecasting models and staffing methodologies will further strengthen the link between statistical data and planning tools. In parallel, work will continue improving data on international mobility, medical specializations, employment conditions and freelance professionals, addressing remaining gaps in workforce monitoring.

From a policy perspective, sustainability will be reinforced through the **formal inclusion** of these data tools and indicators in national HWF planning frameworks. Continued collaboration between ISTAT, AGENAS, the Ministry of Health, regions, professional federations and other stakeholders will be essential to maintain alignment, address data quality challenges and ensure that evolving policy needs are reflected in data systems.

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

Italy applies two main and complementary HWF planning models, reflecting a dual approach focused respectively on education-based workforce forecasting and organisational staffing needs.

Model	Main objective	Main level	Main function
Ministry of Health forecasting model	Estimate future workforce supply and training needs	National and regional	Long-term workforce forecasting
AGENAS staffing needs model	Estimate organisational staffing requirements	Organisational/ regional	Demand-side staffing assessment in FTEs

The first model is the national HWF forecasting model managed by the Ministry of Health. This model was technically developed by the Ministry of Health during the previous EU Joint Action on HWF Planning and Forecasting (2013-2016) and was institutionalised at national level in 2015. Its primary policy objective is to support evidence-informed decisions on education and training intakes for health professions, ensuring the long-term sustainability of workforce supply. The model is applied nationally and regionally and covers **all 30 regulated health professions**. It focuses on the whole healthcare labour market, with particular relevance for the public sector.

Technically, the model is a quantitative **stock-and-flow model** based on headcounts of active professionals. Future workforce capacity is projected by modelling inflows (graduates entering the labour market, activation of inactive professionals, international inflows) and outflows (retirement, mortality and inactivity), using age and gender specific probabilities. Supply projections rely on both individual and aggregated administrative data. On the demand side, future needs are approximated using aggregated demographic projections combined with stakeholder provided assumptions on future workforce requirements. Demand estimation is therefore largely **scenario-based and expert-driven** rather than grounded in standardised epidemiological or service-utilisation indicators. The gap between supply and demand is not defined through explicit vacancy rates or unmet needs; instead, the model implicitly assumes equilibrium in the base year and identifies future imbalances by comparing projected supply and demand trends over time. The model primarily supports training inflow regulation, informing annual and multiannual decisions on student admissions to university courses. It operates mainly at the level of single professions and does not explicitly address skill mix changes, task shifting, productivity, working hours or cost containment policies. Formal evaluations of the model have not been conducted; however, its continued institutional use reflects its perceived policy relevance despite recognised methodological limitations.

The second model is the national staffing needs model developed by AGENAS, from 2021 onwards. It was designed to address a key policy gap by providing a standardised approach to estimating workforce needs on the demand side, at the organisational level, particularly within the public sector. The system applies to public healthcare providers and has been tested across several regions in both hospital and home care settings, with the objective of nationwide adoption following the pilot phase.

Unlike the forecasting model, the AGENAS methodology is not a projection tool, but a **normative staffing model**. It estimates workforce needs by defining staffing standards in **full-time equivalents (FTEs)** based on service volumes, organisational characteristics and care settings. Current gaps are identified by comparing existing staffing levels with normative requirements, rather than through vacancy rates or waiting lists. The tool supports policies related to workforce distribution, recruitment and allocation of financial resources, as regions adopting the standards may receive additional funding to address identified staffing gaps. While the methodology does not directly regulate training intakes, it has the potential to inform multi-professional planning, improve demand-side consistency and indirectly support efficiency and equity objectives. As the system is continuously evolving, the methodology is also subject to ongoing revision and refinement in order to progressively improve its accuracy, applicability and responsiveness to emerging organisational and workforce needs.

HWF Planning Models:

HEROES contribution and future directions

The HEROES Joint Action strengthened the coherence and effectiveness of the Italian HWF planning system by improving the integration between existing forecasting and staffing methodologies. A key achievement during HEROES is the improvement and scaling up of the AGENAS methodology for determining HWF needs at the organisational level. Actions have focused on refining the methodology, mapping critical issues emerging from the pilot phase and establishing a permanent working group involving national and regional stakeholders.

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Concrete improvements already underway include the integration of data on actual worked hours made available through the Ministry of Economy and Finances, the extension and the improvement of the model to additional care settings, and the inclusion of further health professions. A central objective of this action is to make the AGENAS methodology available nationwide, providing regions with a unified and comparable approach to estimating workforce needs and identifying staffing gaps in terms of full-time equivalents. The results of the AGENAS methodology could eventually be integrated into the Ministry of Health forecasting model, thereby strengthening the evidence base for national training and workforce policies.

A second major achievement of HEROES is the development of a forecasting model for training needs in medical specialties. While Italy has an established process for periodically defining the number of medical residents, this process has so far relied on negotiations and qualitative assessments rather than on a structured forecasting model. The new action aims to fill this gap by creating a dedicated model that estimates national training needs for medical specialties, eventually incorporating current workforce gaps identified through the AGENAS staffing methodology. Activities include mapping of existing national and European methodologies, reviewing the scientific literature, assessing data availability, and piloting the model for selected specialties and regions. The action also foresees the development of a reference methodological document to support future extensions of the model to other health professions and specialisation pathways.

Looking ahead, Italy's plans to focus on sustainability and institutionalisation of these improvements beyond HEROES. The AGENAS staffing needs model is expected to be progressively adopted by all regions and formally embedded into routine workforce planning and funding mechanisms. The integration between organisational staffing data and national forecasting models is intended to support more consistent policies on training inflows, recruitment and allocation of resources. In parallel, the new forecasting model for medical specialties is expected to strengthen postgraduate training planning and reduce misalignments between education capacity and labour market needs.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

To ensure the sustainability of the HEROES results, Italy is developing an action plan aimed at making the tools and methodologies created through the project structural and permanent. The plan focuses on four strategic lines: political and regulatory consolidation to integrate forecasting indicators into workforce planning processes; institutionalisation of a permanent technical and analytical unit; continuous training and operational guidelines to strengthen planners' analytical and methodological skills; and data harmonisation and information governance to guarantee coherence, interoperability, and data protection. The ultimate goal is to turn the outcomes of HEROES into a stable, transparent, and evidence-based system that supports long-term HWF development policies. In addition, the work carried out under HEROES is fully integrated into the broader EU technical support instrument (TSI) project on HWF, ensuring continuity and further development of its results within a national framework that will remain active beyond the end of the Joint Action.

In this context, a new EU-level initiative on HWF would be essential to sustain momentum and build on the results achieved. Such an initiative could also be strategically linked to the development of the European Health Data Space, an area in which Italy is already strongly engaged and that could provide an important basis for further refining HWF planning activities, particularly in relation to data availability, interoperability and cross-country comparability. This link could allow future projects to benefit from a broader and more robust data foundation, while also improving access to information that is currently not systematically available at national level.

HEROES also demonstrated the added value of structured cross-country collaboration in accelerating national progress on HWF planning. Exchanges with other participating countries supported mutual learning on forecasting methodologies, demand-side indicators, governance models and integrated data systems. At the same time, Italy contributed to the Joint Action through the development of organisational staffing methodologies, integrated statistical approaches and multi-level governance practices. This collaborative environment strengthened institutional learning, facilitated benchmarking activities and reinforced the adoption of more harmonised and evidence-informed approaches to HWF planning across Europe.

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COUNTRY REPORT NORWAY

6.4 COUNTRY REPORT: NORWAY

Introduction

National HWF Planning System before HEROES

Norway's healthcare system is extensive, and almost exclusively publicly funded. The Norwegian population lives very decentralized, and as there is strong political will to give health & care services of equal value to people where they live, the health care delivery is also very decentralized. The spending is among the highest per capita, and there is a higher density of health care workers than in most other European countries.[14] Up until recently it has been possible to expand the health & care services, including by employing an increasing number of staff. Due to the stagnating number of citizens of working age, combined with an increase in the elderly population in need of care, this continued expansion is no longer possible to the same degree.

The Ministry of Health and Care had been aware of this situation for some time, and in late 2021 they tasked an independent commission with writing a report in order to "establish a knowledge basis and propose targeted measures in the years ahead to train, recruit and retain qualified personnel in the health & care services throughout the country in order to meet the challenges in the health & care services in the short and long term.[15]"

The commission's report published early 2023 concluded that the health and care workforce (HWF) could no longer continue to increase its share of the total workforce in Norway to the same degree as before. The Ministry of Health and Care in a later white paper supported this statement.[16]

The commission's report started a public discussion on the sustainability of an ever-expanding HWF, and this coincided with the start of HEROES. There was therefore a lot more attention both in the Ministry of Health and Care and the Directorate of Health, as well as in the health system, paid to HWF planning. Norway participated in the JA EU HWF (2016) and had a minor role in the later SEPEN. Norway already had an established model, and since Statistics Norway was not involved in the JA EU HWF, this did not lead to any changes. This time Norway have taken a more active role in HEROES, co-chairing Work Package 5, and have benefited a lot more from the participation.

The Regional Health Trusts are responsible for specialist health services and for HWF planning in their region. Each of the 357 municipalities in Norway is responsible for delivering primary care services in in their area, and for planning HWF locally. In Norway, the HWF planning process was already working relatively well by 2023, with very good data available, and several forecasting models for HWF needs developed over the years.

14 OECD Data Explorer • Health expenditure and financing
15 NOU 2023: 4
16 NOU 2023: 4

The main challenge was to make better use of the models and to refine some of them (for example provide forecasts from the national level model on regional level), and for staff at municipal level to have more time and resources to use forecasts and other available information to plan ahead. Coordination between the different actors such as Statistics Norway and The Regional Health Trusts could also be improved.

Thanks to HEROES Norway has achieved important results. The Joint Action created a model of cross-country collaboration, which supported quicker progress, which would not be achieved while working in isolation. The action brought HWF planning closer to the forefront of policy attention. Another EU action would benefit consolidation of good outcomes and professionalisation of HWF planning and its full use in policies.

HEROES: Key Achievements

Norway has benefited greatly from the project, and we have amongst other things achieved the following:

2024- 2025: Article on immigrant's usage of health care services

Statistics Norway has produced a scientific study on health & care service usage in Norway by immigrant background, in order to assess whether immigrant status should be included as a factor in the forecasting model (Helsemod). The paper is currently under review in Scandinavian Journal of Public Health.

2023-2025: More comprehensive, accurate and quality controlled data for the national level HWF forecasting model (Helsemod)

Statistics Norway has improved the pipeline for collecting, validating, cleaning, and structuring the necessary data. In addition, they have migrated/redesigned the existing code, switching from SAS Enterprise[17] to R[18]. They have created a repository with shareable code detailing the transformation from source data to input data for the model, including quality checks.

2023-2025: Improvements and recoding of both the supply side, the demand side, and the gap analysis

The national level HWF forecasting model has been improved by Statistics Norway. This has involved quality checks, and improvements to the accessibility and efficiency of the model. These changes make the model easier to manage and improve the conduction of new projections and scenarios. In addition, testing of regional level modelling is undertaken.

2023-2024: Developed a prototype of a dashboard

Statistics Norway has furthermore developed a prototype of an interactive dashboard using Tableau[19] to effectively present and visualize projection results. This can lead to much wider and interactive use of the model, instead of the written reports that are published periodically. The work has included developing scripts/procedures which effectively link the results from the supply and demand sides together, in order to generate tables and figures for a report and prepare data for the dashboard visualization.

17 SAS Enterprise is an analytics platform that enables users to manage, analyse, and visualize data

18 R is an open-source programming language and environment designed for statistical computing, data analysis, and visualization

19 Tableau is a business intelligence and data visualization platform that enables users to explore, analyse, and share insights through interactive dashboards

2026: The code is made accessible

Finally, the code for Statistics Norway's Helsemod model will be published on Github[20], in order to make it publicly available to other countries. This will be a major contribution of the Norwegian project and is in line with Statistics Norway's policy of openness and transparency. The code will be made available around the summer of 2026.

2023-2025: Better and closer cooperation between stakeholders

During the project period, Norway has achieved much closer collaboration and mutual understanding between the Norwegian Directorate of Health and Statistics Norway, with in addition improved collaboration with other major stakeholders in HWF planning. A Policy Dialogue facilitated by WHO including input from the Joint Action coordinator was of particular importance in this regard. The Directorate of Health brought together key stakeholders from the Ministry of Health and Care, the Ministry of Education and Research, the Regional Health Trusts (hospital sector), the Norwegian Association of Local and Regional Authorities (primary care), and Statistics Norway.

2025-2026: Input to the new HWF Plan 2040

One of the key outcomes of HEROES is that we have been able to provide much more insightful and better-quality input to the government's new HWF Plan 2040[21], which is currently being developed. The Directorate of Health has collaborated closely with Statistics Norway, and a working group including representatives from the Regional Health Trusts and the Norwegian Association of Local and Regional Authorities, in order to provide updated information to the Ministry of Health and Care. This input would not have been possible to achieve at the same level of quality without all the previous collaboration through HEROES. Ultimately, this paves the way for more HWF cooperation and better HWF policies in Norway and is therefore an important achievement.

HEROES: Lessons learned

Over the past three years, Norway has achieved greater mutual understanding among key actors of the challenges that lie ahead for sustainable HWF planning. As a small country Norway had an overview of the different actors already, but it proved very useful to bring everybody around the same table for open discussions about the road ahead. It has become clearer how the different levels of the health system increasingly depend on each other also in terms of the HWF. Since Norway already had an established HWF forecasting model, it has not been natural for us to follow the three phases of adoption, implementation, and upscaling.

One take away from the Policy Dialogue was that successful HWF planning not only depends on the data and tools, but also on good governance and stewardship of the entire healthcare system. The discussions on governance highlighted a range of views on the current planning system. Participants emphasized that roles and responsibilities were generally well understood in the Norwegian system and that, in general, there was a high level of trust between institutions. However, high levels of autonomy and independence probably lead to some of the issues identified regarding misaligned plans and HWF forecasting models (with national, regional and municipal levels using different models and projections). This was particularly noted for the highly fragmented municipal level, as well as between the two levels of health care service delivery. Participants pointed to a need for working to align better national, regional, and municipal plans and objectives. This was important for several reasons: (1) To ensure that municipalities are able to participate in planning and have their priorities reflected, (2) To focus on using existing fora or a more active engagement of the county governance level, and (3) To increase stakeholder engagement and communication between the parties.

20 GitHub is a web-based platform that hosts Git repositories and provides tools for version control, collaboration, and project management for software development teams.

21 Regjeringen, 2025: Prop. 1 S (2025–2026) - regjeringen.no

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

Domain 1: Political and contextual support

The Norwegian health & care services are publicly funded, with a relatively small private health sector in addition to the public services. There is a strong and broad political commitment to ensuring that people receive equally high-quality health & care services regardless of where they live. As the population pattern in Norway is decentralized, it follows that the health & care services are also distributed across the country, with some centres catering to a very small population.

The state is responsible for specialist health & care services, and governs four regional health trusts, which in turn own the hospitals that provide specialist health care. Extensive primary care services, on the other hand, are the responsibility of all 357 municipalities in Norway. Norway e.g. spends a relatively higher percentage of its budget on long term care, which is delivered by the municipalities. Public dental care services are the responsibility of 15 counties. This decentralized model, with responsibility distributed across different actors, leads to coordination challenges for patients and health care workers alike. A relatively new entity is the 19 “health communities” (helsefellesskap)[22] set up as coordinating bodies with participation from both the hospital trusts and the municipalities in their area. These bodies are meant to serve as a coordination forum between the specialist and primary health care providers and are meant to provide a forum where common planning (including HWF planning) can take place. Their full potential is yet to be realized.

On the employment side, the municipalities and regional health trusts have a large degree of freedom as to how they organize the health & care services and how many and which type of employees they want to employ, as long as they comply with the Norwegian health care laws. There are very few areas in the health and care sector that are governed by hard rules or laws about a specific number of e.g. nurses per patient. This is in contrast with many other countries, where staffing levels are more strictly defined. However, in Norway there are some laws that state that the municipalities must have a specific type of competence (e.g. psychologists) "available", without specifying the number of personnel required. In general, the health care trusts and municipalities must deliver health & care services that comply with a quality criterion set out in the law (which directly translates as a "soundness requirement").[23]

In Norway there has been a strong increase in the number of health and care workers in recent years, such that the proportion of all employees in Norway working in the health & care services had reached over 15 per cent in 2021.[24] However, a continued increase of this proportion, coupled with future demographic developments, is not deemed sustainable. This was the conclusion of an independent Health Personnel Commission established by the Ministry of Health and Care, and the Ministry has in a later white paper supported this conclusion. The standards and quality of the health & care services have increased at the same time, and a future challenge will be to sustain the high quality of care at the same time as there are clearer limits to growth. Better use of health personnel is vital going forward, and this necessitates careful planning.

The Joint Action was initiated at a particularly suitable moment for the Norwegian health system and has contributed to strengthening national planning capabilities. There is strong political and administrative focus on the HWF situation in Norway, including challenges related to recruitment, retention, and long-term sustainability of health personnel. In this context, the Joint Action aligned well with national priorities, as the Ministry of Health and Care Services was developing a comprehensive HWF plan. HWF planning is recognized as a crucial factor for ensuring resilient and sustainable health services, and the results of the Joint Action have provided valuable support and evidence that complemented this work.

22 Helsefellesskap - Helsedirektoratet
23 helse- og omsorgstjenesteloven – Store norske leksikon
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Domain 2: Human Resources for Health (HRH) governance

The Norwegian HWF planning process is relatively decentralized. The central ministries (Ministry of Health and Care Services, Ministry of Education and Research, and Ministry of Finance) are important in that they are both setting entry quotas for certain groups like e.g. medical students and deciding on the university and higher education budgets. All three ministries have a vested interest in the planning and projection process for future labour market needs. Since 2017, the Ministry of Health and Care Services, the Ministry of Education and Research, and two other ministries have furthermore become more involved in the process of deciding the curriculum for health and care service students, through a common central process. Universities and other higher education bodies are required to educate a specified number of health and care students each year.

The Norwegian Directorate of Health plays a key role by providing annual, independent recommendations on future needs for different categories of students and thus future HWF supply to the Ministry of Health and Care Services. The Ministry uses this input in its dialogue with the other ministries regarding the determination of minimum student quotas. Within the Directorate, the national HWF forecasting model developed by Statistics Norway is a central tool for this work, supplemented by information on student numbers, current staffing levels, planned developments in health & care services, and so forth.

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	Name of the stakeholder	Involvement in the HWF planning process	Data		Process		Skills	
			I	P	I	P	I	P
A	Ministry of Health and Care Services	Already involved	H	H	H	H	H	H
B	Norwegian Directorate of Health	Already involved	H	H	H	H	H	H
C	Regional Health Trusts and Health Trusts	Already involved	H	H	H	H	H	H
D	Norwegian Institute of Public Health	Not yet involved	H	L	L	L	L	L
E	Statistics Norway	Already involved	H	H	H	H	H	H
F	Ministry of Finance	Already involved	H	H	H	H	H	L
G	Ministry of Education and Research	Already involved	H	H	H	H	H	H
H	Norwegian Directorate for Higher Education and Skills	Already involved	H	H	H	H	H	L
I	Norwegian Directorate for Education and Training	Already involved	H	H	H	H	H	L
J	Ministry of Local Government and Regional Development	Already involved	H	H	H	H	H	H
K	County Governor	Already involved	H	L	H	L	H	L
L	356 Norwegian municipalities	Not yet involved	H	H	H	H	H	H
M	The County Municipalities	Already involved	H	H	H	H	H	H
N	Norwegian Association of Local and Regional Authorities	Not yet involved	H	H	H	H	H	L
O	Norwegian Labour and Welfare Administration	Not yet involved	H	H	H	L	H	L
P	UHR Universities Norway	Not yet involved	H	L	H	L	H	L
Q	Various Professional Orders and Trade Unions	Already involved	H	L	H	L	H	L
R	Patients' Associations	Not yet involved	L	L	L	L	H	L
S	Private Providers' Associations	Not yet involved	H	L	H	L	H	L

Description of main stakeholders

As for the roles and responsibilities in HRH (Human Resources for Health), the Section for Competence, Research and Innovation in the Ministry of Health and Care Services is responsible for the ministry's HRH functions, in addition to several other roles. Other units within the ministry also carry out specific HRH-related tasks. At the Directorate of Health, the Department of Competence Development holds the main responsibility for HRH functions, while other departments within the directorate perform selected HRH-related activities as well.

The HR units of the four Regional Health Trusts also have regional responsibility for HRH planning and related functions for the hospitals in their area. Similarly, each municipality in Norway is responsible for local HRH planning. Some municipalities often the larger ones possess analytical capacity and use forecasting tools, whereas many smaller municipalities do not.

HRH policy and strategy form a central component of the Ministry of Health and Care Services' three-year national health and cooperation plan (white paper). The Competence Enhancement Plan 2025 further outlines priorities for developing competence in primary health care services.

There is no permanent national mechanism dedicated solely to HRH planning. However, the Ministry of Health and Care Services collaborates closely with the Directorate of Health, the Ministry of Education, the Regional Health Trusts, the Norwegian Association of Local and Regional Authorities (KS), and other stakeholders to ensure coordinated planning and strategy development.

As for the analysis of data, Statistics Norway combines HWF data with population statistics (including forecasts) and health service activity data to project the future supply and demand of the HWF. These projections are used widely for planning purposes.

Both the Ministry of Health and Care Services and the Directorate of Health use the forecasts in various HWF planning processes. For example, the Ministry of Health and Care Services relies on them when developing new policies, such as white papers.

When planning educational capacity, the Directorate of Health uses HWF data and forecasts to prepare a recommendation report for the Ministry of Health and Care Services regarding annual student quotas in health-related study programmes. The Ministry uses this report, alongside other inputs, to form its own recommendations. It then engages in discussions with the Ministry of Education on budgets and the allocation of student quotas. The final budget, including the approved quotas, is ultimately decided by Parliament.

Domain 3: HWF planners' capabilities

At the national level, the overall HWF planning skill set is considered sufficient. The main challenge is not technical competence but limited cross sector communication and a lack of shared understanding between actors in the health and education sectors. Instead of introducing new training, improved collaboration, clearer information flows and better alignment of methods appear more effective.

Strengthening partnership and communication is essential for achieving coherent national HWF planning.

At the regional level, the Regional Health Authorities (RHAs) have analytical teams with strong competencies in data analysis, modelling and forecasting, including the use of advanced HWF forecasting models. However, the complexity of this model means it's not always fully utilised. Effective workforce planning also requires skills such as coordination across management, finance, clinical leadership and HR, which can be difficult to sustain. While the Directorate of Health cannot directly build capacity within the RHAs, it has strengthened communication channels and facilitated more systematic exchange of insights.

County municipalities also play an important regional role as they are responsible for upper secondary education and dental services, both central to long term HWF planning. Collaboration mechanisms between national actors, counties and the health sector remain underdeveloped, and as at national level the main improvement area is structured partnership building and more consistent communication.

At the local level, Norway's 357 municipalities bear responsibility for primary care and have the greatest need for enhanced skills. Many municipalities are small, with limited analytical capacity, little time for long term HWF planning and few resources for working with data or forecasting tools.

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At this level, there is a good foundation in data literacy, the use of planning tools and basic HWF forecasting models, as well as skills such as strategic thinking, system understanding, and leadership. At the same time, these competencies can be further strengthened and developed to meet increasing demands and more complex tasks.

Several initiatives, such as the government's Competence Enhancement programme 2025 and The Norwegian Association of Local and Regional Authorities (KS)' activities, aim to strengthen municipal planning capacity. Through HEROES, Norway have reviewed existing measures and gained insight into current practices, but a comprehensive overview of needs is still missing. Further work is required to map gaps in health policy knowledge, data and modelling skills, planning methods and systems thinking. Based on our assessment, municipalities are the stakeholder group in Norway with the greatest need for expanded skills in data analysis, modelling and forecasting tools and the soft skills required for comprehensive HWF planning.

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

Through the HEROES initiative, Norway has to some degree contributed to strengthening local capacity for strategic HWF and competence planning. A key example is our involvement in a training course for municipalities in Telemark, Rogaland and Møre og Romsdal, developed and delivered by the County Governor and KS. Our role has been to provide subject matter input and perspectives relevant to long-term HWF planning. The courses are intended as an introduction and should be viewed as a starting point for municipalities beginning the development of strategic competence plans. Since these planning processes are extensive and complex, especially for smaller municipalities, a basic course offering initial insight is highly valuable.

The Telemark course has helped municipalities understand how they can approach strategic competence planning[25] more systematically. This includes analysing future service and workforce needs, assessing labour market dynamics, and linking competence strategies with broader local planning processes. While the early results are encouraging, this work is ongoing. Further collaboration and continued refinement of the course materials are necessary to provide municipalities with practical and adaptable tools for long term competence planning. We have not yet reached the final outcome, and supporting municipalities more fully will require additional development of guidance and methods.

Building on experiences from Telemark and other existing initiatives, we are now contributing to the development of more generalised material that can be used by municipalities across Norway. The aim is to create content that is flexible enough to support municipalities with very different sizes, structures and capacities. A key priority is helping local authorities shift from short-term, reactive staffing measures to a more proactive, strategic approach that ensures they build the necessary competence to meet future service needs.

At the national level, HEROES has also facilitated improved coordination among key stakeholders. We have provided the Ministry of Health and Care Services (HOD) and the Ministry of Education and Research (KD) with in depth presentations on Helsemod, particularly in relation to its use in the work with the new national HWF plan. Although these sessions were not formal training, they improved shared understanding of modelling assumptions, data sources and methodological choices.

In conclusion, **HEROES has in Norway contributed to improving strategic competence planning at the municipal level and strengthening cooperation among national stakeholders. These efforts support better communication, shared understanding and more coherent approaches to HWF planning, laying a stronger foundation for long term preparedness and the ability to anticipate future HWF needs.**

25 It's a systematic and long-term approach to identifying, developing, and utilizing the skills and competencies a municipality needs to achieve its goals. The purpose is to secure sustainable service delivery, support renewal and development, and ensure that employees can adapt to new tasks and evolving expectations in the sector

Domain 4: HWF data and models

HWF Data: Sources

Norway has a well-developed HRH information system, and data quality is generally regarded as high. Statistics Norway is the main actor and compiles HWF statistics by combining data from several national registries. The core source is the digital reporting system used by all employers to report employment and income information to the Norwegian Tax Administration. Statistics Norway processes these data to produce comprehensive statistics on employment and wages.

To enrich the HWF data, Statistics Norway also integrates information from the Health Directorate's health personnel register and from the National Education Database managed by the Directorate for Higher Education and Skills. Estimated labour shortages are incorporated through surveys conducted by the Norwegian Labour and Welfare Administration.

On the demand side, Statistics Norway provides population data and long-term demographic projections covering the next 80 years. Data on patients and service users are supplied through the Norwegian Patient Register and the Municipal Patient and User Register, transferred to Statistics Norway via the Norwegian Institute of Public Health. These datasets include key variables such as age, gender, type of treatment and geographic area.

Advanced Minimum Data Set: achievements under HEROES

No changes have been made to the AMDS, and overall Norway has access to the data necessary for effective HWF planning. Statistics Norway's model includes annual productivity growth, service standard growth, health improvements, and informal care, all of which are partly or fully based on qualitative data and assumptions.

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
Specialisation	X	X	X	X	X		
Country of first qual-ification	X	X	X	X	X		
Gender	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	X
	Labour market
Financial investment, economical background	X
Performance and productivity	X

Legend:

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

HWF Data: improvements

Norway entered the Joint Action with a broad and high-quality dataset. Because of this, the focus has not been on gathering additional data. Instead, we have concentrated on developing processes that ensure more comprehensive, accurate, and quality controlled data for the HWF forecasting model. Statistics Norway has initiated work to provide more comprehensive and accurate data for the projection models of both supply and demand. Throughout the HEROES period, Statistics Norway have improved the entire data pipeline, including the processes for collecting, validating, cleaning, and structuring the necessary datasets. As part of this effort, the existing codebase has been migrated and redesigned, changing the programming tool from SAS Enterprise to R to ensure greater transparency, flexibility, and reproducibility.

By the end of the HEROES period, Statistics Norway will deliver a fully documented and shareable code repository detailing all transformations from source data to model input, including integrated quality checks. In addition, a concise protocol will be prepared to document the steps taken, supporting future maintenance, reproducibility, and continued development of the forecasting models.

Statistics Norway has also undertaken an important task related to enhancing transparency and accessibility of the forecasting model's foundations. Statistics Norway is currently exploring the possibilities for regularly publishing the model's underlying data and methodological basis on its website, thereby making them available to stakeholders and the general public. While it remains uncertain whether this publication can be fully implemented within the HEROES period, it is nevertheless an ambition to move forward swiftly. Establishing a regular dissemination practice is expected to strengthen understanding and trust in the statistical outputs, while also reducing internal resource use by streamlining requests and clarifications.

Statistics Norway have also conducted a study on health care service usage in Norway by immigrant background to assess whether such factors should be incorporated into the forecasting model. The results indicate that it is largely unnecessary to include immigrant background as a parameter in the model. Overall, differences in health & care service utilization between the majority population and immigrants are small, particularly among older age groups, the population segment where the need for health and care personnel is greatest. This suggests that immigrant background has limited impact on the model's outcomes and would not substantially improve its predictive value. The study will be published as a scientific article during the Joint Action period.

HWF Data: HEROES contributions and future directions

Looking ahead to the period after HEROES, several important areas for further development have been identified. One priority is to explore data from private-sector health & care service providers, as these sources are currently not fully captured in the existing datasets. Another key task will be to investigate informal care[26] in more detail, since its scope and influence can significantly affect both the demand for formal services and the availability of health and care personnel. Gaining better insight into these aspects will help strengthen and refine future projections.

Equally important is the continuation of the strong collaboration established during HEROES, particularly with Statistics Norway and the other stakeholders involved in the project. This cooperation has been essential for developing a shared understanding of the data, its limitations, and how it can be improved. The partnerships built through HEROES have created a solid foundation for ongoing improvements and will continue to play a vital role in shaping the future of HWF forecasting in Norway.

26 Unpaid care and support provided by family members, friends, neighbours or community members to people with health or care needs, usually outside formal employment contracts and regulatory frameworks.

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

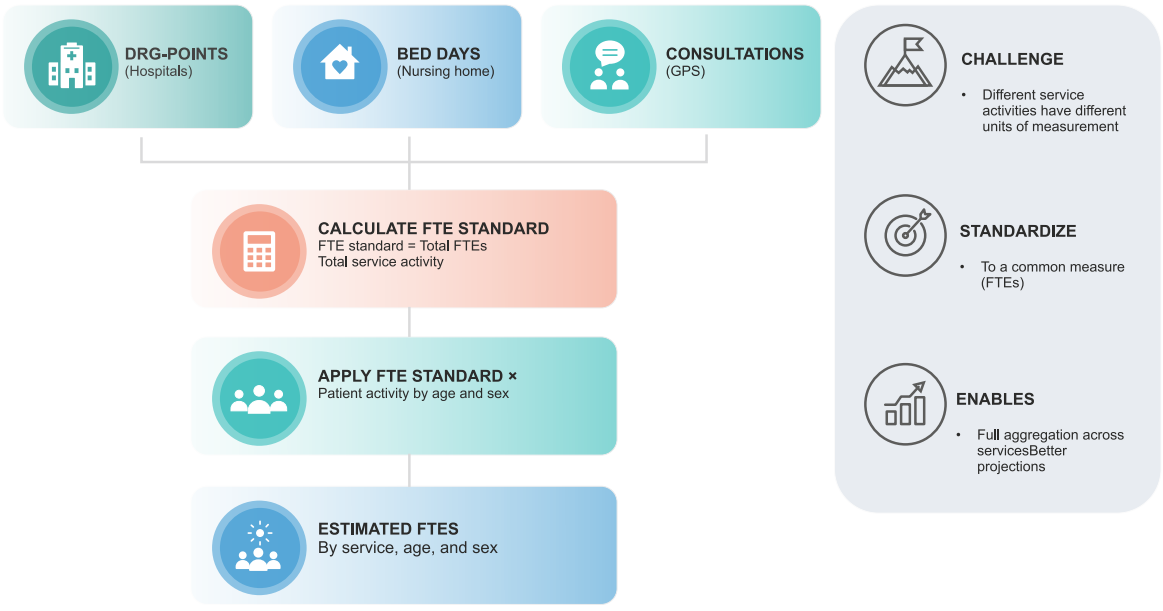
In Norway, several tools and models are used for HWF planning. Statistics Norway operates the main national HWF forecasting model (Helsemod), which was developed in the 1990s and has been continuously refined and updated up to the present day. While HEROES has primarily worked with Statistics Norway's Helsemod model throughout the project, we also provide some information on a few other relevant models to give additional context, including the model used by the regional health authorities.

Helsemod covers 14 key health professions such as doctors, nurses, midwives, dentists and physiotherapists. Together the groups represent a substantial share of the national health and care workforce. The model concentrates exclusively on tax-financed health and care services, representing about 85% of total health expenditures in Norway. Helsemod is a stock-and-flow forecasting model and estimates the number of health workers needed by combining population projections by age and gender, age-specific service use (unique user frequency) and the number of person years (FTEs) required per user (service standard). This provides a structured calculation of future HWF needs across major health service areas.

The model draws on several national registries. Key inputs include patient and user data from the Norwegian Patient Register and the Municipal Patient and User Register, population statistics and demographic projections from Statistics Norway, and employment statistics capturing current person years used in relevant services. Together, these data sources ensure broad and reliable coverage of both health & care service use and workforce supply.

To understand what drives changes in HWF demand, the model decomposes developments into demographic change, user frequencies and service standards. Health status is incorporated through scenarios that assume either constant or improved health over time. Improved health is modelled by reducing age specific user frequencies for those over 55, reflecting lower mortality and reduced need for some services such as somatic treatment[27], homebased care and institutional care.

FROM SERVICE ACTIVITY TO FTES:
BUILDING A COMMON MEASURE



27 Somatic treatment refers to medical treatment that focuses on physical (bodily) health conditions, including diagnosis and management of illnesses, injuries, and other biological disorders

Productivity growth which refers to the assumed annual improvement in how efficiently health & care services can be delivered, meaning that the same number of services can be provided using fewer resources, or more treatment can be provided with the same resources, is also included. Changes in person years per user reflect both potential efficiency gains and adjustments in service standards. This allows the model to account for alternative laboursaving developments and different assumptions about service quality.

Informal care is another component. The model includes scenarios where informal care either grows in line with demand or remains at 2019 levels. Although other assumptions are possible, uncertainty about the volume of informal care remains a weakness in the model.

By combining these elements, Helsemod provides forecasts of both supply and demand of HWF, helping assess expected gaps driven by demographic trends, service standards and user behaviour.

The Regional Health Authorities (RHAs) use a separate model for specialist health services. It is based on four components, projected workforce supply, demand derived from activity data, the gap-analyses, and scenario based modifying factors. The model uses HWF data, the Medical Employment Registry, Norwegian Patient Register activity data and population projections from Statistics Norway. Demand is calculated by linking activity drivers primarily doctors and selected psychology specialists to activity codes, while staffing needs for other groups, such as nurses, are estimated using ratios tied to these activity drivers within each specialty. Future HWF needs can then be projected linearly based on current staffing levels and expected changes in activity across health and disease categories.

Other HWF forecasting models are simpler and are designed primarily for use by the municipalities. These models provide information on the expected demand for health and care services, but they do not include projections of the future supply of health personnel. The responsibility for these tools lies with the Ministry of Local Government and Regional Development (KDD) and the Norwegian Association of Local and Regional Authorities (KS).

Statistics Norway has made significant improvements to their Helsemod forecasting model during the Joint Action, as outlined in the introduction. This includes the full migration from SAS Enterprise to R and a redesign of the model structure to ensure a more robust, transparent, and efficient framework for analysing supply, demand, and workforce gaps.

In addition, Statistics Norway has developed a prototype of an interactive dashboard, enabling more accessible and dynamic presentation of projection results. Scripts and procedures have been created to link supply and demand outputs and automate the generation of tables, figures, and visualization-ready datasets, contributing to a more streamlined workflow and broader use of the model.

HWF Planning Models: HEROES contribution and future directions

In the period following HEROES, Norway aims to continue developing the model by for example adding new scenarios, regional modelling, refined staffing norms or updated production ratios.

An important development is enabling Statistics Norway to produce supply-and-demand forecasting at a regional level. This will be an important next step toward strengthening the model's relevance for planning across different parts of the country, where demographic patterns and HWF needs can vary significantly. Expanding the model in this direction will require continued analytical and technical development, but it offers substantial added value for both national and regional decision makers.

The increased accessibility of results through more open documentation, published datasets, and potentially interactive visualizations will hopefully encourage wider use of Helsemod, and a deeper understanding of how the forecasts are produced. Greater transparency may also support more informed discussions and help stakeholders interpret and apply the results more effectively. In addition, this enhanced transparency will support policy development because it makes the underlying assumptions, data sources, and model logic more accessible and easier to understand, which in turn allows decisionmakers to base their assessments on clearer and more interpretable evidence. A related ambition is that Statistics Norway will be able to update the model outputs more frequently, ensuring that projections better reflect current conditions and newly available data.

As with other parts of the work, the strong collaboration developed during HEROES, between the Directorate of Health and particularly Statistics Norway, remains essential. This cooperation has been a key factor in achieving the improvements made so far, and continuing this partnership will be crucial for further strengthening and refining the model. With sustained collaboration, expanded data availability, and ongoing methodological improvements, Helsemod can become even more robust, useful, and widely applied in the years to come.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

In order to build on the success of the project, Norway has proposed sustainability actions in all four domains of the sustainability framework developed by our WHO partners. Norway also recognizes that another EU action would be important for the continuation of this work.

Political support, contextual and environmental factors will be essential for sustaining the progress from HEROES. We therefore aim to build on and continue the improved contact between national stakeholders that has been developed during the project, including between the Ministry of Health and Care and the Ministry of Education and Research.

Regarding HRH Governance we furthermore want to continue the dialogue between the different HWF forecasting bodies on national, regional and municipal levels. Better comprehension of future HWF needs amongst stakeholders working at the different levels will lead to more coordinated planning. These processes have been helped by the initial Policy Dialogue.

The Norwegian Directorate of Health wants to continue to contribute to HRH Planners Capabilities building for municipalities aiming to improve their strategic workforce planning, in close collaboration with relevant actors.

We also want to build on the improved contact between the Norwegian Directorate of Health and Statistics Norway on HWF planning that has been developed, as well as keep in contact with European colleagues. Mutual comprehension between developers and users of the national level planning model will lead to better results. Adoption of good ideas from other countries, and improved comprehension of the European study and labour market with which Norway is closely integrated, is important.

Statistics Norway will continue to use the more comprehensive, accurate and quality controlled data for the projection model (Helsemod), possibly with regular publication of the data. They will also continue to use the improved projection model of the labour supply of health workers in Norway. Newly developed tools that make projection results of Helsemod more easily accessible should greatly increase the usefulness of the model for local planners.

The end result we aim for is greater mutual understanding and dialogue between the different actors, leading to better and more coordinated HWF planning on the different, supported by relevant policies.

COUNTRY REPORT PORTUGAL

6.5 COUNTRY REPORT: PORTUGAL

Introduction

National HWF Planning System before HEROES

Before HEROES HWF planning in Portugal was centrally coordinated but only partially integrated and weakly institutionalized. Led mainly by the Central Administration of the Health System (ACSS) and supported by Regional Health Administrations (ARS), whose abolition in early 2024 introduced new uncertainty, the system suffered from fragmented data, rough coordination, and limited strategic capacity.

Planning remained largely supply driven and physician-centric, relying primarily on medical education and residency quotas as top-down policy instruments. While this approach ensured predictable training inflows and short-term stability, it inadequately addressed wider human HWF challenges, including the roles of other professional groups, workforce retention, geographic imbalances and the shift toward new models of care. In the context of population ageing, increasing multimorbidity and rising workforce mobility, these limitations have become more pronounced, strengthening the case for a broader planning paradigm that complements training controls with integrated data on working conditions, career pathways and system performance to support more comprehensive and sustainable HWF strategies.

Medical Training Quotas as the Core of HWF Planning

- Quotas constitute the main mechanism through which Portugal steers the future supply of physicians and serve as a central pillar of workforce planning policy.
- By controlling access to specialty training, the system aims to align the number and profile of new specialists with projected needs, considering demographic trends, retirement patterns, and system capacity.
- Training quotas are defined through a structured but largely top down process, led technically by the Medical Council and reviewed by the National Commission for Medical Internship (CNIM), with final approval by the Ministry of Health.
- The governance model reflects a planning paradigm that is primarily supply driven and strongly focused on physicians, with limited integration of other health professional groups in workforce planning.

From 2013 to 2015, Portugal participated in the first Joint Action on Health Workforce Planning and Forecasting (JAHWFPF). The main developments and achievements were: (1) the projection model adopted in the Portuguese Pilot Project enabled to identify imbalances in the number of professionals based on the health needs of the population in the medium and long term (until 2030) allowing the assessment of the HWF situation and identify current and future imbalances, (2) publication of Law No. 104/2015, of 24th August that creates the National Inventory of Health

Professionals (INPS) and sets out its operating framework, including HWF data from the public, social and private sectors, and (3) creation of the HWF Planning and Monitoring Unit (ACSS).

HWF planning relies primarily on descriptive workforce statistics, administrative data and service delivery indicators produced regularly by ACSS (e.g. financial performance and health care delivery). Professional councils and higher education institutions contribute through training regulation and capacity definition. However, overall, planning processes remain largely sector-based, with limited alignment between education, labor market dynamics, and long-term health system needs.

ACSS is responsible for planning and submitting proposals to the government. However, it is the government that approves and decides, as it sets priorities and guarantees and allocates resources. ACSS plays a key operational and technical role, including HWF data collection, recruitment, management, and regulation of human resources in the health sector as well as support planning exercises linked to national strategies and budgetary frameworks.

Despite these advances, HWF planning prior to HEROES remained fragmented and only partially institutionalized. While decision-making was informed by available administrative and statistical data, it lacked an integrated and systematic forecasting framework capable of translating evidence into consistent policy action. Planning mechanisms were predominantly centralized, with limited capacity to anticipate long-term needs, insufficient modelling of HWF dynamics, and weak consideration of regional specificities and service-level realities. Furthermore, the connection between analytical findings and policy execution was not always clear, leading to a limited integration of evidence into strategic decision-making.

Taken together, these limitations define a baseline characterized by partial maturity: a system with established data sources and formal planning instruments. While core data sources and formal planning instruments are in place, the governance and coordination arrangements remain insufficiently developed to address the complexity and scale of HWF planning.

HEROES: Key Achievements

Throughout HEROES, Portugal successfully achieved key developments in strengthening HWF planning.

Key achievements in Portugal

Human Resources in Health Plan 2030 (PRHS 2030) represents a key milestone by positioning **strategic HWF planning as a central policy priority.**

Promotion of structured policy dialogue that facilitates inter institutional coordination and the use of technical evidence in decision making.

Strengthening national planning capacities, contributing to a more forward looking, integrated and sustainable approach to the HWF.

Improvement of the evidence base for decision making, with increased recognition of BI RH SNS as a strategic planning tool.

Positioning Portugal as an example of an intermediate maturity system, demonstrating the value of EU level support in accelerating structural reforms.

2023: Reinforced coordination on HWF planning

In 2023, HEROES strengthened coordination among national stakeholders, consolidating HWF planning as a strategic policy function through formal cooperation mechanisms, notably Joint Order No. 7985/2023[28], subsequently reinforced in 2025.

These mechanisms brought together key institutions, including the Central Administration of the Health System (ACSS), the General Directorate of Health (DGS), the Executive Directorate of the NHS (DE SNS), the Shared Services of the Ministry of Health (SPMS), and the Centre for Planning and Evaluation of Public Policies (PlanAPP).

They also supported the expansion of evidence based analysis of the NHS workforce, covering workforce profiling, overtime work, gender distribution and leadership profiles, absenteeism among health professionals, as well as determinants of job satisfaction and retention, the latter being addressed within the HEROES Community of Practice.

2024: Ministry of Health - Human Resources in Health Plan 2030

The publication of the Human Resources in Health Plan 2030 (PRHS 2030) marked a major milestone in Portugal's approach to HWF governance, explicitly establishing strategic HWF planning as a central policy priority. Its first strategic axis "Improving strategic human resources planning", underscores that sustainable health system performance depends on a robust understanding of workforce availability, distribution, skills and dynamics, and places strong emphasis on improving more granular data on workforce and more comprehensive and integrated data.

Building on this stronger evidence base, PRHS 2030 aims to move beyond reactive and short term adjustments by strengthening strategic planning, analytical and forecasting capacity across the health sector. By framing HWF planning as a continuous strategic function, the plan provides a solid policy foundation for subsequent initiatives, including those developed under HEROES, and supports the long term objective of embedding evidence based, coordinated and forward looking workforce planning within health system governance.

2024: Shift towards retention and sustainability

In recent years, HWF policy in Portugal has shifted towards a more holistic understanding of sustainability, recognizing that training and recruitment alone are insufficient to ensure workforce stability. Growing challenges such as burnout, high workloads, limited career progression, and uneven working conditions have led to increased emphasis on professional satisfaction, retention, and working conditions as core elements of HWF planning.

Reflecting this shift, the Health Program of the XXV Constitutional Government foresees the creation of a Professional Motivation Plan[29] supported by evidence from the National Study on Professional Satisfaction and Retention Factors in the NHS[30]. This study was led by the Institute of Hygiene and Tropical Medicine, Nova University Lisbon (IHMT/NOVA) with analytical support from PlanAPP.

2025: Improved use of evidence in planning discussions

As part of HEROES, policy dialogue sessions were developed in Portugal, bringing together a multidisciplinary team of key stakeholders involved in HWF governance and planning. These sessions facilitated mutual understanding of roles, constraints, and priorities, helping to bridge traditional silos between institutions. They also supported the co-creation of solutions by aligning evidence, policy objectives, and practical feasibility.

28 https://files.diariodarepublica.pt/2s/2023/08/150000000/0002900031.pdf
29 https://www.sns.gov.pt/institucional/politica-de-saude/programa-do-xxv-governo-constitucional-para-a-saude/
30 https://www.planapp.gov.pt/wp-content/uploads/2025/06/PLANAPP-SatisfacaoSaude.pdf

In this sense, cooperation mechanisms did not merely serve as consultation platforms, but as enablers of more integrated governance, fostering trust, transparency, and collective ownership of HWF planning processes. This diversity enriched the discussions by combining strategic, technical, and operational viewpoints that are rarely addressed simultaneously within routine decision-making processes.

2025: Consolidation of European collaboration

Portugal has strengthened its engagement in EU level cooperation on HWF planning as HEROES established a solid platform for cooperation across countries. This engagement has promoted a more integrated, evidence based approach to HWF planning, enhanced national analytical capacity and policy learning, and supported alignment of domestic planning efforts with emerging European standards for health system performance, sustainability and resilience. In parallel, Portugal takes active part in other European platforms regarding HWF planning, namely the Health Systems Performance Assessment Expert Group (HSPA EG), which makes it possible to consolidate shared methodologies and strengthen synergies between partners.

2025: Training courses

The development of the "International Course on Governance and Strategic Planning of the HWF" was a key contribution of Portugal within the HEROES project, addressing critical gaps in technical, analytical and leadership capacities for HWF planning. By strengthening skills in data analysis, forecasting, management and systems thinking among central and local stakeholders, the course supported a more evidence-based, coordinated and sustainable approach to workforce planning. Its focus on retention, motivation, and governance ensures lasting relevance beyond HEROES, contributing to long-term preparedness and resilience of the health system. The course also reinforced the need to create professional networks between different institutions for HWF planning.

HEROES: Lessons learned

Portugal's participation in HEROES demonstrated that HWF planning is only effective when embedded within governance processes. From the outset, it became evident that data and methodologies alone cannot generate impact without political commitment, stakeholder engagement and integration into regular decision making cycles. Policy Dialogues played a decisive role by bringing together institutions from the health, education and statistics sectors, as well as professional bodies, creating a structured space to build a shared understanding of systemic challenges, territorial imbalances and emerging needs.

The Portuguese experience within HEROES highlights several relevant lessons learned.

Relevant lessons learned

Structured and continuous policy dialogue is essential to align diverse institutional actors and ensure that technical analyses effectively inform strategic policy decisions.

Institutional reforms require technical continuity, particularly in governance and planning functions, to prevent the loss of accumulated expertise and analytical capacity.

Capacity building must accompany data development, as investments in information systems only generate value when matched with sufficient analytical skills and institutional mechanisms for the use of evidence.

Information systems deliver impact when embedded in policy processes, moving beyond descriptive or administrative functions towards active support for decision making.

Main conclusions of policy dialogue sessions stressed a need to: (1) improve and integrate information and data systems, (2) develop and implement planning models based on health needs (3) strengthen the technical and strategic capacity of planning teams, (4) carry out HWF planning based on a macro-level analysis, while maintaining flexibility for adaptation at regional and local levels and (5) ensure interministerial involvement.

This **collaborative process reinforced the importance of developing a continuous, institutionalized planning model capable of anticipating workforce needs and strengthening coherence between central, regional, and local levels.** To achieve this, Portugal outlined several key actions: (1) the creation of intra and interministerial coordination structures, (2) the establishment of dedicated planning teams, (3) the implementation of ongoing training in strategic HWF planning, including data analysis, forecasting, scenario modelling, and policy translation; and (4) the reinforcement of interoperable data systems alongside the development and regular use of prospective workforce models.

Within the scope of the policy dialogues, **priority was given to the creation of formal consultative structures**, both intraministerial (within the Ministry of Health) and interministerial, **to support decision-making regarding HWF strategic planning.** The lessons learned through HEROES are particularly relevant in the current phase, as **Portugal moves towards institutionalizing HWF planning as a permanent and structured function of health system governance.**

Despite these advances in HEROES, several risks persist, including the uncertainty generated by ongoing reforms in the NHS and public administration, shortages of specialized personnel, and potential resistance to structural changes. Mitigating these risks will depend on transparent communication, continuous stakeholder engagement, and consistent use of evidence. Overall, HEROES is expected to leave a legacy: the consolidation of a forward-looking, coordinated and evidence-based planning process, is essential for building a more resilient, equitable and future-ready Portuguese NHS.

The following chapters mirror the Sustainability Framework established in D1.2 (Final Deliverable on HWF planning: data, models and skills), providing a robust basis for comparing diverse national health systems while preserving the integrity of country-specific contexts. All country analyses were conducted using this analytical framework, ensuring coherence across diverse health system models.

As mentioned before, the HEROES **Sustainability Framework** conceptualizes sustainable HWF planning through four interrelated dimensions: (1) political and contextual support; (2) HRH governance; (3) HWF planners' capabilities; and (4) HWF data and models. These dimensions form both the basis of comparative analysis and the structure of the country reports and are closely linked to the core functional tasks of data, models, skills, and governance/stakeholder engagement.

Portugal's approach to HWF planning is broadly aligned with the Framework, reflecting a centrally coordinated public governance model with clear institutional roles, strengthening analytical capacity and expanding data systems. Recent reforms supporting integrated care and evidence-based decision-making underscore a commitment to long-term strategic HWF planning, while recognizing remaining challenges and the need for continuous improvement.

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

Domain 1: Political and contextual support

Portugal has a predominantly public, national health system which provides universal coverage and is financed mainly through general taxation. NHS coexists with a private and social sector that plays a complementary role, namely in the fields of diagnostics, outpatient care, and long-term care. Health policy and HWF governance are largely centralized at national level, under the responsibility of the Ministry of Health, while healthcare delivery is organized through hospitals, primary care units and, more recently, integrated Local Health Units (ULS). **This mixed but publicly led system shapes HWF planning by concentrating decision-making authority at central level, while requiring coordination with multiple providers, sectors and other central-level institutions within the Ministry of Health.**

Following the abolition of the ARS, there has been a clear need to clarify, redistribute and reorganize HWF planning processes and responsibilities within the Portuguese health system. The removal of this regional governance layer created uncertainty regarding who is responsible for needs assessment, HWF allocation, and the translation of national planning decisions into regional and local implementation. While some functions have been absorbed by central bodies and others by the newly created ULS, the precise roles, mandates and coordination mechanisms remain insufficiently defined. **This transitional context highlights the importance of establishing clearer governance arrangements, lines of accountability and planning interfaces to ensure continuity, coherence and effectiveness in HWF planning across national, regional and local levels.**

HWF planning in Portugal is embedded within broader health system governance, budgetary and public administration frameworks. The ACSS plays a central role in HWF data collection, recruitment authorizations, and planning support.

Strengthening HWF planning requires shifting from short term, budget driven decision making towards a more strategic, multiannual approach aligned with population health needs and workforce dynamics. Key improvements include better integration of long term planning instruments with budgetary processes, greater use of forecasting evidence in decision making, and enhanced coordination between fiscal and workforce planning cycles. Embedding these elements into routine governance would support more proactive management of structural imbalances and regional disparities and enable sustained investment in HWF development.

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Territorial and organizational factors in HWF planning

Recent structural reforms, namely the extension of integrated care through Local Health Units (ULS), have increased the importance of territorial and organizational considerations in HWF planning.

Although planning remains nationally coordinated, these developments underscore the need to better reflect regional diversity, population health needs and service integration. As a result, effective HWF planning increasingly requires closer alignment between national policy objectives and local implementation capacity, supported by stronger mechanisms for stakeholder engagement across all levels of the health system.

Domain 2: Human Resources for Health (HRH) governance

This domain shows that HEROES contributed to upscaling HWF planning in Portugal to the level of strategic health system governance, improving coordination and analytical coherence across institutions. However, sustaining these gains requires moving from project-based collaboration to formalized governance structures capable of managing complexity, decentralization, and cross-sectoral dependencies in the long term.

The governance analysis confirms that HWF planning in Portugal is no longer a purely technical or administrative activity by itself but starts to become a **strategic governance function** that cuts across health policy, public finance, education and public administration.

The Portuguese HWF governance landscape is characterized by a **high degree of institutional complexity**, involving multiple public and semi-public actors with distinct attributions.

Institutionalizing strategic governance

While HEROES improved coordination and mutual understanding, governance arrangements remain largely dependent on informal cooperation. There is a need to institutionalize interministerial coordination mechanisms, particularly between health, finance and education, to ensure that workforce planning decisions are consistently aligned with training capacity, fiscal constraints and population health needs.

Formalizing HWF planning as a strategic function within the health system, with clear mandates, accountability mechanisms and integration into national health planning and budgeting cycles is essential to an effective HWF governance.

Despite progress, significant governance risks remain, particularly in the context of ongoing system reforms and increasing decentralization. The redistribution of responsibilities across central bodies, public institutions, and healthcare units increases the risk of decision-making fragmentation if coordination mechanisms are not sufficiently robust. The strong influence of professional councils, namely in medical training and residency planning, adds further complexity and might limit the system's capacity to adjust workforce composition in response to emerging needs.

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Reinforcing governance arrangements for strategic HWF planning

To mitigate these risks, Portugal needs to **reinforce governance arrangements that ensure coherence between strategic planning, data, training regulation and healthcare delivery,** particularly in a more decentralized environment. This includes clarifying roles, strengthening accountability, and ensuring that analytical capacity effectively informs binding policy decisions.

Policy Dialogues under HEROES helped bring together actors with high power and interest across data, planning tools and competencies, fostering a more integrated understanding of workforce challenges and interdependencies.

At the core of this system is ACSS, which plays a central role in HWF planning by ensuring the availability of human resources required to meet population health needs, in close cooperation with the DE-SNS. Strategic oversight and policy direction are provided by the Ministry of Health, while cross-sectoral dimensions of HWF planning are strongly influenced by the Ministry of Finance through budgetary rules and staffing ceilings and the Ministry of Education, Science, and Innovation, which are responsible for regulating and aligning training capacity with system needs.

As the central public health authority, the DGS shapes HWF needs by setting clinical and quality standards, defining public health priorities, steering service organization models, and leading the National Health Plan.

Outside the Ministry of Health, professional councils particularly those representing physicians and nurses exert significant influence over HWF planning through their statutory responsibilities in defining professional standards, competencies and ethical rules. Their role is specifically relevant in shaping training pathways and professional practice. In the medical field, this influence is reinforced by CNIM, which coordinates specialized medical training and plays a decisive role in defining residency structures and capacities.

Complementing these roles, SPMS operates as a public institution providing shared services in information systems, digital health, procurement, logistics, financial management and human resources, supporting operational efficiency and data availability across NHS.

Statistics Portugal (INE) contributes with essential demographic and labour market data, although its role remains largely technical, with limited influence over planning decisions or competency frameworks.

More recently, PlanAPP has emerged as an important technical actor, contributing with analytical capacity, prospective analysis, and evidence-based methodologies to support more granular data on human resources and long-term planning. While its influence on skills development and implementation remains indirect, PlanAPP has strengthened the strategic coherence of HWF discussions by introducing structured analytical tools and scenario-based approaches.

The following table identifies the stakeholders by power/interest (using stakeholder matrix mapping), across the various areas of the project (data, planning tools, and competencies), highlighting the following: (1) the stakeholders with high power and interest in data, processes and tools and skills are the Ministry of Health, MECI, DE SNS, DGS and the Professional Public Associations; (2) PlanAPP and SPMS show high interest and power in data, processes and tools; and finally, (3) INE has high interest and power in the area of data.

Name of the stakeholder	Involvement in the HWF planning process	DATA		PROCESS AND TOOLS		SKILLS	
		I	P	I	P	I	P
Ministry of Health	Involved	H	H	H	H	H	H
Ministry of Education, Science and Innovation	Involved	H	H	H	H	H	H
Executive Board of the National Health Service (DE - SNS)	Involved	H	H	H	H	H	H
Competence Center for Planning, Policies and Foresight in Public Administration (PlanAPP)	Involved	H	H	H	H	L	L
Directorate-General for Health (DGS)	Involved	H	H	H	H	H	H
Professional Public Associations (Physicians and Nurses)	Involved	H	H	H	H	H	H
Statistics Portugal (INE)	Involved	H	H	L	L	L	L
Shared Services of the Ministry of Health (SPMS)	Involved	H	H	H	H	L	L

Domain 3: HWF planners' capabilities

Portugal has made **significant progress in strengthening HWF planning capabilities** throughout HEROES, with a clear focus on analytical skills, leadership and system-level understanding. Capacity-building efforts prioritized competencies directly relevant to workforce planning, including macro-level health system analysis, identification of workforce gaps across organizational and service levels, and the use of qualitative data to support evidence-informed decision-making.

A key achievement was the development and delivery of the **"International Course on Governance and Strategic Planning of the HWF".** ACSS delegated the operational implementation of the course to IHMT, this 50-hour course, delivered by national and international experts, provided structured training across five core areas: HWF environment and strategic planning, data analytics, planning and forecasting, HWF management, and leadership and systems thinking. The course fostered **peer learning**, exposure to **international practices**, and the exchange of practical experiences among staff from ACSS, DE-SNS and healthcare units, reinforcing professional networks and shared analytical approaches.

This training course was developed based on the WHO prototype "Human Resources for Health: Leadership and Management - A Prototype Curriculum Package.[31]

31 https://www.who.int/publications/i/item/9789240055940

Table 1. International Course on Governance and Strategic Planning of the HWF

MODULE	SKILLS
HWF Environment and Strategic HRH Planning	Understanding health system context, strategic HWF planning, linkage between population needs, healthcare delivery, and workforce requirements.
Data Analytics	Use and interpretation of HWF data, qualitative and quantitative analysis, evidence informed decision making.
Planning and Forecasting	Workforce forecasting methods, scenario analysis, medium and long term planning approaches.
HWF Management Skills	Recruitment and retention strategies, workforce motivation, career development, and organizational planning.
Leadership and System Thinking	Leadership in HWF governance; systems thinking, intersectoral coordination and policy engagement.

At the end of the course, a satisfaction questionnaire was administered to participants, the results of which indicated a high level of overall satisfaction with the course. Participants particularly highlighted the relevance of the topics covered, the quality of the content delivered, and the added value of sharing international practices and hands on experiences, which were regarded as especially relevant and useful for real world HWF planning contexts.

Despite these achievements, the analysis identifies **persistent skills gaps** that constrain the maturity of HWF planning. Skills remain limited in **advanced workforce modelling**, **financial impact assessment**, and **scenario-based and skill-mix analysis**, especially on the demand side. While progress has been made in data access and basic analysis, the ability to translate complex analytical outputs into robust policy options remains limited.

Leadership and systems-thinking skills also require further strengthening, notably to support intersectoral collaboration, anticipate emerging workforce challenges, and engage effectively with policymakers. These competencies are critical to ensuring that technical planning functions are connected to strategic decision-making and implementation.

Importantly, the HEROES experience has reinforced the need to frame capability development as **ongoing and institutionalized**, rather than project-based. Also highlights the importance of embedding continuous training in strategic HWF planning, data analysis, forecasting, and policy translation into regular professional development pathways. Institutionalizing these programmes is essential to sustain national planning capacity over time, reduce reliance on external expertise, and ensure the long-term effectiveness of HWF governance in Portugal.

To converge with more advanced systems, **Portugal should embed capability development as a permanent and institutionalized component of HRH governance**. This includes regular training programmes linked to career development, strengthened analytical teams capable of advanced modelling and financial assessment, and closer integration between technical planners and strategic decision-makers. Such an approach would allow Portugal to consolidate its position among intermediate systems and progressively move toward a more mature, forward-looking HWF planning model.

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Domain 4: HWF data and models

HWF Data: Sources

In Portugal, ACSS is responsible for coordinating and consolidating HWF information and statistics across the health sector, relying primarily on the RHV (Human Resources and Salaries) system, a centralized database of the National Health Service. Since 2016, RHV has incorporated all NHS workers, covering a wide range of professional categories. This represented a significant improvement and has substantially strengthened HWF planning capacity. Additional data sources complement the RHV, including demographic data from the INE, graduates' data from the Ministry of Science, Technology and Higher Education, and professional information from regulatory bodies such as the Portuguese Medical Association and the Portuguese Order of Nurses.

Supply-side data include detailed individual records for NHS workers, such as age, gender, profession, specialty, workplace, working hours, qualifications, contract type and remuneration. Inflow data cover graduates and postgraduate medical and pharmaceutical training, while outflow data include retirements, contract terminations, and deaths. Regarding mobility, professional councils regularly report on the number of applications for certificates recognizing healthcare qualifications. However, it remains unclear whether these applications result in actual mobility to other countries. On the inflow side, data is available on the stock of foreign healthcare professionals working in the NHS, based on nationality. Despite their availability, mobility-related data are not currently used in HWF planning.

Demand-side data consist mainly of population census indicators, including doctor to population and user ratios, particularly for general practitioners, as well as Human Resources Maps produced by NHS entities, which estimate future staffing needs across professional groups. However, due to the lack of systematic HWF planning processes, indicators of service utilization and epidemiological data have not been incorporated into planning practices.

Persistent gaps remain in Portugal's HWF data, particularly the lack of information from the private and social sectors. The National Inventory of Health Professionals (INPS)[1], created by Law no. 104/2015, has not yet been implemented due to legal and organizational barriers affecting data sharing.

Box 7 - HWF data planning: achievements, gaps and next steps

Portugal has established a solid foundation in **supply side HWF data,** supported by the RHV system and consolidated under ACSS. HEROES significantly strengthened this base by contributing to the **modernization of analytical tools,** notably through the development of the **"BI RH SNS", business intelligence system,** which integrates previously fragmented datasets and improves access to timely, policy relevant workforce information.

Despite recent improvements, demand side HWF planning in Portugal remains constrained by reliance on demographic projections and statutory ratios, **with limited use of epidemiological, service use and productivity data and a lack of information from the private and social sectors.**

Consolidating HEROES achievements requires institutionalising data integration, incorporating multi professional approaches, demand side modelling, and systematically linking analytical outputs to policy, planning and budgetary decisions.

Advanced Minimum Data Set: achievements under HEROES

The available data on HWF refers exclusively to the NHS. Regarding data from the private and social sectors, access through the INPS requires legislative amendments. To address this, ACSS has submitted a proposal to the Ministry of Health which, among other measures, aims to broaden the range of healthcare professionals covered and to resolve issues related to data provision.

Data on health service utilization, such as consultations, surgeries and overall service volumes, are available but are not currently used for HWF planning.

Regarding qualitative data, an academic study funded by PlanAPP and conducted by a research team from the IHMT was completed earlier this year. The study, entitled *"Assessment of Health Professionals' Satisfaction: Retention Factors in the NHS",* provides valuable insights that could inform future HWF planning. [32]

32 https://www.planapp.gov.pt/wp-content/uploads/2025/06/PLANAPP-SatisfacaoSaude.pdf

Quantitative data set	Supply side					Demand side	
	Labour force	Training	Retirement	Outflow migration	Inflow migration	Population	Health consumption
Profession	X	X	X		X		
Age	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
Specialisation	X	X	X		X		
Country of first qualification	Under development	X*	Under development		X		
Gender	X						
	Current situation: NHS only	*Information only for MDs in training (internship)	Current situation: NHS only	Current situation: Professional Councils	Current situation: NHS Only (foreign employees)		

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

Legend:

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

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HWF Data: improvements

From the beginning of HEROES activities, a business intelligence system called “BI RH SNS” was developed under Task 1 (T1) to strengthen access to integration and analysis of HWF data, thereby supporting more evidence-based decision-making in HWF planning and management. The system consolidates information that was previously fragmented across multiple sources, with a primary focus on the NHS workforce, while also incorporating data on undergraduate and postgraduate training, including medical internships.

Available data is clustered into several analytical domains: such as: (1) HWF stock and trends (e.g. age, gender, profession, specialty, workplace, working hours, qualifications, contract type and remuneration), (2) retirements and projections (including 10 year forecasts by medical specialty), (3) medical internships (admissions, completions and retention rates), (4) active retired physicians, (5) foreign healthcare professionals (by qualification, professional group, country of origin and regional distribution), and (6) graduate trends in medicine and nursing. In its initial phase, “BI RH SNS” is restricted to internal use within ACSS, with plans for its adoption by the Ministry of Health in the short term. The “BI RH SNS” system is still restricted to internal use within ACSS, as improvements related to the incorporation of new information and the introduction of artificial intelligence (AI) components are still ongoing.

Within Portugal’s HWF planning processes, demand estimation has traditionally relied on basic demographic projections. To strengthen the identification of demand-side indicators for HWF planning models, ACSS’s affiliated entity, IHMT, conducted a scoping review to map relevant indicators. This work identified key indicators across three main domains: (1) demographic trends, (2) epidemiological patterns, and (3) health service utilization. The findings of this scoping review will serve as a foundational input for the future definition of a comprehensive demand-side data set to support more robust and systematic HWF planning.

HEROES contributions to HWF data

Within the framework of the HEROES project, ACSS developed the “BI RH SNS” business intelligence system, consolidating previously fragmented data and strengthening evidence based HWF planning, with a primary focus on the NHS workforce stock and on undergraduate and postgraduate training. In parallel, a scoping review conducted by IHMT identified key demographic, epidemiological and health service utilization indicators, considered essential to support the future development of more robust demand side inputs for HWF planning models.

HWF Data: HEROES contributions and future directions

Future actions include the development of a standardized set of HWF indicators, formally approved at national level and aligned with national priorities, health strategies and quality benchmarks. In parallel, efforts will focus on modernizing the digital infrastructure to enable greater automation, data integration, and the adoption of user-friendly dashboards within a national data ecosystem, supported by internal audit and monitoring processes. In addition, new legislation and regulatory measures will be introduced to ensure the provision of a minimum data set and compliance with quality standards across regulatory bodies and both public and private providers, including the full implementation of the National Inventory of Health Professionals.

To strengthen demand-side data, further dimensions will be developed, namely epidemiological indicators and healthcare delivery metrics. Achieving these objectives will require strong collaboration and high-level coordination between ACSS and key stakeholders across the health sector. Specific protocols with professional associations will be necessary to obtain more accurate data on the emigration of health professionals, a phenomenon widely recognized as significant, particularly among physicians and nurses, but whose precise magnitude remains insufficiently documented.

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

The HWF forecasting model aims to forecast through the combined use of supply and demand-side variables, the staffing requirements for medical and nursing careers within the NHS over the 2026-2035 horizon, at both national and regional levels and across the four population-evolution scenarios developed by the INE. The model is designed to read and project, based on data from the past ten years, information related to undergraduate training (university education), postgraduate training (medical residency), and workforce flows within the NHS. HWF data is expressed in full-time equivalents and includes foreign professionals working in the NHS. In addition, the model allows users to simulate alternative assumptions beyond those derived from historical trends, enabling adjustments to key variables and immediate estimation of their impact on projected needs. While supply-side variables are relatively consensual and largely reflect entry and exit flows, there is less agreement regarding demand-side indicators.

Accordingly, the proposed model includes two types of projections: (1) primary healthcare, (2) hospital care, and an overarching projection of demand trends up to 2035 based on population ageing, using age-group dynamics weighted in accordance with legal provisions.

In primary healthcare, where projections focus on general practice/family medicine and public health specialties, demand is determined by statutory ratios currently defined in legislation for both medical and nursing staff. On the supply side, the model incorporates postgraduate training data and projects workforce stocks and exits among professionals allocated to functional units delivering family medicine or public health services.

Recognizing that demand for hospital care is influenced by multiple factors, currently the model only captures HWF needs through demographic change. Future developments aim to integrate service utilization indicators, epidemiological data not yet systematically used in planning, and a more granular analysis of labour market dynamics. It will be relevant to address disaggregation by hospital care specialties and incorporate additional variables beyond staffing ratios.

Regardless of the care setting, the model allows needs to be estimated under two assumptions: one aimed at determining the workforce required to maintain current staffing levels, and another assessing the gap between current stock and the workforce required either by statutory standards or as expressed by projected demand.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

Plans for HWF planning in Portugal are anchored in the sustainability framework developed under HEROES, with a clear strategic objective of consolidating HWF planning as a permanent and institutionalized function of health system governance. This implies moving beyond project-based initiatives towards stable arrangements that embed workforce planning within routine policy, planning, and budgetary cycles.

Key priorities include clarifying governance structures and mandates, reinforcing the roles and responsibilities of core stakeholders, and ensuring that analytical outputs are systematically linked to decision-making processes. Sustained political ownership, formalized coordination mechanisms between institutions, and the preservation and further development of the technical capacities created under HEROES are considered essential conditions for long-term sustainability.

The policy dialogue process has played a pivotal role in advancing these objectives. By convening a focused group of institutional stakeholders, the dialogues created a structured space for exchanging evidence, aligning perspectives and addressing constraints that affect workforce planning in practice.

This interaction strengthened coherence between technical analyses and policy priorities, fostered shared ownership of challenges and solutions, and reinforced institutional commitment to maintaining and further developing the planning capacities established through HEROES.

Importantly, the policy dialogues contributed to reframing HWF planning from a predominantly technical or administrative exercise into a strategic governance instrument. They highlighted the need for continuity beyond project timelines and emphasized the value of HWF planning in supporting system resilience, equity, and preparedness. By strengthening trust, clarifying expectations and establishing channels for ongoing collaboration, the dialogues enhanced the likelihood that reforms initiated under HEROES will be sustained, adapted to evolving needs, and progressively scaled over time.

Building on previous European initiatives, HEROES has made a decisive contribution to strengthening HWF planning and, consequently, to enhancing the resilience and sustainability of health systems. **A key lesson emerging from this experience is that progress in HWF planning is significantly accelerated through structured cooperation, peer learning, and the sharing of methodologies across countries.**

In this context, reinforcing and sustaining European cooperation mechanisms is of strategic importance. Maintaining an active and well-coordinated HWF planning network beyond the duration of HEROES will be essential to consolidate achievements, ensure continuity of knowledge exchange, and support the progressive alignment of data, methodologies and policy approaches across Member States. **Continued collaboration through new European initiatives will enable countries to address common challenges more effectively and to further embed data-driven, forward-looking workforce planning as a core function of health system governance.**

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COUNTRY REPORT SPAIN

6.6 COUNTRY REPORT: SPAIN

Introduction

National HWF Planning System before HEROES

Before the launch of the HEROES Joint Action (JA), Spain's HWF planning system was shaped by a highly decentralized governance model, reflecting the country's territorial organization into 17 Autonomous Regions, each with full responsibility for the planning, management, and deployment of its regional HWF. The Ministry of Health (MoH) played primarily a strategic and coordinating role, notably through the compilation of national-level data, the definition of overarching policy orientations, and coordination with other central institutions such as the Ministry of Education (-MoE- training capacity and numerus clausus) and the National Institute of Statistics (INE) for population and demographic projections for example. In addition, professional colleges, scientific societies, and trade unions contributed to regulation, standard setting, and labour negotiations. While this multilevel configuration enabled responsiveness to territorial needs, it also resulted in a concentration of decision-making authority at regional level, leading to fragmented criteria, heterogeneous planning horizons, and limited methodological alignment across the system.

From a process perspective, at the outset of HEROES Spain used a HWF planning model largely based on stock-based and trend-based analyses, relying on administrative and registry data to support short- to medium-term decisions. Core datasets covered HWF numbers by profession, age, gender, sector, and region, complemented by information on retirement patterns, education and training pipelines, and, to a lesser extent, mobility. Between 2020 and 2023, data availability, standardization, and inter-institutional exchange improved significantly, driven in part by the COVID-19 pandemic and the need for rapid workforce monitoring. These developments built on earlier European initiatives, particularly the First JA on HWF Planning and Forecasting (2013–2016) and the SEPEN Joint Tender (2020–2021), which strengthened analytical capacity and promoted greater data comparability. By the end of this period, Spain had consolidated a relatively robust descriptive data infrastructure, although its use remained predominantly reactive and demand-driven rather than anticipatory.

In terms of planning tools and responsibilities, the pre-HEROES situation was characterized by the coexistence of regional human resource plans, typically updated on a four-year cycle, and national analytical exercises with advisory value. Progress had been made through the adoption of national forecasting models developed by academic experts and endorsed by the MoH, particularly in relation to anticipating shortages in medical specialties and primary care. However, most tools remained profession-specific, focused mainly on physicians and nurses, and were insufficiently equipped to address evolving skill mixes, new professional roles, or organizational innovation. Responsibilities for translating analyses into policy action were dispersed across regions, universities, and social partners, often without a shared methodological framework. Consequently, persistent challenges (such as primary care shortages, territorial imbalances, coordination between education and service delivery, and emerging care models) were addressed in a largely reactive rather than anticipatory manner.

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Overall, this context defined the HEROES baseline for Spain as a system with strengthened data foundations and valuable experience from European Union (EU) collaboration, but still lacking an integrated, forward-looking, and competency-oriented HWF planning strategy.

HEROES: Key Achievements

Spain achieved a set of key milestones during HEROES, representing a significant step forward in strengthening its HWF planning system:

2023 – Establishing a shared national baseline for HWF planning

Spain consolidated a clear "as-is" baseline of its HWF planning system within HEROES, bringing together national and regional stakeholders around a common and explicitly articulated diagnosis. This milestone clarified roles, data gaps, and governance constraints in a decentralized system, and provided a shared reference framework for coordinated action across Autonomous Regions and the MoH.

2024 – National consensus on a Minimum Data Set (MDS) for HWF planning

Through a national Delphi study involving regional HR directors and national institutions, Spain achieved expert consensus on a validated MDS for workforce planning and forecasting. This represented a major step in formalizing and harmonizing essential variables at national level, directly addressing long-standing fragmentation in data definitions and priorities.

2024 – Strengthened collaboration with the MoH on central registries

HEROES supported intensified collaboration with the MoH to advance the development and populating of the central register of health professionals, including automated data flows from Autonomous Regions. This marked a shift from fragmented and ad hoc data collection towards more interoperable and systematized workforce information.

2025 – Upgrading forecasting models and academic–policy collaboration

Building on HEROES Task 2, Spain enhanced national forecasting capacity through closer collaboration with leading academic experts, improving projections for key professions and specialties. This milestone reflects a transition from predominantly descriptive analyses to more forward-looking and policy-relevant modelling approaches.

2025 – Investing in planning skills and institutional capacity

HEROES triggered targeted capacity-building actions, including a national training course on HWF planning at the MoE and expanded regional training initiatives. These actions strengthened analytical, strategic, and leadership skills among planners, addressing critical capacity gaps and reinforcing the institutional basis for sustainable HWF planning.

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HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

During HEROES, Spain's HWF planning and forecasting system evolved through three interlinked phases: adoption, implementation, and upscaling, reflecting a gradual but substantive shift in both policy thinking and institutional practice. The adoption phase (2023–early 2024) was primarily cognitive and strategic. HEROES provided a structured space for national and regional actors to jointly acknowledge the limitations of existing planning approaches—namely, fragmented data, profession-centric models, and reactive decision-making. A key outcome of this phase was a shared understanding that effective HWF planning in a decentralized system must be built on common concepts, agreed variables, and transparent assumptions, rather than on uniform organizational solutions. This marked a change in awareness: the objective was no longer to "centralize planning," but to enable comparability, coherence, and mutual trust across Autonomous Regions while respecting regional autonomy.

The implementation phase (mid-2024–2025) translated this shared understanding into concrete system components. The Delphi-based agreement on a national MDS crystallized a critical lesson: policy relevance depends not only on data availability, but also on feasibility, interoperability, and ownership by those who generate and use the data. Parallel work on central registries and forecasting models reinforced the insight that technical tools alone are insufficient unless accompanied by institutional coordination and skills development. As a result, HEROES helped reframe HWF planning as a multidisciplinary function requiring data analytics, policy interpretation, stakeholder dialogue, and leadership capacity at both national and regional levels. Importantly, regional actors were no longer treated merely as data providers, but as co-designers of the planning system, highlighting the importance of investing in their analytical and strategic capacities to ensure meaningful participation.

The upscaling phase (from late 2025 onwards) is defined less by new instruments but rather by a change in planning culture. HEROES has positioned HWF planning as a continuous, learning-oriented process rather than a periodic technical exercise. The main policy lesson emerging from this phase is that sustainability depends on embedding planning criteria (such as skills mix, demographic pressure, feasibility of indicators, and organizational adaptability) into routine governance and training structures. Spain's experience under HEROES underscores that in decentralized systems, scalability is achieved not through uniform models, but through shared standards, interoperable data, strengthened regional capacity, and sustained policy dialogue. These elements now constitute the main drivers shaping post-HEROES reforms in HWF planning and forecasting.

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

Domain 1: Political and contextual support

Spain has a tax-funded, universal National Health System (NHS) that provides comprehensive coverage to the population and is predominantly public in financing and provision, while allowing for a complementary private sector. The system is highly decentralized, with responsibilities for healthcare organization, service delivery, and HWF management fully transferred to the 17 Autonomous Regions, each operating its own regional health service. The central government, through the MoH, retains primarily coordination, regulatory, and strategic functions, including professional regulation, overall HWF policy orientation, and international commitments. Spain's large territorial extension, a population of around 48.5 million with high life expectancy, and its status as one of the world's most visited countries generate additional demand pressures and seasonal variability in service needs, further increasing system complexity.

Within this governance model, healthcare workforce planning is an essential but structurally challenging function. Regional authorities are responsible for staffing decisions, employment conditions, and organizational models, while key determinants of workforce supply (such as undergraduate and postgraduate training capacity) are shared with national institutions and the education sector. This division of responsibilities means that HWF planning must reconcile regional autonomy with national coherence, particularly for professions with long training pathways such as physicians and nurses. The coexistence of public and private providers, as well as significant internal and external professional mobility, further complicates the availability, comparability, and use of HWF data.

These contextual characteristics strongly shape the HWF planning process in Spain. Effective planning requires not only robust national frameworks and data standards, but also active involvement of regional stakeholders, professional bodies, and social partners to reflect territorial diversity and service organization differences. As highlighted in the AS-IS situation, the decentralized nature of the system makes consensus-building, shared criteria, and capacity development at regional level critical enablers of sustainable workforce planning. Consequently, Spain's approach increasingly recognizes that HWF planning must function as a multi-level, collaborative process, integrating demographic trends, service models, and regional realities within a shared strategic orientation.

Domain 2: Human Resources for Health (HRH) governance

In Spain, HWF planning is not entrusted to a single formal national planning institute but is embedded within the ordinary functions of government across multiple governance levels. The Autonomous Regions are the primary HWF planners in practice, as they are responsible for workforce management, recruitment, deployment, and organizational models within their regional health services. Each region typically has an HWF or Human Resources Directorate that develops medium-term HWF plans (often on a four-year cycle), primarily to support budgeting, staffing, and service organization decisions.

At national level, the MoH performs a strategic, coordinating, and regulatory role, rather than direct operational planning. It is responsible for defining common policy orientations, coordinating national analyses, managing (or promoting) central workforce registries, and aligning workforce planning with broader health system goals. HWF planning is therefore embedded in ministerial units dealing with professional organization, human resources, and health system strategy, rather than in an autonomous planning body. HWF supply determinants (such as undergraduate and postgraduate training capacities) are shared with the MoE, making inter-ministerial coordination a structural requirement for effective HWF planning.

Governance of HWF planning is thus network-based rather than hierarchical, involving public authorities, professional bodies, scientific societies, and trade unions. HEROES reinforced the recognition that HWF planning effectiveness depends not only on formal mandates but also on stakeholder alignment, data ownership, and analytical capacity, particularly in a decentralized system such as Spain's. As a result, Spain's HWF planning structure relies on cooperation mechanisms, technical working groups, and policy dialogue, rather than on a single authoritative planning institution.

The stakeholders involved in HWF planning in Spain reflect the decentralised and plural governance structure of the health system. Public authorities at national and regional levels are key, but effective planning also depends on the participation of professional colleges, scientific societies, trade unions, academic experts, and data institutions. While these actors differ in power and interests, their inclusion is essential to ensure technical validity, professional acceptability, and policy feasibility. HEROES highlighted the need to further strengthen the role of regional planners and analytical experts, and to progressively integrate underrepresented actors such as private providers into a more comprehensive HWF planning ecosystem.

In Spain, HWF planning operates through a multi-level and multi-actor system in which roles and responsibilities are differentiated according to legal competences, access to data, and capacity to influence policy decisions.

The Autonomous Regions are the core operational planners. They manage employment, define staffing needs, negotiate contracts, and translate planning outputs into concrete recruitment and deployment decisions. Their high level of interest and power derives from their direct accountability for service delivery and budgets. The MoH, by contrast, holds a strategic and coordinating role, providing regulatory frameworks, national analyses, and common reference points (e.g. registries, guidelines, forecasts), but with limited authority to impose planning decisions on regions. This explains its high interest, but only partial control over implementation. The MoE has a decisive influence on long-term workforce supply through regulation of training capacity and curricula, yet its interest in HWF planning is indirect, primarily shaped by educational priorities rather than service delivery needs.

Other stakeholders are classified according to their influence on feasibility and legitimacy, rather than direct planning authority. Professional colleges and scientific societies have medium-to-high interest because planning outcomes affect professional standards, scopes of practice, and specialty development. Their power lies primarily in agenda-setting, technical advice, and professional acceptance, not in formal decision-making. Trade unions possess relatively high power due to their role in collective bargaining and labour regulation, even though their planning horizon is often short-term and employment-focused rather than strategic. Universities and academic experts contribute to modelling, forecasting, and methodological innovation. Their interest is high, but their power remains advisory, increasing only when their work is taken up by policymakers, as observed during HEROES.

Certain actors play a limited role in Spain's HWF planning system due to structural and institutional reasons. Local health authorities and individual providers (e.g. hospitals or primary care centers) have high operational interest, but low strategic power, as they do not control training pipelines, regulatory frameworks, or budget envelopes; their input is usually channeled indirectly through regional administrations. Similarly, private healthcare providers employ a significant share of professionals but are weakly integrated into public planning mechanisms, which reduces both their influence and the completeness of planning data. Statistical bodies such as the National Institute of Statistics have low interest, but essential technical power, as they supply demographic and labour market data underpinning demand projections. Overall, the classification of stakeholders reflects a system in which decision power is concentrated at regional level, strategic coordination at national level, and legitimacy and feasibility depend on engagement with professional, social, and technical actors (an arrangement that HEROES helped to make more explicit and better aligned).

The table below shows the key stakeholders in the Spanish HWF planning process.

Stakeholder	Level	Role in HWF planning	Main interests	Level of power	Comments / relevance
Ministry of Health	National	Strategic coordination, regulation, national analyses, registries	Sustainability of NHS, shortage mitigation, policy coherence	H	Key national coordinator; limited direct control over regional implementation
Autonomous Regions (Health Services)	Regional	Operational workforce planning, recruitment, deployment	Adequate staffing, budget control, service continuity	H	Core planners in practice; heterogeneous capacity and tools
Ministry of Education	National	Regulation of undergraduate and postgraduate training capacity	Alignment of education supply, academic planning	M-H	Critical for long-term supply; coordination challenges
National Institute of Statistics (INE)	National	Demographic and labour market data provision	Data quality, statistical consistency	M	Essential input for demand modelling
Professional Colleges (Medical, Nursing, etc.)	National / Regional	Registration, professional standards, advocacy	Professional interests, regulation, workforce conditions	M	Strong influence on acceptability of planning measures
Scientific Societies	National	Technical expertise, specialty-specific advice	Quality of care, specialty development	M	Important for specialty forecasting and skills definition
Trade Unions	National / Regional	Labour negotiation, workforce conditions	Employment stability, working conditions	M-H	Strong influence on implementation and workforce policies
Universities / Academic experts	National / Regional	Modelling, forecasting, research support	Evidence-based policy, methodological quality	M	Increasingly influential through HEROES collaborations
Private healthcare providers	National / Regional	Employment of health professionals	Workforce availability, flexibility	M	Limited integration in public planning data
HWF planners / HR units	Regional	Technical planning, data analysis, implementation	Practical tools, capacity building	M	Capacity varies significantly across regions

Domain 3: HWF planners' capabilities

Actors involved in HWF planning in Spain bring complementary and differentiated expertise. The MoH is responsible for national health policy orientation, regulatory frameworks, and strategic coordination, including the promotion of common data standards and national analyses. The Autonomous Regions, which hold primary responsibility for healthcare delivery, have in-depth knowledge of regional service organization, employment conditions, and territorial health needs, and therefore play a central role in operational planning. Professional colleges and scientific societies contribute to expertise on professional regulation, scope of practice, specialty development, and continuous professional development. The integration of these perspectives is essential to ensure coherence between national strategies, regional realities, and professional frameworks, and to align information and assumptions across actors in a highly decentralized system.

To effectively execute HWF planning activities in Spain, three layers of skills are required. The first is technical capacity. HWF planners need basic digital and analytical skills, as well as an understanding of the logic, formulas, and assumptions underlying forecasting and planning models. They must be able to manage, interpret, and critically select data appropriate to specific planning questions. Currently, these skills are unevenly distributed across regions.

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In particular, the capacity to interact effectively with IT and information systems units (which is crucial for data extraction, interoperability, and automation) is increasingly important but not consistently developed at regional level.

The second layer relates to system-level knowledge of the healthcare sector. Planners should understand broader health system trends, reforms, and financing mechanisms to assess how changes in demand, service models, or funding translate into HWF needs. Familiarity with regional organizational models, professional roles, and care settings is essential, even if this knowledge is often more conceptual than operational. In practice, competencies related to labour market analysis and financial assessment are frequently located in other units within regional administrations, requiring effective coordination rather than being fully internalized within HWF planning teams.

The third layer concerns personal and relational competencies, which are particularly critical in the Spanish context. HWF planning relies heavily on coordination among multiple actors, including regional departments, professional bodies, and occasionally local healthcare organisations. However, the ability to systematically involve all relevant stakeholders (such as personnel offices in hospitals or primary care organisations) remains uneven across regions. This is compounded by high staff turnover, especially at regional level, which necessitates recurrent introductory training and hinders the accumulation of institutional knowledge. Moreover, responsibilities for HWF planning are not standardized across regions, either in terms of organizational location or required competencies. While individual expertise and initiative often compensate for these gaps, more structured capacity-building and clearer role definition remain necessary to strengthen planning effectiveness.

During HEROES, Spain used the project budget to initiate targeted training activities aimed at strengthening HWF planning capacity among key stakeholders, with a particular focus on national and regional planners. The main training milestone took place in 2025, with a dedicated HWF planning course hosted by the MoH in Madrid, addressed primarily to staff from Autonomous Regions and central administration units involved in workforce analysis and policy support. In parallel, HEROES supported dissemination and training activities linked to the Delphi study on the MDS, helping stakeholders better understand the logic of planning indicators, feasibility constraints, and the use of data for forecasting. Additional training actions were prepared or co-organized with regional and academic partners (e.g. Andalusian School of Public Health –EASP- and Institut Català de la Salut), some of which are expected to continue beyond the formal duration of HEROES.

In terms of skills improvements, the training mainly contributed to strengthening the technical and analytical capacities for HWF planning. Participants improved their understanding of planning and forecasting concepts, data requirements, interpretation of indicators (e.g. retirements, inflows, Full-Time Equivalents –FTEs-), and the limitations of existing data systems. The courses also enhanced awareness of the need for interoperability, collaboration with IT units, and critical use of projections rather than purely descriptive statistics. Beyond technical aspects, the training fostered a shared language among national and regional actors, improving mutual understanding and coordination, which is particularly relevant in a decentralized system like Spain's. However, gains in advanced modelling, financial analysis, and skills-based planning were more modest, reflecting both time constraints and the heterogeneity of participants' initial competencies.

Not all skills identified as priorities in earlier HEROES assessments could be addressed during the project lifespan. Limitations included the restricted number of training sessions, competing workloads of regional staff, and the difficulty of tailoring content to very diverse institutional contexts. As a result, the training strategy focused on highest-priority needs (including foundational planning concepts, data use, and shared criteria) rather than on more specialized or long-term capacity gaps, such as leadership development or comprehensive skills-mix modelling. Importantly, HEROES helped position training as a continuous requirement rather than a one-off activity.

Several partners have already planned follow-up courses and online training offers after HEROES, reinforcing capacity building as a key component of sustainability and institutionalization of HWF planning improvements in Spain.

In conclusion, the HEROES training activities in Spain have contributed to strengthening the technical, analytical, and coordination skills of HWF planners, particularly at national and regional levels. The training helped consolidate a shared understanding of planning concepts, data requirements, and forecasting logic, fostering a more informed and connected community of practice within a decentralized system. These achievements support the sustainability and progressive institutionalization of HWF planning, enhancing Spain's capacity to better anticipate workforce needs, address territorial imbalances, and respond more proactively to evolving healthcare demands and organizational change.

Complementing these training activities, a national hackathon on HWF planning was organised. The hackathon was coordinated by the EASP, bringing together over 30 professionals from the MoH, Autonomous Regions, training institutions, clinicians from different disciplines, trade unions, and patient representatives. Through co-design methodology, three complementary prototypes were developed to address service reorganization from a HWF perspective, specifically a functional model for Family and Community Care Units centered on community health, including: (1) a longitudinal competency assessment system integrating undergraduate, residency, and continuous education, and (2) an organizational model based on self-managed mini-teams with incentives linked to continuity of care. The prototypes, currently under validation, represent multi-stakeholder consensus on key elements for transforming primary care. This experience illustrates that effective HWF planning requires bridging fragmentation between management, training, clinical practice, and professional representation.

Domain 4: HWF data and models

HWF Data: Sources

In Spain, HWF planning relies on multiple public data sources, with a clear differentiation between supply-side and demand-side information. Supply data are mainly provided by the MoH (through data collected from the Autonomous Communities), the MoE (students, graduates, and training pipelines), and professional registries. The data consist of HWF stock by profession, age, gender, sector, and region, retirement patterns, inflows of foreign-trained professionals, training positions, and remuneration. Demand-related data are primarily sourced from the INE and regional health authorities, and include population size and structure, demographic and epidemiological trends, and service utilization proxies. While supply data are more developed and routinely used in HWF planning, demand data are less systematically integrated, often applied indirectly or on an ad hoc basis, reflecting both data limitations and the decentralized organization of the system.

Throughout HEROES, several relevant improvements in HWF data were achieved in Spain, building on an already relatively extensive supply-side information base. A major effort focused on improving the collection, structuring, and harmonization of data on medical specialties, including headcounts, age and gender distribution, and training pathways (undergraduate, postgraduate, and residency levels). This represented a key advance in strengthening consistency and comparability of data across Autonomous Communities, enabling more robust national-level analyses and projections.

On the demand side, HEROES facilitated better integration of existing data on population age and gender structure, demographic projections, and selected indicators of healthcare utilization into planning and forecasting exercises. In addition, the HWF planning framework now allows for the qualitative incorporation of organizational, epidemiological, and technological changes, recognizing their differentiated impact across regions and professional groups. These elements are primarily captured through ad hoc data collection and structured stakeholder consultations rather than routine statistical sources.

Finally, one of the most important improvements achieved during HEROES is not immediately visible in standard data tables. Through closer collaboration between the MoH and the Autonomous Regions, progress was made in advancing and populating the central register of health professionals, including more systematic and automated data flows. While this did not substantially expand the range of variables available, it significantly improved the accuracy, consistency, and reliability of HWF data, thereby strengthening the overall foundation for planning and forecasting.

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		
Age	X	X	X	X	X	X	X
Head count	X	X	X	X	X	X	X
FTE	X (1)						
Geographical area	X	X	X		X	X	X
Specialisation	X	X	X		X		
Country of first qualification	X	X	X		X		
Gender	X	X	X	X	X	X	X
	(1) Health-care organ-isations and local govern-ments have the Full Time Equivalent						

Legend:

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

Qualitative data set		
	Care organisation	
Teamwork	X	
Task shifting and skill-mix	X	Different levels of development according to the region
Reconfiguring health services including digital	X	There is a digital transformation plan ongoing
	Health indicators	
Mortality and morbidity of HWF	X	
Mental health and well-being of HWF	X	Healthcare organisations and Professional associations have the best data on this topic in Spain
HWF equity	X	
	Labour market	
Financial investment, economical background	X	
Performance and productivity	X	

HWF Data: improvements

During HEROES, Spain implemented a coherent set of HWF data improvements and data-related actions aligned with its national Action Plan and directly responding to gaps identified in the AS-IS analysis. A central achievement was the establishment of a national consensus on essential HWF data, achieved through a structured Delphi process involving national institutions and regional health services. This process defined a shared MDS for planning and forecasting, clarifying priority variables, feasibility constraints, and common definitions. The MDS provided a stable reference framework for harmonizing data collection across Autonomous Communities and for guiding subsequent improvements in registries, models, and policy dialogue.

On the supply side, HEROES actions focused on improving the quality, consistency, and usability of existing HWF data rather than expanding their scope. Collaboration between the MoH and the Autonomous Communities intensified, with progress towards automated data extraction, validation, and reporting, particularly in regions with more advanced information systems. Validation mechanisms based on source verification, cross-checking, and feedback loops were strengthened to increase data reliability. Although full interoperability standards are still under development, regional systems increasingly align with national objectives, laying the groundwork for more timely and comparable workforce intelligence.

In parallel, HEROES supported the refinement of national planning and forecasting models, notably those developed by academic experts and already used by the MoH to estimate medium- and long-term supply and demand scenarios. The agreed MDS is now being progressively integrated into these models, improving their robustness, transparency, and policy relevance. Enhancements include better incorporation of demographic projections, training pipelines, retirement patterns, and labour market dynamics. While demand-side data remain less granular than supply data, HEROES facilitated more systematic use of population structure and service-related proxies, as well as the qualitative consideration of organizational, epidemiological, and technological changes through expert consultation.

Beyond technical data work, HEROES promoted innovative, participatory approaches to data use and planning. A key example was the JA HEROES Hackathon held in Granada in November 2025, which brought together national and regional authorities, academic institutions, professional bodies, technology experts, and other stakeholders. The event highlighted the need for more robust information systems, anticipatory data use, and integration of competencies, mobility, and organizational factors into HWF planning. Outputs from the Hackathon fed into ongoing work on data, models, and governance, reinforcing cross-sector collaboration and shared ownership of planning challenges.

Overall, HEROES enabled Spain to move from fragmented and ad hoc data use towards a more structured, consensus-based, and forward-looking HWF data ecosystem. While not all ambitions could be fully realized within the project lifespan, the actions completed have significantly strengthened data foundations and created clear pathways for continued improvement and sustainability beyond HEROES.

HWF Data: HEROES contributions and future directions

Following the completion of HEROES, Spain plans to consolidate and expand the progress achieved in HWF data and modelling through a set of sustainability-oriented actions embedded within existing governance and policy processes. The primary strategic objective is to institutionalize HWF data collection, analysis, and use as a routine function of the NHS, rather than as a project-based activity. HEROES has clarified priorities, roles, and feasibility constraints, thereby providing a realistic and actionable roadmap for the post-project phase.

A first core line of action concerns the progressive operationalization of the agreed MDS. After HEROES, the MDS will serve as the reference framework for national and regional data improvements, guiding investments in information systems and interoperability.

The MoH, in collaboration with the Autonomous Communities, plans to continue advancing the central register of health professionals, strengthening automated data flows, validation mechanisms, and comparability across regions. While full national interoperability cannot be achieved in the short term due to structural and legal constraints, future efforts will prioritize incremental alignment, focusing on high-impact variables such as retirements, training pipelines, FTEs, vacancies, and attrition.

A second strategic priority is the further refinement and routine use of forecasting and planning models. The national models already used to inform medium- and long-term supply–demand scenarios will be progressively updated using higher-quality data derived from the MDS. Post-HEROES plans include improving scenario analysis capabilities, strengthening links between demographic trends and workforce needs, and increasing transparency around assumptions and uncertainty. Rather than developing a single uniform model, Spain will continue to favor a federated approach, allowing regions to adapt tools to their specific contexts while maintaining coherence through shared data standards and methodological principles.

Sustainability actions also strongly emphasize capacity building and skills retention. Training activities initiated during HEROES are expected to continue beyond the project, with follow-up courses, online modules, and integration of HWF planning topics into existing public health and management training programmes. This responds directly to lessons learned during HEROES regarding staff turnover and uneven analytical capacity at regional level. Ensuring that planners can interpret data, interact with IT units, and engage in evidence-informed policy dialogue is considered essential for sustaining and fully leveraging improvements in data and modelling.

Finally, Spain intends to maintain and strengthen policy dialogue and stakeholder engagement mechanisms launched under HEROES. Future policy discussions will increasingly use shared data and projections as a neutral evidence base to address sensitive issues such as shortages, territorial imbalances, and skill mix evolution. In this sense, HEROES is seen not as an endpoint but as a catalyst: its main legacy lies in establishing common criteria, shared awareness, and collaborative practices that will continue to shape HWF data and planning policies in the years ahead, reinforcing a more coordinated, transparent, and learning-oriented governance approach.

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

Spain's principal HWF planning and forecasting model was developed progressively between 2018 and 2022 by academic experts, in close collaboration with the MoH. The model was created to respond to growing concerns about medical workforce shortages, ageing of professionals, and misalignment between training capacity and future healthcare needs. Its primary policy goal is to inform national decision-making on medical specialty training positions, medium- and long-term workforce sustainability, and strategic debates on shortages and territorial imbalances.

The model is applied at national level, with results often disaggregated by medical specialty and, in some cases, by care sector (e.g. primary care versus hospital care). While physicians are the main focus, extensions and parallel analyses have increasingly included nursing and other key professions, depending on data availability. Regions use the outputs as a reference, but retain autonomy in operational HWF decisions, reflecting the decentralized governance structure of the system.

On the supply side, the model follows a stock-and-flow approach, primarily based on headcounts, with partial use of FTEs where data allow. It projects future HWF capacity by modelling inflows (graduates, specialty training completion, foreign-trained professionals) and outflows (retirements, mortality, attrition). Training pipelines, average retirement ages, and policy-relevant assumptions (e.g. changes in training intake) are explicitly modelled, ensuring alignment with policy-relevant scenarios.

On the demand side, future HWF needs are estimated mainly through demographic projections (population size, age and sex structure) combined with assumptions about service utilization patterns and care delivery models. Demand estimation is scenario-based rather than norm-based, using expert knowledge to account for epidemiological trends, organizational changes, and technological developments. Demand modelling remains less granular than supply modelling, reflecting persistent data constraints and methodological challenges identified in the AS-IS analysis.

The gap between supply and demand is defined differently for the current and future situations. In the present, imbalances are assessed using a combination of observed shortages, vacancy signals, reliance on non-specialist physicians, and qualitative evidence from regions. For the future, gaps are estimated by confronting projected supply and demand trajectories, allowing identification of potential shortfalls or surpluses by specialty and time horizon rather than applying fixed staffing norms.

In terms of policy use, the model primarily supports:

- Regulation of training inflows, particularly the number of medical intern resident (MIR) positions, by specialty.
- Strategic recruitment and retention discussions, including delayed retirement and international recruitment.
- Medium- and long-term workforce sustainability analysis, rather than short-term operational staffing decisions.

The model is mainly single-occupation oriented, although HEROES has reinforced awareness of the need to move towards multi-occupational and skill-mix perspectives. It does not directly model task-shifting or substitution, but its results are increasingly used to inform debates on new roles and organizational redesign. The model has limited direct application to cost containment or health consumption control, though it indirectly informs efficiency discussions by anticipating shortage-driven pressures.

Formal, systematic evaluation of the model has not been conducted to date. This reflects both the complexity of attributing policy outcomes to forecasts and the model's role as a decision-support tool rather than a prescriptive instrument. Nevertheless, it has undergone iterative refinement through repeated use, expert review, and (during HEROES) through improvements in data inputs and greater transparency of underlying assumptions. HEROES has therefore strengthened the foundations for future evaluation and methodological development rather than delivering a definitive assessment within the project timeframe.

During HEROES, Spain implemented a set of structural and enabling actions that strengthened HWF planning beyond isolated technical improvements. A major update was the formalisation of a shared national reference framework for HWF data, achieved through the Delphi consensus on a MDS. This action addressed a long-standing gap in Spain's decentralised system by establishing agreed variables, definitions, and priorities, creating a common language for planning across Autonomous Communities and the MoH.

In parallel, HEROES supported progress in the central register of health professionals, with closer collaboration between national and regional authorities and advances in automated data extraction, validation, and reporting in several regions. These actions improved data consistency and reliability, even if full interoperability could not be achieved within the project timeframe. HEROES also contributed to the refinement and continued use of national forecasting models, ensuring that projections increasingly rely on harmonised and higher-quality data.

Capacity building was another key achievement. Using HEROES funding, Spain organised targeted training activities in 2025, notably a national course on HWF planning at the MoH and dissemination activities linked to the Delphi study. These actions strengthened technical, analytical, and coordination skills among planners and fostered a more connected community of practice. Finally, innovative and participatory initiatives such as the JA HEROES Hackathon in Granada expanded stakeholder engagement and reinforced awareness of the need for anticipatory, data-informed planning that integrates competencies, organisational change, and equity considerations.

After HEROES, Spain's priorities focus on institutionalising and scaling up the progress achieved. A central sustainability action is the progressive operationalisation of the MDS as the reference for national and regional HWF data systems. Rather than launching new parallel datasets, post-HEROES efforts aim to embed the MDS into existing information infrastructures, prioritising high-impact variables such as retirements, training pipelines, FTEs, vacancies, and attrition.

Another key line of work is the continued refinement of forecasting and planning models, integrating improved data flows and expanding scenario analysis capabilities. Spain plans to maintain a federated approach to modelling allowing regional adaptation while reinforcing coherence through shared standards and transparent assumptions. This is expected to improve the credibility and policy uptake of projections, particularly for training inflow regulation and medium-term sustainability debates.

From a governance and capacity perspective, training activities initiated during HEROES are expected to continue beyond the project, through follow-up courses, online modules, and integration into existing public health and management training programmes. This responds directly to lessons learned about staff turnover and uneven regional capacity. In parallel, policy dialogues launched under HEROES will increasingly use shared data and projections as a neutral evidence base to address sensitive workforce issues.

Overall, Spain views HEROES as a catalyst rather than an endpoint. The main legacy lies in strengthened data foundations, clearer planning criteria, improved skills, and a shared awareness that sustainable HWF planning in a decentralised system depends on continuity, collaboration, and learning-oriented governance well beyond the project's formal duration.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

Future plans for HWF planning in Spain build directly on the sustainability milestones agreed within HEROES (milestones 14, 20, and 26), developed in close collaboration with Work Package 4. These milestones reflect a deliberate shift from project-based outputs to embedded, long-term system change. Milestone 14 focused on consolidating the foundations for sustainability by anchoring agreed data standards, planning concepts, and governance principles within existing national and regional structures. This ensured that key HEROES outputs (such as the MDS, shared analytical criteria, and planning logic) are embedded as reference elements within routine HWF planning activities rather than treated as temporary deliverables.

Milestone 20 marked the transition towards operational sustainability, emphasizing the progressive integration of HEROES results into policy cycles, information systems, and capacity-building frameworks. This included reinforcing the role of the MoH as a coordinator and enabler, while empowering Autonomous Communities to apply shared tools and standards according to their specific contexts. Importantly, sustainability was framed not as uniformity, but as coherence across diversity, recognizing the decentralized nature of Spain's health system. Milestone 26 further reinforced this approach by focusing on continuity beyond HEROES, highlighting training pathways, data governance arrangements, and ongoing policy dialogue as critical mechanisms to maintain momentum, ensuring that progress achieved during HEROES is sustained and further developed over time.

The policy dialogue process played a key role in translating these milestones into sustainable impact. Rather than producing isolated policy commitments, the dialogues fostered a shared understanding of planning challenges, feasibility constraints, and trade-offs among national and regional actors. This has strengthened trust, improved alignment, and increased the likelihood that HWF planning will remain a standing item in strategic discussions after HEROES.

Overall, future HWF planning in Spain is expected to benefit from more stable data foundations, clearer roles, and a culture of continuous dialogue—all of which are essential conditions for sustaining and progressively advancing workforce planning policies over time.

List of Acronyms

AS-IS – Baseline situation prior to intervention
EASP – Andalusian School of Public Health
EU – European Union
FTE – Full-Time Equivalent
HWF – Health Workforce
HWF Planning – Health Workforce Planning
INE – National Institute of Statistics (Instituto Nacional de Estadística)
JA – Joint Action
MDS – Minimum Data Set
MIR – Medical Intern Resident (specialist training system in Spain)
MoE – Ministry of Education
MoH – Ministry of Health
NHS – National Health System
SEPEN – Support for Health Workforce Planning and Forecasting (EU Joint Tender)

ANNEX 1. STAKEHOLDER LIST

Name of the stakeholder	Type of stakeholder	Involvement in the HWF planning process	Data		Process and tools		Skills	
			I	P	I	P	I	P
SATSE (nurses trade union)	Other	Already involved	H	L	L	L	L	L
CEMS (State Confederation of Medical Unions)	Other	Already involved	H	L	L	L	L	L
CSIF (Independent and Civil Servants Union Central)	Other	Already involved	H	L	L	L	L	L
UGT (General Workers' Union)	Other	Already involved	H	L	L	L	L	L
CCOO (Workers Commissions)	Other	Already involved	H	L	L	L	L	L
SEMFyC (Spanish Society of Family and Community Medicine)	Academia	Already involved	L	L	H	L	H	L
OMC (Spanish Collegiate Medical Organization)	Health Professional Order	Already involved	L	L	H	L	H	L
FAECAP (Federation of Associations of Family and Community Nursing)	Academia	Already involved	L	L	H	L	H	L
CGE (General Council of Nursing)	Health Professional Order	Already involved	L	L	H	L	H	L
SEDISA (Spanish Society of Health Managers)	Academia	Already involved	H	L	H	L	H	H
ANDE (National Association of Nursing Directors)	Academia	Not yet involved	H	L	H	L	H	L
CRUE (Conference of rectors of Spanish universities)	Academia	Already involved	L	L	H	L	H	L
Nursing Deans Conference	Academia	Not yet involved	L	L	H	L	H	L
Medical Deans Conference	Academia	Already involved	L	L	H	L	H	L
Spanish Ministry of Health	National Authority	Already involved	H	H	H	H	H	H
Human resources director of Andalusia region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Aragon region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Balearic Islands region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Cantabria region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Islas Canarias Region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Castilla la Mancha region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Castilla y León region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Catalunya region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Madrid region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Navarra region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Valencia region	Local / Regional Authority	Already involved	H	H	H	H	H	H

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Name of the stakeholder	Type of stakeholder	Involvement in the HWF planning process	Data		Process and tools		Skills	
			I	P	I	P	I	P
Human resources director of Extremadura region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Galicia region	Local / Regional Authority	Already involved	H	H	H		H	H
Human resources director of Pais Vasco region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Asturias region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of Murcia region	Local / Regional Authority	Already involved	H	H	H	H	H	H
Human resources director of La Rioja region	Local / Regional Authority	Already involved	H	H	H	H	H	H

COUNTRY REPORT SWEEDEN

6.7 COUNTRY REPORT: SWEDEN

Introduction

National HWF Planning System before HEROES

Sweden's health and dental care system is publicly financed and highly decentralised. The 21 regions are responsible for providing health care, while the 290 municipalities are responsible for large parts of elderly care and municipal health care. This means that HWF planning is carried out at several levels, with national authorities mainly supporting the system through data, analysis, knowledge support and follow-up.

Sweden entered HEROES with relatively strong national data sources. Statistics Sweden holds population-based workforce data that is regularly updated and includes information on for example education, employment, residence, income and workplace. The National Board of Health and Welfare also holds registers on licensed health professionals and medical and dental specialties. Data quality is generally considered good, and both public and private sectors are covered.

At the same time, the main challenge was not only access to data, but how data is used in planning. Workforce planning remains decentralised, and available data is not always sufficiently linked to health care needs, service organisation or local decision-making. Sweden also lacks national primary care data comparable to specialist care data, which limits the possibility to fully analyse health care consumption across the system.

HEROES started at a time when Sweden was already working to strengthen long-term workforce planning. The Joint Action has supported this work by helping Sweden move from separate data and analysis activities towards a more learning-oriented approach. A central result is the development of a national learning system for workforce planning, where data, regional experience, stakeholder dialogue and practical testing are used together to support more sustainable use of health and dental care personnel.

HEROES: Key Achievements

Through its participation in HEROES, Sweden has gained several important outcomes, including:

2023–2025: Strengthened collaboration on workforce data

Collaboration between the National Board of Health and Welfare, Statistics Sweden and the Swedish Higher Education Authority has been strengthened, leading to improved data validation processes and more consistent use of register-based data in workforce analysis.

2024–2025: New analyses of labour market dynamics

New analyses on labour market movements, including nurses' mobility between sectors and regions, have improved the understanding of workforce flows and provided a more robust basis for planning and policy discussions.

2024–2025: Development and testing of the Capability Framework

Sweden has developed and tested the Capability Framework as a complement to existing planning approaches. The framework shifts the focus from professions to capabilities needed to deliver care and has been applied in pilot areas such as child and adolescent psychiatry and dental care.

2024–2026: Establishment of a national learning system for workforce planning

A major result of HEROES in Sweden is the development of pilot activities that have established the foundations for a national learning system. Through regional pilots, mentorship, Safety II methods and structured learning processes, Sweden has tested how data, analysis and stakeholder dialogue can be combined in practice.

This represents a shift from one-off analyses towards a more continuous approach, where data is actively used for joint reflection, problem formulation and decision support across levels of the system.

2024–2025: Policy dialogues linked to concrete planning challenges

Policy dialogues have been carried out in areas such as psychiatry, dentistry and specialist physician planning. These dialogues have contributed to a more structured involvement of stakeholders and have been used to link data and analysis to concrete workforce planning challenges.

2025: Strengthened mutual learning and international collaboration

Bilateral exchanges, particularly with Norway, have contributed to the development of Swedish approaches to data use, forecasting and capability-based planning, and have strengthened institutional cooperation beyond the project period.

HEROES: Lessons learned

Adoption, implementation and upscaling of HWF Planning

A key lesson from HEROES is that strong data alone is not sufficient for effective workforce planning. The main challenge is to create structures where data can be interpreted and used jointly by actors at different levels.

The Swedish experience shows that workforce planning needs to be understood as a continuous learning process rather than a purely technical forecasting exercise. The pilot work has demonstrated that combining data, stakeholder dialogue and practical testing can improve the relevance and usability of analysis.

Another lesson is that planning approaches need to be adaptable to regional and local contexts. The Capability Framework has supported this by focusing on how care is delivered and what capabilities are needed, rather than only on professional categories.

Finally, sustained stakeholder engagement is necessary. Policy dialogues have been useful for creating shared understanding, but maintaining these processes beyond the project period remains a key challenge.

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

Domain 1: Political and contextual support

Sweden has a publicly funded and highly decentralised health and dental care system, where regions and municipalities as well as private healthcare providers are responsible for service delivery and workforce planning. This creates flexibility but also challenges for coordination and long-term planning across levels.

The need for strengthened workforce planning has become more evident due to demographic developments, workforce shortages and increasing demand for care. In particular, there is a growing need to ensure more effective use of existing personnel rather than continued expansion of the workforce.

HEROES has supported ongoing national work in this area, including government initiatives on long-term staffing, primary care and sustainable workforce supply.

A key development is the introduction of a learning-based approach to workforce planning. This approach aims to better connect national analysis with regional and local decision-making, and to support more continuous adaptation of planning to changing conditions.

Overall, HEROES has contributed to strengthening the policy relevance of workforce planning by linking data, analysis and stakeholder dialogue more closely to ongoing national and regional processes.

Domain 2: Human Resources for Health (HRH) governance

HWF governance in Sweden is distributed across multiple organisations and levels. Regions and municipalities hold the primary operational responsibilities as service organisers and employers. National Board of Health and Welfare contributes through national planning support, statistics and analysis, while other actors contribute through statistics, education regulation and analysis, professional perspectives and labour-market roles.

During HEROES, National Board of Health and Welfare coordinated cross-regional pilot activities and connected learning to policy dialogue and national planning support. Several elements in Socialstyrelsen's recent strategic direction align with the approaches and working methods developed through HEROES, notably an emphasis on practice-oriented support and a shared national perspective. Sweden's documentation also notes a formal change in National Board of Health and Welfare's government mandate, which encourages more practice-oriented and operationally close work where appropriate, while maintaining the existing division of responsibilities between national, regional and municipal levels.

The stakeholder table below (Table 1) summarises the main actors relevant to HWF planning in Sweden. For readability, stakeholders are grouped into broad categories. The full stakeholder list is provided in a separate annex (Annex 1) submitted alongside this report.

There is no single national structure responsible for integrated HWF planning across all levels of the system. Instead, planning is carried out within existing structures and through collaboration between actors.

During the HEROES project, Sweden has carried out policy dialogues and collaborative activities involving national authorities, regions, professional organisations and other stakeholders. These activities have focused on specific workforce challenges, including child and adolescent psychiatry, dental care and specialist physician planning.

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The policy dialogues have been used to discuss workforce challenges, exchange perspectives and explore possible actions. In some cases, methods such as backcasting have been applied to support discussions on future workforce needs.

Work within HEROES has also included the development of pilot activities involving collaboration between different actors and levels of the system. These activities form part of the broader work to develop a national learning system for workforce planning.

Overall, governance of workforce planning in Sweden continues to be characterised by a decentralised structure, with multiple actors involved and planning processes carried out at different levels. While national authorities provide data, analyses and strategic support, regions play a central role as healthcare providers, employers and workforce planners.

Table 1. Summary of the main actors relevant to HWF planning in Sweden

Name of the stakeholder (grouped)	Involvement	DATA				SKILLS	
		I	P	I	P	I	P
Academia / universities (grouped)	Already involved	H	L	H	H	H	H
Foundations and research funders (grouped)	Not yet involved	H	L	H	H	H	L
Industry / provider associations (grouped)	Not yet involved	H	L	H	H	H	L
Ministries (grouped)	Already involved	H	L	H	L	H	L
National Board of Health and Welfare (Socialstyrelsen)	Already involved	H	H	H	L	H	L
Other civil society actors (grouped)	Not yet involved	H	L	H	H	H	L
Other governmental agencies (grouped)	Not yet involved	H	H	H	L	M	L
Patient and civil society organisations (grouped)	Already involved	H	L	L	L	H	L
Professional associations (health professions) (grouped)	Already involved	H	L	H	H	H	L
Regions and municipalities (local/regional authorities)	Already involved	H	H	H	H	H	H
Statistics Sweden (SCB)	Already involved	H	H	L	L	H	L
Swedish Association of Local Authorities and Regions (SKR)	Already involved	H	H	H	H	H	H
Swedish Higher Education Authority (UKÄ)	Already involved	H	H	H	L	H	L
Trade unions (grouped)	Not yet involved	H	L	H	H	H	L

I = Interest; P = Power (influence). Levels are reported as High/Medium/Low for Data, Process and Skills.

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

The mapping is intended to support communication, engagement and sustainability planning across levels rather than to define formal decision-making authority.

Within HEROES, this has included coordinating cross-regional pilots and linking learning from practice to national policy dialogue and planning support. Statistics Sweden and Swedish Higher Education Authority contribute by supplying and analysing population, labour market and education data that strengthen the evidence base used in analyses and dialogue. Ministries and other governmental agencies are relevant as policy-setting and funding actors. Academia and professional/social partners contribute perspectives relevant for dissemination, capability development and long-term sustainability of approaches developed within the pilots and learning activities.

The classification logic in the stakeholder table distinguishes actors by (i) their proximity to operational workforce decisions, (ii) their contribution to the national evidence base (data and analysis), and (iii) their role in enabling processes for learning, coordination and capability development. Interest and power vary by domain.

Regions and municipalities typically have the highest direct influence over operational workforce levers, while national actors have stronger roles in data infrastructures, guidance and convening mechanisms. Stakeholders not central in the introduction (e.g., some cross-sectoral agencies and parts of academia) may have more limited direct influence on workforce decisions but can contribute to specific components such as analytical inputs, capability building and dissemination.

Domain 3: HWF planners' capabilities

In Sweden, HWF planning involves a range of stakeholders at national and regional levels. Key actors include the National Board of Health and Welfare, which has a national role in coordination and analysis, and the 21 self-governing regions responsible for health service provision and workforce planning. In addition, several organisations contribute to workforce data and analysis, including Statistics Sweden, the Swedish Higher Education Authority and other actors involved in education and labour market monitoring.

Within this context, workforce planners work in environments that combine analytical, administrative and governance related tasks. Their work includes collecting and interpreting workforce data, analysing labour market developments, supporting regional planning processes and contributing to policy discussions on workforce sustainability. Many planners already have strong expertise in health systems and workforce dynamics. At the same time, the increasing complexity of workforce challenges has highlighted the need to further develop certain skills related to coordination and planning across organisations and sectors.

In the Swedish context, several skills are particularly important for workforce planners. Analytical skills related to workforce data remain central, including the ability to interpret statistical data, understand labour market trends and translate information into insights that can support decision making. Skills related to modelling and forecasting are also relevant, including familiarity with workforce models, scenario discussions and digital tools used in planning. A particular strength of the Swedish system is the ability to combine and analyse data from multiple national registers, enabling detailed workforce and population-based analyses. Rather than relying on a single forecasting model, workforce planning in Sweden is informed by the combined use of national register data, workforce intelligence, labour market analyses and stakeholder engagement processes. This approach supports decision-making and policy development and strengthens long-term workforce sustainability.

Workforce planning also requires skills that support collaboration. These include the ability to facilitate dialogue across organisations; understand how different parts of the system interact and support learning between regions and organisations.

The AS IS report, which describes the situation of workforce planning before the start of the HEROES project, showed that there is a need for a more shared understanding of workforce planning across organisations. It also showed a need for clearer ways of documenting work, reflecting on experiences and sharing knowledge between regions.

In Sweden, workforce planning often takes place within separate organisational structures linked to specific professions or services. This can make coordination more difficult. Addressing current workforce challenges therefore requires approaches that support coordination across organisations and allow experience and knowledge to be shared more effectively.

Rather than identifying gaps in skills, the Swedish approach focuses on strengthening and further developing existing capabilities. This includes improving how data analysis is combined with learning from practice, supporting collaboration between regions and integrating reflection and documentation into regular workforce planning activities.

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

Within the HEROES Joint Action, Sweden has focused on strengthening HWF planners' capabilities through a practice-based learning approach rather than traditional classroom training. Task 3 activities began in autumn 2025 and are continuing into spring 2026.

Instead of delivering a standardised training programme, the activities have been organised through a pilot initiative referred to as the National Learning System. The pilot involved five regional teams: Region Halland, Region Jönköpings län, Region Kronoberg, Region Västerbotten and Folktandvården Östergötland. These pilots tested components of a learning-system model for sustainable workforce planning within real operational contexts.

Each regional pilot included a project lead, a mentor and a follow-up researcher, coordinated nationally by the National Board of Health and Welfare, with methodological support from Leading Health Care. The work is structured around recurring mentorship sessions, national webinars and continuous coordination between actors.

A central feature of the approach is that each region works on its own concrete workforce planning case. The pilots therefore address different but complementary aspects of workforce planning:

- Region Halland focuses on coordination between HR and patient safety functions to improve staff wellbeing, retention and leadership through joint use of data
- Region Jönköping develops decentralised, practice-based learning structures linking simulation, onboarding and continuous professional development
- Region Kronoberg explores information-driven healthcare and AI-based analysis to optimise competence use and strengthen system-level decision-making
- Region Västerbotten builds inter-municipal learning structures for preventive and rural healthcare
- Folktandvården Östergötland examines temporary staff mobility and competence sharing within the public dental system

The learning model is based on mentorship and reciprocal learning between regions. Regular mentorship sessions (typically monthly) provide a structured space for discussing challenges, reflecting on data use and exploring how analytical tools can support decision-making. This approach is complemented by Action Learning Set activities and leadership-oriented learning initiatives carried out in collaboration with international partners.

As the pilots are still ongoing, structural workforce outcomes cannot yet be assessed. However, early observations indicate several process-level developments. These include strengthened cross-regional dialogue, increased engagement among participating regions and early integration of reflection and learning routines into existing planning processes. The mentorship format has also been identified as a manageable way to support continuous learning and local ownership of workforce planning challenges.

The activities highlight a shift from viewing training as a one-time intervention to understanding capability development as an ongoing, embedded process. Continuous documentation and follow-up research are used to connect local learning processes to national-level synthesis and policy dialogue.

Training and learning activities initiated during HEROES are expected to continue beyond the project period. A synthesis report finalised in May 2026, summarised lessons learned and provided input for further development of the National Learning System. The long-term sustainability of these efforts will depend on how mentorship structures, documentation routines and cross-regional learning mechanisms are integrated into existing governance and planning structures.

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In conclusion, the HEROES activities in Sweden have contributed to strengthening planners' capabilities primarily through practice-based, collaborative and context-driven learning. Rather than introducing entirely new competencies, the work has reinforced the ability to connect data, analysis and organisational learning, supporting a more integrated and adaptive approach to HWF planning.

Domain 4: HWF data and models

HWF Data: Sources

HWF data in Sweden are supported by strong national administrative registers and institutional collaboration. The main data suppliers include the National Board of Health and Welfare (Socialstyrelsen), Statistics Sweden (SCB) and the Swedish Higher Education Authority (UKÄ). Supply-side data are derived primarily from national administrative registers covering licensed professions, labour market participation, education and training pathways. Demand-related data include demographic projections and healthcare utilisation data, mainly for specialist care. Supply data are routinely used in HWF analyses and planning support, while demand-related data are primarily used for contextual interpretation and policy dialogue rather than as direct inputs in operational workforce planning models.

Advanced Minimum Data Set: achievements under HEROES

Sweden reviewed the HEROES Advanced Minimum Data Set (AMDS) overview developed within Work Packages 5, 6 and 7 (WP5/WP6/WP7) of the Joint Action HEROES, which focus on strengthening HWF data, tools and planning capacity. The overview was initially completed in 2024.

The review did not result in changes to the AMDS structure or entries. Instead, the exercise contributed to validating the existing overview and strengthening the shared understanding of its content, including strengths, limitations and areas for further development. It also supported more structured interpretation and use of the AMDS in national analyses and policy dialogue.

The AMDS continues to show strong coverage on the supply side, including profession, age, headcount, geographical area, specialisation, country of first qualification and gender, as well as key flows such as retirement and migration.

Data on full-time equivalents (FTE) are included on the supply side but remain uneven across sectors and professions, which limits their systematic use in national workforce planning. HEROES did not result in improved availability or harmonisation of FTE data. Instead, the project contributed to improved validation, analytical use and interpretation of existing data sources, as well as strengthened collaboration between institutions involved in HWF analysis.

On the demand side, population data are included, and healthcare utilisation data are available mainly for specialist care. Remaining limitations include the lack of comprehensive national primary care data and constraints related to utilisation indicators that are largely based on physicians' activities.

During HEROES, the use of qualitative information and methods was strengthened through structured discussions, pilot activities and learning-oriented approaches. Qualitative insights related to care organisation, workforce conditions and labour market dynamics have been used to support interpretation of workforce challenges, including teamwork, task shifting, retention and mobility. These elements complement quantitative data but are not applied as direct inputs in forecasting models.

The reviewed AMDS overview is presented in Table 2.

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		
Head count	X	X	X	X	X		
FTE	X	X	X				
Geographical area	X	X	X	X	X		
Specialisation	X	X	X	X	X		
Country of first qualification	X	X	X	X	X		
Gender	X	X	X	X	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

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

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HWF Data: improvements

The core quantitative data dimensions relevant for HWF planning were already available prior to HEROES. During the project, improvements related to quantitative data primarily concerned enhanced validation, linkage and analytical use of existing information rather than changes in overall data availability or in the structure of the Advanced Minimum Data Set (AMDS).

An important analytical development during HEROES has been the integration and use of population labour market status data (Befolkningens arbetsmarknadsstatus, BAS[33]). This dataset was new to the National Board of Health and Welfare in the context of HEROES and is now used both in commissioned analytical studies and within the National Planning Support (NPS)[34]. The integration of BAS has strengthened the interpretation of workforce participation and mobility without altering the underlying AMDS framework.

HWF Data: HEROES contributions and future directions

Sweden's future work on HWF data builds on the HEROES Action Plan, which outlines the planned national activities and priorities of the Joint Action, and the WP4 Sustainability framework developed to support the long-term sustainability of HWF planning systems.

In this context, Sweden's approach focuses on sustaining learning-based and evidence-informed data use within the existing decentralised governance system. Planned actions include continued collaboration with Statistics Sweden and the Swedish Higher Education Authority, further development of transparent data visualisation and analytical practices, and continued integration of qualitative learning from pilots and policy dialogues to support interpretation and use of workforce data beyond the project period.

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

Sweden does not apply a single, integrated national HWF planning or forecasting model. Instead, workforce planning is supported by a combination of descriptive analyses, commissioned studies, and regional or sector-specific tools developed over time by different authorities. These tools are primarily used to support monitoring, analysis, and policy dialogue rather than to produce binding workforce projections.

Sweden does not currently use a single formal HWF planning model. Instead, workforce planning relies on a combination of analytical approaches and data sources. Existing approaches are mainly based on stock-and-flow analyses using headcount data, complemented by information on education inflows, retirement and labour market mobility. FTE is used to a limited extent and is not harmonized across professions or sectors.

In the Swedish context, demand is not projected through a single quantitative model. Instead, it is explored through demographic projections, healthcare utilization analyses, expert input, and scenario-based discussions.

Gaps between supply and demand are therefore not calculated through a unified model but are assessed using indicators such as reported staffing shortages, vacancy information, waiting times, and service pressures. These indicators inform policy discussions related to education inflow, recruitment challenges, retention strategies, and discussions on skill mix and task shifting.

33 Population by Labour market status

34 Nationella stödet för kompetensförsörjning - Socialstyrelsen

The existing analytical tools are not systematically evaluated as standalone workforce planning models, reflecting their role as analytical and dialogue-supporting instruments rather than formal forecasting systems.

HWF Planning Models: HEROES contribution and future directions

During HEROES, methodological development has focused on strengthening conceptual foundations rather than implementing new operational models. Exploratory work on a capability framework, learning systems and back-casting approaches has been undertaken through regional pilots and national policy dialogues. These activities have tested how qualitative learning from practice can complement existing quantitative analyses.

Future developments focus on continued methodological refinement, cross-regional learning and alignment with national planning structures, in line with the WP4 Sustainability Action Plan and its related project milestones.

Reflecting the HEROES sustainability plan and the policy dialogue processes developed during HEROES, Sweden's future plans for HWF planning focus on sustaining learning-based and evidence-informed approaches within the existing decentralized governance system. Planned actions include continued national coordination, integration of learning and reflection routines into National Board of Health and Welfare's National Planning Support, and further collaboration with key national stakeholders during 2026–2027.

From HEROES to Sustainability for HWF Planning

Sustainability and Policy Impact

The Joint Action HEROES has contributed to strengthening Sweden's long-term approach to HWF planning by supporting closer collaboration between national agencies, regions, higher education institutions and international partners. Through the project, Sweden has further developed its work on workforce intelligence, policy dialogue and learning-based approaches to workforce planning.

A central outcome of the Swedish work has been the development of pilot activities exploring how workforce planning can be integrated with organisational learning, leadership, patient safety and service development. The pilots have also contributed to testing structures for a national learning system for workforce planning coordinated by the National Board of Health and Welfare (Socialstyrelsen).

The project has strengthened collaboration between National Board of Health and Welfare (Socialstyrelsen), Statistics Sweden (SCB) and the Swedish Higher Education Authority (UKÄ), particularly regarding workforce mobility, migration patterns, labour market movements and education pathways. This has contributed to a stronger evidence base for workforce planning and policy discussions at national and regional level.

HEROES has also supported the development of new approaches and methods, including work on the Capability Framework, policy dialogues using back-casting approaches, mentorship structures and collaborative learning activities with WHO Europe and other international partners.

The sustainability work in Sweden focuses on maintaining and further developing the structures, partnerships and learning processes established during the Joint Action. This includes continued collaboration between national and regional actors, integration of learning structures into future planning support, and further development of a national learning system for sustainable workforce planning.

Overall, the HEROES project has contributed to increased system collaboration, improved use of workforce intelligence, strengthened policy dialogue and greater focus on learning and systems thinking as part of long-term workforce planning in Sweden.

ANNEX 1. STAKEHOLDER LIST

Name of the stakeholder	Type of stakeholder	Involvement in the HWF planning process	Data		Process and tools		Skills	
			I	P	I	P	I	P
Ministry of Finance	Ministry	Already involved	H	L	H	L	H	L
Ministry of Health and Social Affairs	Ministry	Already involved	H	L	H	L	H	L
Ministry of Education and Research	Ministry	Already involved	H	L	H	L	H	L
Ministry of Climate and Enterprise	Ministry		H	L	H	L	H	L
National Board of Health and Welfare	Governmental Agency	Already involved	H	H	H	L	H	L
Swedish Innovation Agency	Governmental Agency	Not yet involved	H	H	H	L	H	L
Social Insurance System	Governmental Agency	Not yet involved	H	H	H	L	H	L
The Swedish Agency for Health and Care Services	Governmental Agency	Not yet involved	H	L	H	L	H	L
The Public Agency of Sweden	Governmental Agency	Not yet involved	H	L	H	L	L	L
Swedish Higher Education Authority	Governmental Agency	Already involved	H	H	H	L	H	L
Statistics Sweden	Governmental Agency	Already involved	H	H	L	L	H	L
Karolinska Institutet	Academia	Not yet involved	H	L	H	H	H	H
Lunds university	Academia	Not yet involved	H	L	H	H	H	H
Uppsala university	Academia	Not yet involved	H	L	H	H	H	H
Göteborgs university	Academia	Not yet involved	H	L	H	H	H	H
Linköpings university	Academia	Not yet involved	H	L	H	H	H	H
Umeå university	Academia	Not yet involved	H	L	H	H	H	H
Örebro university	Academia	Not yet involved	H	L	H	H	H	H
The Swedish Association of Local Authorities and Regions	Society	Not yet involved	H	H	H	H	H	H
Stockholm County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Uppsala County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Ötergötaland County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Jönköping County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Kronoberg County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Kalmar County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Gotland County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Blekinge County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Skåne County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Halland County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Västra Götaland County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Värmland County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Örebro County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Västamanland County	Local / Regional Authority	Already involved	H	H	H	H	H	H

Name of the stakeholder	Type of stakeholder	Involvement in the HWF planning process	Data		Process and tools		Skills	
			I	P	I	P	I	P
Dalarna County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Gävleborg County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Västernorrland County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Jämtland County	Local / Regional Authority	Already involved	H	H	H	H	H	H
Västerbotten County	Local / Regional Authority	Already involved	H	H	H	H	H	H
290 municipalities	Local / Regional Authority	Already involved	H	H	H	H	H	H
The Swedish Pharmacy Association	Society	Not yet involved	H	L	H	H	H	L
The Swedish Associatoin of Occupational Therapists	Society	Not yet involved	H	L	H	H	H	L
The Swedish Confederation of Professional Associations (SACO) SRAT	Society	Not yet involved	H	L	H	H	H	L
The Swedish Association of Professional Scientists	Society	Not yet involved	H	L	H	H	H	L
The Swedish Association of Dietitians	Society	Not yet involved	H	L	H	H	H	L
The Swedish Association of Physiotherapists	Society	Not yet involved	H	L	H	H	H	L
The Chiropractic Association in Sweden	Society	Not yet involved	H	L	H	H	H	L
The Swedish Association of Speech Therapists	Society	Not yet involved	H	L	H	H	H	L
The Swedish Junior Doctor's Associartion	Society	Not yet involved	H	L	H	H	H	L
The Swedish Naprapathic Association	Society	Not yet involved	H	L	H	H	H	L
The Swedish Opticians Association	Society	Not yet involved	H	L	H	H	H	L
The Orthopedic Industry Council	Society	Not yet involved	H	L	H	H	H	L
The Sweidsh Psychological Association	Society	Not yet involved	H	L	H	H	H	L
The Swedish Nurses' Association	Society	Not yet involved	H	L	H	H	H	L
The Swedish Association of Graduate Professionals in Social Work, Social Care and Behavioral Science	Society	Not yet involved	H	L	H	H	H	L
The Swedish Medical Association	Society	Not yet involved	H	L	H	H	H	L
The Swedish Dental Hygienists' Association	Society	Not yet involved	H	L	H	H	H	L
The Swedish Dental Association	Society	Not yet involved	H	L	H	H	H	L
The Swedish Association of Health Professionals	Society	Not yet involved	H	L	H	H	H	L
Swedish Medical Society	Society	Not yet involved	H	L	H	H	H	L
The Association of Swedish Engineering Professionals	Society	Not yet involved	H	L	H	H	H	L
The Diabetes Association	Society	Not yet involved	H	L	L	L	H	L
The National Association for Attentioin Deficit Hyperactivity Disorder	Society	Not yet involved	H	L	L	L	H	L
The Swedish Rheumatism Association	Society	Not yet involved	H	L	L	L	H	L

Name of the stakeholder	Type of stakeholder	Involvement in the HWF planning process	Data		Process and tools		Skills	
			I	P	I	P	I	P
The Asthma and Allergy Association	Society	Not yet involved	H	L	L	L	H	L
The Swedish Autism and Asperger Association	Society	Not yet involved	H	L	L	L	H	L
The Swedish Assocationa for Digestive Diseases	Society	Not yet involved	H	L	L	L	H	L
Neuro - association focusing on neurology	Society	Not yet involved	H	L	L	L	H	L
National Heart and Lung Federation	Society	Not yet involved	H	L	L	L	H	L
Network Against Cancer	Society	Not yet involved	H	L	L	L	H	L
The Cancer Foundation	Society	Not yet involved	H	L	H	H	H	L
The Childhood Cancer Foundation	Society	Not yet involved	H	L	H	H	H	L
The Heart-Lung Foundation	Society	Not yet involved	H	L	H	H	H	L
The Diabetes Foundation	Society	Not yet involved	H	L	H	H	H	L
The Alzheimer's Foundation	Society	Not yet involved	H	L	H	H	H	L
The Crown Princess Victoria's Foundation	Society	Not yet involved	H	L	H	H	H	L
The Brain Foundation	Society	Not yet involved	H	L	H	H	H	L
The Queen Silvia's Children's and Youth Hospital Foundation	Society	Not yet involved	H	L	H	H	H	L
The Vårdal Foundation	Society	Not yet involved	H	L	H	H	H	L
The Pink Ribbon Foundation	Society	Not yet involved	H	L	H	H	H	L
The Knut and Alice Wallenberg Foundation	Society	Not yet involved	H	L	H	H	H	L
The Swedish Foundation for Humanities and Social Sciences	Society	Not yet involved	H	L	H	H	H	L
The Swedish Research Council	Governmental Agency	Not yet involved	L	H	L	H	L	H
Swedish Reserach Council for Health, Working Life and Welfare	Governmental Agency	Not yet involved	L	H	L	H	L	H

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D5.1 Report on countries' data collection, HWF planning models and tools, planning skills improvement and stakeholders' involvement: Greece, Ireland, Italy, Norway, Portugal, Spain and Sweden

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