EHMA
European Health Management Association

Health First Europe

EU Health Policy Platform

Report of the EU Health Policy Platform Stakeholder Network on 'Profiling and Training the Healthcare Workforce of the Future'

ESSENTIAL SKILLS FOR A RESILIENT AND EFFECTIVE EUROPEAN HEALTH WORKFORCE

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University of South Eastern Norway
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Executive Summary

The ultimate purpose of this report is to **trigger change** on the ground both at national and regional levels across Europe by raising awareness of the existing and foreseeable skills gaps of the European health workforce in the context of evident trends and challenges.

Appropriately qualified and skilled healthcare professionals are key to building and strengthening resilient health systems that are able to react to and cope with 21st century challenges such as the green and digital transition, workforce shortages, ageing societies, and a raising number of non-communicable diseases. The health workforce also plays an important role in contributing to the p**reparedness and response to emergencies**, such as governments' response to the COVID-19 pandemic, and disasters, in particular through participation in national health emergency management systems, **local leadership** and the **provision of health services**.

Health First Europe (HFE) and the European Health Management Association (EHMA) are two Brussels-based non-profit associations actively working to improve European healthcare for the benefit of European citizens. In 2020, the two organisations joined forces to launch the **EU Health Policy Platform (EU HPP) Thematic Network on '*Profiling and Training the Healthcare Workforce of the Future*'** to gather insights on the main challenges European healthcare professionals face and promote good practices on how to overcome them. This Thematic Network was transformed into a Stakeholder Network in 2021. The Network is composed of numerous healthcare networks and associations. The Network members were consulted and responded with detailed feedback on their priorities concerning essential skills for all healthcare professionals, with a specific focus on those professionals represented by the network members.

This paper is based on the exchanges and discussions conducted with the Stakeholder Network members and presents the current and future skills needs of the health workforce which these Network members identified as essential. It also outlines ideas and underlying upskilling and reskilling activities that can be implemented to equip the health workforce for better patient participation across the European Union by 2030.

Following a comprehensive literature review related to workforce skills and an overview of the methodology of the EU HPP Stakeholder Network consultation, the paper outlines four areas of skills the future workforce should be equipped with to deliver better, more resilient, sustainable and effective patient-centred care. These areas are:

1. Digital, eHealth and AI skills;
2. Patient-centred communication skills;
3. Interdisciplinary and coordination skills; and
4. Green skills

Based on the inputs of the members of the Stakeholder Network, HFE and EHMA produced a set of concrete, actionable recommendations addressed to policy makers at various levels. These recommendations highlight how the healthcare workforce can best be supported to acquire essential skills needed to cope with the main healthcare challenges of the 21st century. These include:

DIGITAL SKILLS: Up-scale and effectively **integrate digital competencies, including eHealth** and **mHealth**, into health professionals' **education** and **training programmes**, as well as through lifelong learning, continuing professional development, staff exchange programmes, and pre-certification of medical societies. These programmes should include courses on big data processes and AI applications, and digital modules about the **benefits of digital health tools. Pan-European digital academies** should also be offered to clinicians. Promote regulatory skills for healthcare professionals to achieve better and safer care outcomes.

COMMUNICATIONS SKILLS: Incorporate **effective** and **patient-centred communication** in training programmes as well as in academic curricula across Europe including skills to nurture patient engagement. Focus on communication capacity with vulnerable groups and older persons.

INTERDISCIPLINARY AND COLLABORATION SKILLS: **Assess and address the needs of educators** delivering interdisciplinary and collaboration skills development as a foundation for enhancing this complex competency. **Focus on adaptability** in healthcare professionals' education programmes. Provide possibilities for **interdisciplinary education** and certified training on **inter-disciplinary management skills**. Foster collaboration between healthcare professionals, technicians, including digital and environmental experts and administrative staff. **Introduce simulation training** methodologies which can be particularly useful and efficient to experiment interprofessional and interdisciplinary teamwork. Embrace the 'one health' approach in education.

GREEN SKILLS: Promote existing good practices and raise awareness of what green and sustainability skills mean and what new job positions will be needed. Enhance climate literacy and climate health literacy.

Any concrete actions around these four areas should be preceded by a large-scale and comprehensive **data collection** about health workforce skills needs allowing accurate planning and analysis. Two conditions have been emphasised around the recommended actions: a consistent overall approach and long-term sustainability. A **strategy** would be instrumental to ensure that the recommended actions do not remain isolated measures, but are implemented consistently over time. In order to secure **long-term sustainability** for the upskilling and reskilling actions, it is not only the healthcare professionals but also their educators who should be upskilled and reskilled and the educational and training institutions should be equipped with the necessary infrastructure and knowledge so that they can provide courses and training sessions continuously over time addressing large audiences in a tailored manner. It applies to all skills mentioned above but particularly to complex skills such as interprofessional and interdisciplinary teamwork.

Last but not least of all, top-down measures such as education reforms and prioritisation of health workforce skills development on the political agenda should be combined with a continuous engagement of healthcare professionals in monitoring and evaluating their performance and eventually developing training materials.

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1. Literature review

This literature review provides an overview of the current and future challenges of the health workforce. It intends to answer the following research questions:

➢ What is the European policy context of shaping future health workforce skills?
➢ Are there enough large-scale, comprehensive data at European level about health workforce skills needs?
➢ What are the 21st century challenges, trends/targets identified impacting the health and care sector?
➢ What skills are essential for the health workforce to successfully overcome these challenges and follow the new trends?
➢ Are there good practices collected and shared on upskilling and reskilling health workforce? Are there recommendations drawn from these practices?

This desk research complements the consultation carried out in the framework of the European Health Policy Platform Stakeholder Network on 'Profiling and Training the Healthcare Workforce of the Future'. It aims to verify to what extent the relevant available scientific literature and the networks' experience and policy positions are convergent.

1.1. Methodology

To access and gather information for this literature review, different databases, online libraries, publications and websites were used: namely, Science Direct, PubMed, Google Scholar, and European Commission, World Health Organisation (WHO) and the European Observatory on Health Systems and Policies websites. The following keywords have been used to filter the most relevant sources from the existing pool of information: skill mix, health workforce, future skills, skills innovation, skills challenges, reskilling and upskilling, lifelong learning, continuing professional development.

Only papers published in English between 2010 and 2022 that include one or more keywords of the search criteria and provide answers to the research questions were considered. These search criteria resulted altogether in 81 sources that were collected and consulted.

To commence the overview of literature sources, the foundations are established by defining health workforce, skill mix and lifelong learning/continuing professional development. Secondly, the review presents the state of play of education and training in the health and care sector. Then the analysis describes the main challenges encountered by the health workforce. Answers to the research questions above are discussed in detail in chapter 1.4 **Results and responses to the research questions**. Finally, the literature review is concluded with a summary, main messages and research gaps to consider for further research and policy recommendations.

1.2. Definitions

To fully understand the challenges and the skills needs of the future health workforce, three definitions are essential: (i) health workforce, (ii) skill mix and (iii) lifelong learning and continuing professional development.

1.2.1. Health workforce

It is important to adopt a broad and inclusive definition of 'health workforce' that covers all professionals in the health services, public health and related areas, and workers who provide support to these activities.

According to the European Action Plan for Strengthening Public Health Capacities and Services [1], the health workforce has three distinct categories – (i) **non-health sector professionals**, which mainly encompasses actors from different fields whose decisions and actions affect health either implicitly or explicitly, including actors such as lawyers at different levels of governments; (ii) **health and social care professionals**, which consists of the wider health workforce and includes individuals who work in the health or social sectors and are implicitly connected to public health; and (iii) **public health professionals**, which comprises the foundation of the public health workforce and which need health skills and competences to perform their duties efficiently [2]. All people, e.g. practitioners, nurses, pharmacists, involved in acts and actions to enhance health belong to the health workforce.

1.2.2. Skill-mix

Individual professionals and workforce teams in all fields of profession are equipped with **specialised knowledge** and skills to perform their duties. Skill mix is the combination or grouping of different categories of professionals that is employed in any field of work [3], [4].

In the context of healthcare provision, it can be applied to **macro** (regional or national), **meso** (organisational, local) and **micro** (team, individual) levels. In this sense, it can mean a combination of skills available at a specific time in a country, region (macro level); a mix of posts in a given facility (meso level); or a mix of employees in a post or mix of skills between occupational groups such as physicians and nurses; or very specific specialisation within public health such as specialised nurses and pharmacists (micro level) [1],[4].

In order for the health workforce to perform their duties well, two conditions are essential: (i) recognition of the challenges they face and (ii) enhancement of their skill mix.

Education and training systems should shift their attention to the **dynamically changing skills needs** and develop new skills-mix that can mitigate skills mismatches.

1.2.3. Lifelong learning and continuing professional development

Lifelong learning (LLL) covers the learning and living activities pursued by individuals of all ages through a variety of modalities that, together, fulfil a set of learning needs and demands to successfully cope with social and economic challenges and support sustainable practices [5]. Continuing professional development (CPD) is a commitment to lifelong learning to enhance individual abilities. It includes formal, non-formal and informal education. CPD is a broad definition of a learning process which allows the development of professional skills by: a course; an education programme resulting in a certificate or qualification; or acquiring new knowledge within more informal circumstances by exchange of good practices, such as a webinar or a conference [6],[7].

1.3. State of play of education and training in the healthcare sector

Health workforce development is closely associated with education and training. Educating the health professionals can contribute to **preparing** them to respond efficiently to patients' needs and acquire an adequate skills-mix [8]. In cases where **new skills are required, reskilling or upskilling** education procedures can equip health professionals with these skills. Batenburg et al., (2022) [9] highlighted that the link **between training and practice lacks attention**, hence **simulation training** is highly recommended as a training methodology to produce real-life situations which the trainees have to solve by applying the skills they have acquired [10].

A report on 'Skills for the future health workforce' by OECD (2022) [11] revealed that the presence of skills mismatch among health professionals derives from, amongst others, **inadequate education and training**. At system level these high-level challenges can be resolved by **reforming the education and training of health professionals** or **addressing system constraints** that prevent the health workforce from applying those skills [11],[12].

The education and training of health professionals, their licensing and registration, and their continuous education are currently not fully harmonised at EU level. There exist, however, some well-functioning and good practices. Member States which implement for instance Directive 2005/36/EC, [13] mutually and automatically recognise the qualifications of five healthcare professions--dentists, doctors, pharmacists, midwives and nurses responsible for general care—as in their case, the minimum training requirements at EU level are regulated. For professions where the minimum training requirements are not yet harmonised, the composition of training programmes is managed at national and sometimes sub-national level, which consequently limits the **mobility** of those healthcare professionals across borders [14].

As an example, the minimum duration of medical education in Europe and in the European Economic Area is 5 years of university-based training, which is followed by additional training at a hospital and a specialist training. However, the requirements for specialist trainings or residency programmes are determined at a national level. This includes admission, and duration - EU directives set only a minimum duration-, content, structure, and significance of diplomas. To harmonise specialist trainings across the EU, the European Union of Medical Specialists (Union Européenne des Médecins Spécialistes, UEMS) developed guiding principles [15] and a voluntary competence-based framework, but these initiatives are not always recognised by the relevant national authorities.

In the case of nurses, thanks to the European Directive on Mutual Recognition of Professional qualifications (Directive 2013/55/EU) and the **Bologna Process** [16], education is increasingly performed by higher education institutions, although in many countries these programs co-exist with others performed by nursing schools. Specialised training is also available, but providing various titles, taking different number of years, and performed at various levels in most countries [15].

The examples of medical and nursing education are not different from those of other health professions, as their training also varies across countries. The differences are not only between, but also within countries.

The European Commission's efforts go hand in hand with those of the Member States towards harmonising minimum training requirements for healthcare professions where they do not exist yet are opening promising horizons.

While in practice the workforce is expected to collaborate to effectively meet demands, both their initial education and continuing professional development (CPD) are primarily done in silos. The implementation of interprofessional education and competency frameworks is nevertheless crucial to facilitate more integrated and people-centred health services.

Notable **gender inequity** is observed in terms of **accessing training** as well [17]. Women are more likely to face challenges in accessing and completing education and training than male professionals. It is estimated that women count for 70% of the global health and social care workforce, however, the proportion of women accessing education and training at a global level is lower [17]. Well-established skills development structures and processes should be introduced to encourage women to participate in education and training as well as to develop skills to overcome existing barriers in the employment field [17], [18].

The COVID-19 pandemic has exacerbated social inequalities in the healthcare service, occupational risks and stress of healthcare professionals. This calls on the one hand for **enhanced competencies to better cope with stress** and on the other hand policies and approaches which **pay more attention to the person** behind every healthcare professional and prevent occupational risks, stress and burn-out.

During the **COVID-19 pandemic**, countries expressed the need to assure adequate numbers of skill mixed health professionals in combination with developing their competences to respond to their work tasks [19]. Additionally, the pandemic has also raised questions whether the health workforce is prepared for future challenges or whether health professionals have the competences to perform under these challenges [20].

In order to address the challenges caused by COVID-19, additional training and competency development activities were implemented for managers, new health professionals, health workforce who were being deployed to other roles, and returning (inactive or retired) health professionals [21]. Those included training on:

- using Personal Protective Equipment (PPE);
- COVID-19 treatment, management and safety measures;
- training programmes for storing, delivering and administering vaccines;
- remote consultations and the use of electronic health records;
- the management of patients with acute respiratory failure;
- enabling health professionals to work in different healthcare settings;
- management of general psychosocial skills [20].

Among these urgent training needs to manage the pandemic, Czabanowska and Kuhlmann (2021) [20] identified five critical competency areas that are necessary for the workforce to manage future public health emergencies: (1) flexibility, adaptation, motivation and communication, (2) research, analytical reasoning and sensitivity, ethics, respect to diversity, (3) epidemiology, (4) preparedness, and (5) employability.

COVID-19 has affected workflows and required a push towards **digitalisation** to provide services remotely. This shift required the workforce to develop **technical competencies** to use digital tools for online working and tele-health, which also required them to demonstrate **innovation skills** by being curious, agile, and open to learning by exploring and by doing. They also had to be more **flexible** and practice more **empathy** [20].

Health professionals and leaders had to demonstrate more **open and transparent communication**, not only amongst themselves to better collaborate, but also with the public, including emergency and risk communications. Another need that arose during the pandemic was **well-being skills** for health professionals to preserve their own mental and physical health [22].

The need to strengthen **research skills** and **analytical reasoning** to use evidence-based solutions also became apparent, as did being able to combine them with empathy (sensitivity to social inequities; respect of diversity, ethical knowledge) to effectively address the health needs of the population [23]. **Epidemiological** competency was also needed to manage the pandemic and coordinate containment measures. Moreover, the COVID-19 pandemic highlighted and even intensified pre-existing social, gender and health inequities within and among countries. These growing inequities require **addressing social determinants of health** as an integral part of national and regional policies aiming to respond to health and socioeconomic crises and emergencies [23].

1.4. Results and responses to the research questions

Findings are presented in the order of the research questions as listed in chapter 1. **Literature review:**

➢ European policy context
➢ Data availability about skills needs
➢ Challenges encountered by the health workforce in the 21st century
➢ Essential skills to face 21st century challenges

1.4.1. European policy context

The rapid shift towards a climate-neutral Europe and the digital transformation has an impact on the way we work, learn, and lead our lives. With the right skills, people can make economies more competitive and can drive innovation. However, skills gaps and mismatches are increasing. People work in jobs that they are not qualified for while 40% of European employers have faced difficulties in finding qualified personnel [19]. As a result, in 2016, the European Commission expressed its interest in supporting the upskilling and reskilling of the workforce and presented a European skills agenda [24] to tackle existing skills challenges.

In 2020, building on the European Digital Strategy [25], the Industrial and Small and Medium Enterprise Strategy [26], the Recovery Plan for Europe [27], increased support for youth employment [28], the European Green Deal [29], the European Pillar of Social Rights [30], and the lessons learnt during the COVID-19 pandemic, the European Commission developed a new **European Skills Agenda** [24], which includes 4 building blocks:

1. a call for sectoral stakeholders to collaborate on a joint action by creating a Pact for Skills Alliance [31];
2. ensuring that people, including the workforce, have the right skills for their jobs;
3. supporting people in their lifelong learning pathways; and
4. facilitating Member States' and private investments in skills.

Across its different initiatives (not including the Recovery and Resilience Facility), the Commission has announced plans to invest 85 billion euros in skills across all sectors [32] (See figure 1).

The primary objectives of the European Skills Agenda are that individuals should be able to use a full range of their skills to execute their daily working duties and to cope with situations that go beyond the formal education and training system24.

In addition, the 2022 EU4Health work programme [32] is investing 29 million euros in the training of the health workforce. The key skills highlighted by the European Commission are those required to support the **digital and green transitions**.

These policy documents, hand in hand with the funding instruments, give orientation and support for Member States and stakeholders working in collaboration to identify and develop specific skills and competencies needed for the health workforce in an era of the twin transition.

1.4.2. Data availability about skills needs

The health workforce represents a significant share of the European workforce. The latest figures by Eurostat [33] (from 2019) have identified almost **15 million people** who work in healthcare occupations, representing over 7% of all persons employed and almost 4% of the EU population. These numbers include medical doctors (1.9 million), nurses and midwives as well as their assistants (4.5 million), personal care-givers (4.1 million), and other health professionals and their associates (4.1 million). The majority of those health professionals are women (78%).

EU investment in skills

Programme	Investment (in billions of euros)*
European Social Fund Plus (ESF+)	61.5
Erasmus	16.2
InvestEU	4.9
European Globalisation Adjustment Fund	1.1
European Solidarity Corps	0.8
Digital Europe	0.5

**Resources from the Recovery and Resilience Facility specifically for skills investment cannot yet be estimated*

Figure 1. Investment in skills earmarked in different European programmes

Among EU Member States, Sweden has the highest share of health professionals (12% of the employed), followed by Finland and Denmark (both 10%) while Cyprus, Poland, Latvia, Romania, Luxembourg, Bulgaria, Hungary and Slovenia have the lowest shares, with the health workforce representing around 4% of the employed.

The figures above show that it is relatively easy to find statistics about the number of health professionals per country, at European, or even at global level. However, **extensive up-to-date research about the skills needs of the health workforce has not been conducted.**

Reliable data about needs would be the first step towards successful health workforce and labour market **planning**, **analysis** and **strategies** to address the challenges which are also detailed below [34].

Individual initiatives led by research institutes e.g., the Health Workforce Institute [35], EU-funded projects and tenders, e.g., Joint Action on Health Workforce Planning and Forecasting (2013-2016) [36] and its continuation, Heroes as of late 2022, BeWell – Blueprint Alliance for a Future Health Workforce Strategy on Digital and Green Skills (Erasmus+)– led by EHMA [37], EUVECA – European Platform for Vocational Excellence in Health Care (Erasmus+) – Region of South Denmark [38], instruments, e.g: ECVET- European credit system for vocational education and training (CEDEFOP) [39] attempted and still attempt to capture and draw the map of health workforce needs but a **large-scale, current, and comprehensive collection of data** would be essential to take efficient further steps in resolving skills issues in the health and care sector.

In an endeavour to encourage activities in health workforce planning, the European Commission established the 'Support for the health workforce planning and forecasting expert network' (**SEPEN**) [40] that aims to share expertise and knowledge on enhancing health workforce by developing a network, mapping health workforce policies in all EU countries, providing support to the health workforce planning and publishing and documenting the above actions [41].

1.4.3. Challenges encountered by the health workforce in the 21st century

While health and care systems in a broader sense are threatened by a large number of challenges, health professionals themselves are impacted by gender inequities and undoubtedly gender-based discrimination prevails in the sector just like in many other sectors, in this chapter only those challenges are listed and analysed that are closely related to skills, training and education. The exercise of listing and individually assessing these challenges appears complex as they are all strongly interrelated.

Demographic change, its related diseases and NCDs – increased demand

Demographic changes and the rising number of people living with **chronic conditions** and/or **multimorbidities**, the **burden of non-communicable diseases – NCDs** (cardiovascular diseases, cancer, etc), and the consequences of our sedentary lifestyles have created pressures on health systems and increased the demand for skilled health workforce. The increasing demand for health services is not yet compensated with an equal increase in physicians and other professionals [42],[43].

As a result of global trends such as globalisation, migration, and ageing, improving access to equitable care requires further attention and sensitivity towards new population groups and their specific needs. A possible solution is the development of **diversity competencies**. Diversity competency is defined by Doričić et al. (2021) [44] as "an approach for improving access to healthcare for members of minority groups. It includes a commitment to institutional policies and practices aimed at the improvement of the relationship between patients and healthcare professionals." This definition goes beyond cultural differences to also include a broader definition of minority groups, including ethnic and religious minorities, individuals with different gender identities, as well as those with non-heteronormative sexual orientation. Doričić et al. (2021) [44] has observed that many organisational procedures **do not address specific needs of minority groups**, nor include diversity training programmes for their staff. This has become a crucial need as disparities in healthcare access for these groups are increasing their disadvantages.

In Europe, 80% of the disease burden is associated with cardiovascular diseases, diabetes, mental health problems or cancer and heart disease and cancer are the leading causes of avoidable premature deaths [40]. In The Netherlands, 88.23% of deaths are caused by non-communicable diseases, while in Switzerland a survey found that 31.9% of the population above the age of 15 are affected by at least one chronic disease [42], [45]. The high prevalence of chronic diseases and multimorbidity has created a higher healthcare burden for countries. In the case of Switzerland, NCDs were responsible for 80% of the total expenses of the health system [41].

Workforce shortages - shrinking supply

The **health workforce is central to health system performance** and to population health [46]. The previously mentioned challenges of demographic change and an ageing population equally apply to those people who provide care formally or informally within the walls of a hospital our outside.

The health workforce themselves is ageing and recruitment and retention have become a huge challenge in the EU and Europe. All countries in the EU and Europe suffer from health workforce shortages [46]. Already before COVID-19, some European countries experienced shortages of doctors, nurses, clinicians and other healthcare professionals and others faced increased burn-out of healthcare professionals due to the heavy workload, which exacerbated the employment gap [12],[47]. One could expect that the number of health professionals would have grown substantially due to the increased care demand created by the COVID-19 pandemic, but that was not necessarily the case.

Meeting the demand that the ageing population, NCDs and chronic diseases put on primary care requires an overall strengthening of this care setting, which naturally leads to skill mix innovation. Traditional primary care models are becoming less able to manage the work intensity and complexity, especially when countries are facing General Practitioner (GP) shortages [12]. **Adopting the skill mix in primary care is considered key to tackling health workforce shortages and enhancing working conditions** [9].The Swiss Health Observatory has projected that the number of GPs will need to increase by up to 40% by 2030 compared with the 2004 level [42] in order to deal with the increasing healthcare demand.

England produced a good practice on how to overcome GP, nurse and support staff shortages in primary care as well as a mismatch between demand and competences. The NHS has experienced a fragmentation in recruiting new nurses and an increased number of nurse vacancies [8],[47]. In addition, the increased workload created by the COVID-19 pandemic put additional pressure on GPs and nurses. As a result, a new generation of GPs have expressed their preferences for better work/life balance such as early retirement or reduced time of engagement. To respond to these long-term trends in healthcare supply and demand, two strategies were established. Firstly, policy makers pushed for an **increase in recruiting GPs** and **enhancing retention and workforce planning**; and secondly, **new non-medical roles** have been proposed.

Addressing workforce shortages in this manner resulted in an increase in the number of professionals and a better delivery of care in England [8].

Digital transformation

According to the Digital Economy and Society Index (DESI), **four out of ten adults and every third person who works in Europe lacks basic digital skills** [48]. The European Commission (EC) has expressed its determination to mitigate the digital skills gap and promote strategies to enhance the level of digital skills in Europe. The European Digital Strategy [48] is one example of initiatives implemented by the EC to address the digital skills gap. Digital technologies in healthcare provide new opportunities to the health workforce by enhancing internal and external processes and managing large amounts of medical information. Therefore, the digital revolution in healthcare can create new opportunities and yield new business models to address issues in medical practice [49]. Digital technologies are deployed more and more often, in a growing number of fields and by an increasing number of users. New digital technologies undeniably contribute to improved quality of service delivery, patients' safety and reduced costs [50],[51]. One example of breakthrough digitalised processes is medication management, which allows significantly higher patient safety, better care outcomes, increased worker satisfaction and more precise medication ordering. Digital medication management also contributes to greener pharmacies by preventing unnecessary overstocking and thus excessive disposal arising from expired medications thanks to, for instance, computerised provider order entry (CPOE) [52].

Digital transformation can also influence the sustainability of organisations. AI, machine learning and growing innovations are key components of the digital transformation [51].

Environmental expectations

In 2019 the European Commission presented the **European Green Deal** [29]. This strategy aims to transform Europe to be the world's first climate neutral continent by 2050, and covers five fields of the economy: transport, energy, agriculture, buildings and industries. Reskilling programmes and new employment opportunities are some of the actions to ensure citizens' transition towards climate-neutral behaviours [29]. The European Green Deal is a roadmap for transforming the EU into an efficient and sustainable continent and offers opportunities to improve public health [29].The European Green Deal aims to improve the well-being and health of individuals by ensuring energy efficient buildings such as hospitals, creating new future-proof jobs and health professions, providing green skills training, as well as ensuring access to healthy and affordable food.

The incidence of chronic diseases has increased over the past decades and has been associated with an increase in chemical production [53]. In an effort to tackle this issue, the **Chemical Strategy for Sustainability** was established under the European Green Deal to take actions towards the reduction of hazardous chemicals in products and combination effect of different chemicals. Other priorities of the Chemical Strategy for Sustainability are to support the prevention of cancer and the supply of safe and affordable medicines [53].

Environmental sustainability in health systems differs from that in other organisations. Environmental sustainability should emphasise actions to reinforce health system functions [53]. Health systems in Europe have been taking measures to mitigate environmental impacts and recognise the relation between health and environmental sustainability.

In Europe, policies such as the **2030 Agenda for Sustainable Development**, which underpins the responsibility of every sector to contribute to Sustainable Development Goals (SDGs), the Health 2020 policy framework agreed by all 53 Members States of the region, and calls for promoting local services for the environment and health, have been launched in an effort to highlight the importance of health systems' sustainability [54].

Changing healthcare professional-patient relation

Despite reduced financial resources and austerity measures, health systems are expected to continuously deliver **high-quality care** [9]. This happens in a context where the relation between healthcare professionals and patients is changing, and where patients are becoming more and more empowered 'managers' of their own conditions. This is enabled by a wide variety of digital health tools, wearables, and other monitoring equipment that collects data and shares it with healthcare professionals. To succeed, many countries are shifting **from specialist-centred care delivery to value-based and patient-centred approaches** [55]. The shift to a people-based approach puts health professionals at the **epicentre of change**. A patient-participation approach requires close collaboration between patients and health professionals in all steps of their care decision-making [43]. This shared decision-making contributes to ensuring that patients receive quality care and essential information about their health conditions and status. The movement towards integrated care and patient participation brings together **different groups of health professionals** to cooperate and develop **collaborative models of care value**.

1.4.4. Essential skills to face 21st century challenges

The health workforce plays a key role in enhancing health and worldwide the demand for health professionals is expected to double. Therefore, the health labour market approach is a foundation for building efficient health labour market policies that address the health workforce challenges and respond to the high demand for health professionals [56].

The establishment of appropriate skill sets and skill mixes are indispensable prerequisites to asserting that people in the health workforce possess the required competencies to respond to demographic changes, workforce shortages, digital and green transitions, and changing healthcare professional-patient relations [57].

The health workforce is the protagonist of health systems. A strong and skilled health workforce requires **mapping** the **provision of skills** adjusted to population needs [49].

An essential condition to improving the skills of the health workforce is that the learning opportunities provided to health professionals should be aligned with their needs and facilitate their entering and staying in the health and care sector labour market with a high level of performance.

It is quite difficult to present digital skills and soft skills as two separate essential skill sets, as in many aspects they are very strongly linked and complementary to each other [10]. It warrants repeating that as **digital transformation** is a major challenge for the health workforce, their reskilling and upskilling should not only be focussed on acquiring IT and data collection/data analysis and related skills sets [58]. Soft skills (such as communication) are equally essential for a shift towards more person-centred and personalised care, which are gaining terrain in the context of the changing healthcare professional-patient relationship and turning from disease-centred to person-centred approaches in screening, diagnosis and treatment. In addition, digital transformation should happen in a way that respects natural resources and the climate [59]. Upskilling and reskilling can and should be considered assets that make a sector very appealing to job seekers and career starters. Continuous learning and training opportunities can attract new professionals who seek new occupational challenges and career opportunities.

Digital skills

Research has shown that health professionals need appropriate training to use various forms of information technology to execute some of their daily tasks.

A report on 'Empowering the health workforce to make the most of the digital revolution' by the OECD [55] revealed that between 30% and 70% of health staff report a **lack of skills** to use digital technologies and engage with digital information. Efforts to support the **digital upskilling** of the health workforce should ensure that adequate training is provided to all health professionals [55].

Digital health is frequently available as an optional course in education and training programmes. As a result, further actions are necessary to make digital health core elements of education and training to meet the demand for **digital upskilling of the health workforce** [55].

Health workforce training should incorporate aspects of digitalisation, such as **raising awareness of eHealth** and developing self-reporting **skills assessment tools** to enhance their IT performance and competences. However, not many tools have been developed so far to **assess health system awareness and skill sets for ICT** [50]. **Assessment tools for digital skills** need improvement.

The **gap between curriculum and eHealth** creates a barrier to the use of new technologies10. Digital skills trainings not only improve the ability to use digital tools but also contribute to **fostering a positive attitude towards innovative digital technologies**. Training the health workforce to enhance their IT skills can equip them with competences to engage in introducing, designing and deploying innovative eHealth solutions.

Improving learning tools and procedures can equip health professionals with better IT skills [9], [10]. Organisations have to ensure that all technologies implemented are **understandable** to the health workforce and **adequate support** is **provided** on how to employ them.

Reliable data about needs would be the first step towards successful health workforce and labour market planning, analysis and strategies to address the challenges which are also detailed below [34].

Soft skills

The health workforce is an integral part of the health system. Adopting a patient participation approach to health system reform depends on the ability to mobilise competent health staff. The transition to patient participation in decisions about the care they receive requires health professionals to have **problem solving skills** that enable them to cooperate with other health staff members when treating a patient [58],[60]. Konstantinidis et al. (2022) [58] found that training in **soft skills has been challenging for students**. Additionally, **digital soft skills** such as collaboration, critical thinking and productivity, are as challenging as technical knowledge about the technologies themselves. **Collaboration** and **problem solving** are essential dimensions to preparing health professionals to **operate as multidisciplinary teams** and adopt soft skills and **collaborative thinking** [12].

In order to achieve the United Nation's health-related Sustainability Development Goals (SDG) by 2030, the WHO Panel of SDG recommends that Member States should adopt a health-in-all-policies approach in order to improve population health and reduce health inequities. Such a task will require a multidisciplinary and interprofessional approach of healthcare personnel trained and acting under a new mindset [61].

Green skills

As explained in the section Environmental expectations, the environmental objectives of the Green Deal also impact the health and care sector. The growing demand for green skills reflects equally growing global concerns on the impact of unsustainable activities in the work place [62]--in the case of the health and care sector, that means in hospitals and formal healthcare institutions. .

Green skills include sustainability, innovation, operation, management, communications, planning, and research skills are needed to support a sustainable society [63]. For instance, in the United Kingdom, the Green Jobs Taskforce published a report mentioning the creation of 2 million jobs by 2030 [64] to support the climate-neutral and global environmental sustainability objectives and achieve zero emission hospitals.

However, **public understanding of green jobs remains limited**. Developing a sustainable health workforce starts with understanding **what green skills are** and expanding those new skills to deal with the level of change required to cover every aspect of delivering care. Establishing sustainability skills requires that the green transition objectives and targets should be embedded in every aspect of the health system starting from health economics processes to the assessment of capital spending [62],[63]. To successfully move towards greener practices in the health sector, health professionals will need to work closely together with experts from other disciplines such as procurement, logistics, and disposal of medical equipment and medicines, thus highlighting once again the importance of collaboration and multidisciplinarity.

1.4.5. Good practices and recommendations for performance improvement

Performance improvement is a process to strengthen a health workforce's competencies [60]. Below, some good practices and recommendations are listed touching upon the role of policy makers, the involvement of the health workforce themselves and how monitoring and giving feedback can be motivating in learning new skills.

Top-down and bottom-up solutions: from policy-making to participatory approaches

Policy makers play a primary role in taking action to mitigate skills mismatches and promote a robust skill mix. Li et al. (2017) [59] highlighted that the establishment of mechanisms to prioritise the demand for a skilled healthcare workforce is of high importance to increasing health systems' performance. Therefore, it is in the hands of policy makers to determine and prioritise the need for action. Measures include but are not limited to reforming education and training arrangements of the health workforce or focusing on addressing system limitations that prevent health professionals from performing at the highest level [55].

Health professionals should be able to take advantage of their skills and use them effectively to deliver care with their patients participating in decision making. A **health system approach is needed to transform the education system** and offer the health workforce adequate levels of training in order for them to be capable of responding to any challenge [10]. **Health policies and planning are the cornerstones of building a resilient and effective future health workforce.**

Kuhlmann et al. (2018) [47] highlighted that the involvement of the **health workforce themselves** is crucial to monitoring, implementing and evaluating the evolution of their own performance. Strengthening bottom-up **participatory approaches** contributes to engaging stakeholders and efficient top-down policy solutions as well as sustainable health workforce planning and cost-effective monitoring systems.

Stakeholders who are engaged in the educational process could mitigate sectorial differentiation and governance gaps and produce useful tools and interprofessional learning that boost health professionals' networks [64].

Regular monitoring and feed-back

Establishing regular monitoring and evaluation procedures are indispensable preconditions to promoting systematic reflection over time. Introducing **tools** that aim to **identify factors influencing** health staff **performance** can have a positive effect on improving workforce skills and **locating weaknesses** [9], [60]. A report on 'Skills for the future health workforce' by the OECD [10] cites the use of direct assessment tools for assessing skill sets related to teamwork, collaboration, person-centred communication and continuous learning. For example, using **direct skills assessment tools**, one can provide an objective assessment of a worker's skills compared to self-reporting tools. Example of tools for assessing skills such as problem solving are direct examinations or tests. In case of assessing the actual performance of the workforce, **observational tools** are used. An observer monitors and assesses worker's skills using structured tools.

To compensate for performance issues, training programmes have been introduced to assist the progress and **provide feedback** to participating staff members. Feedback aids to fill the gaps and identify the urgent lack of skills or competences [43]. On the other side of the spectrum, core skills assessment tools measure skills set related to **interprofessional collaboration, shared decision-making, individual-centred communication and continuous learning.** Continuous learning turns knowledge into quality improvement of care.

Task shifting

Task shifting is an innovative approach to mitigating health workforce shortages.

It offers more efficient use of human resources by delegating, shifting, moving, or sharing tasks within the care team from a highly trained worker to a less qualified person or a lay person and providing an additional training so that the newly delegated person can appropriately and adequately fulfil this new responsibility [65]. It is a particularly useful and efficient option in rural areas and marginalised urban communities.

Task shifting requires, among other things, good communication, well-structured and clear guidelines, monitoring and follow-up. One example of task shifting is when medicine prescription/dispensing or the provision of a clinical service is delegated by the physician to a patient's caregiver, a nurse, a machine or even to the patient themselves with the support for instance of a wearable or an IT tool. This innovative approach relates at the same time to the changing healthcare professional – patient relationship, digital transformation and health workforce shortages [66].

1.5. Lessons learnt from the literature review

The health sector is a challenging and constantly changing environment where the health workforce has to adjust to changes and keep performing at high standards at all times. However, health systems are currently inadequately equipped to prepare and train the health workforce to adjust to changing circumstances. Therefore, this paper investigates existing literature related to the main challenges impacting the skills needs of the health workforce.

First of all, it is recommended to invest in measuring and assessing **the skills needs of the health workforce** in a comprehensive manner at a large scale.

A high rate of skills supply-demand mismatches characterises a sector rooted in education and training. Policy makers should take health workforce needs into consideration and offer solutions to health workforce shortages and skills mismatches by stimulating the constant evolution of health professionals' skill mix.

The review revealed that the majority of papers identify education and training as the foundation for preparing the health workforce to respond to future challenges. Therefore, efficiently functioning and structured **education systems** are key. Health professionals should receive adequate training to respond to their duties and responsibilities, deliver high-quality care and be able to adapt to constantly changing environments and conditions. The uneven distribution (even within a country) and lack of health workforce raise the question **what precise types of education and planning** the health workforce would need in order to be able to meet the future needs of patients.

Through educational reforms, training arrangements and by prioritising health workforce reskilling and upskilling, policy makers can ensure that the current and future health workforce is equipped with the necessary and appropriate skills to meet the changing, increasing societal, economic and environmental demands.

The lack of digital and soft skills creates barriers to the performance of both the health workforce and health systems.

Tools and mechanisms are indispensable means to support the educational strategies of health professionals. When designing educational and training programmes, aspects of **direct assessment** and **eHealth awareness** should be taken into account.

Tools to measure staff performance could contribute to identifying the skills where health professionals perform at higher level and skills where they need improvement.

Evaluation procedures could contribute to boost health workforce competences. Feedback is the primary driver to identify the individual strengths and weaknesses and help those individuals cope with their skills gaps.

2. EU HPP Stakeholder Network on 'Profiling and Training the Healthcare Workforce of the Future'

This chapter retraces the origins and achievements of the EU Health Policy Platform Stakeholder Network on *'Profiling and Training the Healthcare Workforce of the Future'* and explains the consultation process conducted in 2022 with the network members to produce this paper.

2.1. From Thematic to Stakeholder Network

In 2020, EHMA and HFE jointly launched a **Thematic Network** dedicated to 'Profiling and Training the Healthcare Workforce of the Future' as part of the European Commission's European Health Policy Platform (EU HPP). The Thematic Network included more than 30 organisations representing various healthcare stakeholders with relevant experience to **inform a policy discussion** around the uptake of innovation and digital tools and the skills needs for that purpose; to **define the barriers** and incentives to improving health workforce skills; and finally to **promote health workforce education**, training, reskilling and upskilling.

The final output of the joint activities of the network in 2021 was the development of a Joint Statement67that presents a list of workforce education best practices and a set of policy recommendations which can be shared across borders. It highlights the role of healthcare professionals in promoting data-driven innovation.

In May 2021, this thematic network was transformed into **an official EU Stakeholder Network** in order to build a community of expertise and practice around the evolving topic of what skills the health workforce will require to meet the increasingly complex health needs of European citizens. The network currently includes more than 60 member organisations.

2.2. Methodology of the consultation

The Stakeholder Network was consulted with a view to exploring members' existing priorities around the essential skills needs of the European health workforce. The consultation process was carefully designed to ensure inclusiveness and the comprehensive collection of relevant inputs.

The consultation was designed following a three-step approach. As a first step, a focus group was established including Network member organisations selected according to specific criteria – see chapter 2.2.1. Establishing a focus group. As a second step, the website and publicly available documents of the focus group member organisations were analysed. Based on the desk research results, a draft report was produced to be then validated in step 3 first by the focus group members (workshops and interviews) and second by all the Network members via an online consultation.

2.2.1. Establishing a focus group

The focus group was established including organisations that responded to the following selection criteria: (i) health NGO and/or professional organisations based in Europe; and (ii) whose work does not focus on a specific pathology.

Using this approach, the following organisations, besides EHMA and HFE, were included in the focus group:

- **BioMed Alliance** - Biomedical Alliance in Europe
- **CPME** - Standing Committee of European Doctors
- **EAHP** -European Association of Hospital Pharmacists
- **EUPHA**- European Public Health Association
- **MedTech Europe**
- **UEMO**- European Union of General Practitioners/Family Physicians
- **Eurocarers**- European Association Working for Carers
- **EFN** - European Federation of Nurses Associations
- **EPF** - European Patients' Forum
- **EMSA** - European Medical Students' Association

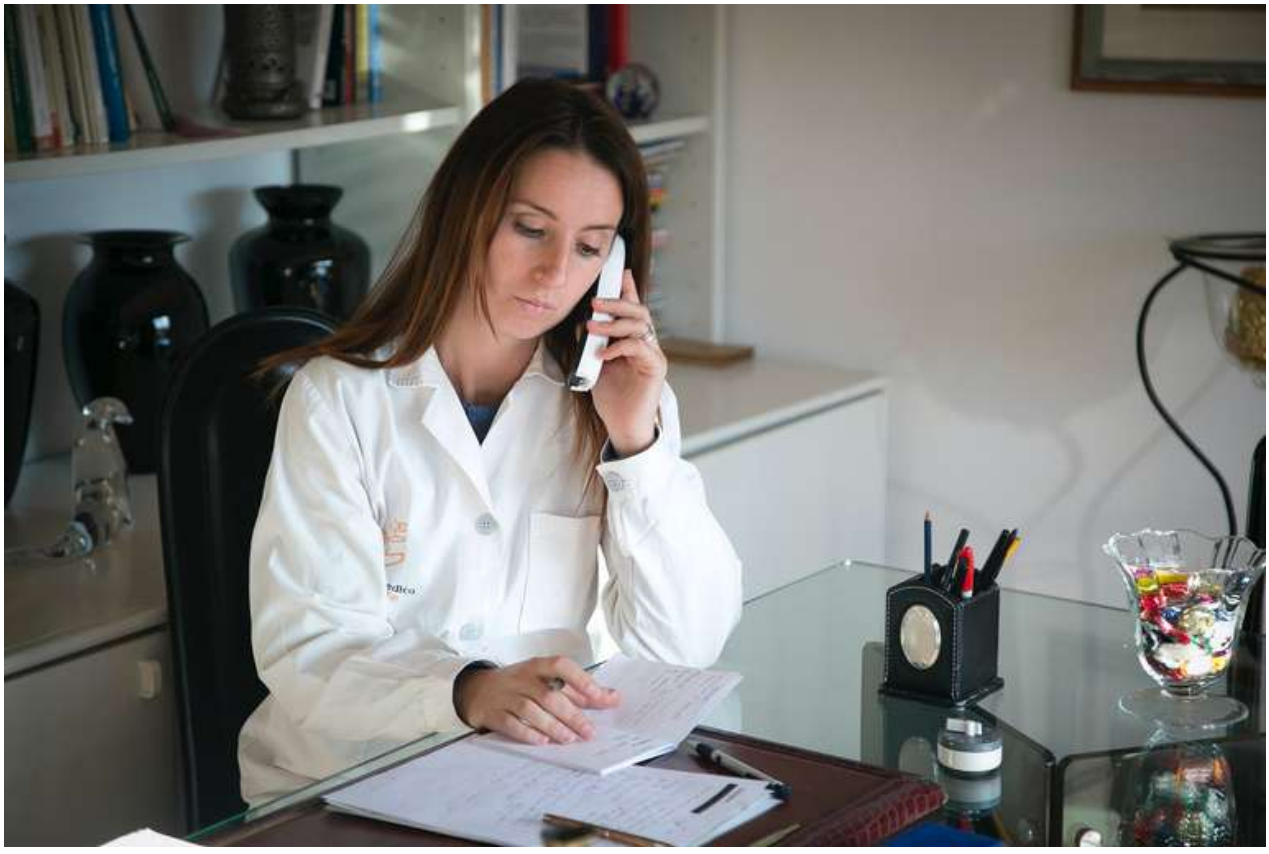
- **HOSPEEM** - European Hospital and Healthcare Employers' Association
- **EuroHealthNet** - European partnership for health, equity & wellbeing
- **ESNO** – European Specialist Nurses Organisation

2.2.2. Desk research

For each focus group member organisation, their webpages and publicly available documents - including reports; statements; publications; but excluding blog posts - were examined using the following keywords: competences, skills, training, health workforce, healthcare professionals, healthcare workforce, and healthcare professionals. Documents, articles and statements published in English were considered between January 2017 and February 2022. Articles referencing clinical skills, skills to treat specific patient groups or specific pathologies were excluded. Altogether more than 40 publicly available sources were consulted besides the websites of these organisations.

2.2.3. Validation

The draft report was validated (i) by the focus group and (ii) all members of the Stakeholder Network in two workshops, three bilateral interviews and an online consultation in August and September 2022.



3. Essential skills for a resilient and effective health workforce

It is important to highlight that the following list of essential skills has been established based on the input received only from the member organisations of the EU HPP Stakeholder Network on '*Profiling and Training the Healthcare Workforce of the Future*'. The list does not take into account skills that might be considered essential by other sources.

Based on the discussions and the desk research results, it was relatively easy to draw a matrix on what could make the **EU health workforce more resilient and effective by 2030** according to the selected network organisations.

However, the network organisations agreed that the requirements for upskilling and reskilling programmes and ambitions should first be met in the sector, meaning the **number of professionals providing care** who are expected to undertake further capacity building actions should be increased.

The principal challenge to solve is the shrinking and ageing workforce resulting in decreasing supply against increasing demand. A high percentage of professionals have recently left and more are still leaving their jobs in the sector. More and more people are in need of (long-term) care while a growing number of technologies are being produced and made available to apply and operate on a daily basis in a carefully regulated way. This necessarily implies that fewer professionals have to do more work and have to acquire more skills to perform their care duties up to high standards.

First of all, as a matter of urgency, the number of healthcare professionals should be stabilised and increased in the entire sector, in all three categories of the "health workforce" as defined in chapter 1.2.1 Health workforce. Only after that could the reskilling and upskilling programmes and the continuing professional development commence.

Therefore, the first step should be **a strategy and investment in health workforce retention and recruitment** which should at the same time address the current **gender inequity** in the sector and include measures to **improve the working conditions** of the professionals.

Having attracted more people to the healthcare workforce, four main aspects stood out from the discussions with the EU HPP Stakeholder Network member organisations to make the workforce more resilient:

1. Improving their digital and AI capabilities;
2. Boosting their communications skills to achieve better patient-centred care;
3. Increasing their interdisciplinary skills to foster collaboration between different disciplines and professionals; and
4. Green skills and climate education.

Note: some associations mentioned very specific requirements such as "elderly care skills" or "ethical skills". Although these are definitely necessary in some specific health professions, they were not included in the list of essential skills for a resilient and effective European healthcare sector as they were mentioned only by a small number of respondents.

Digital and AI skills	EFN	Eurocarers
	MedTech Europe	EuroHealth Net
	HFE	EAHP
	BioMed Alliance	HOSPEEM
	EHMA	ESMA
Communications skills	EPF	EuroHealth Net
	CPME	EHMA
	EAHP	UEMO
	EUPHA	
Interdisciplinary skills	EAHP	HFE
	ESMA	ESMA
	CPME	ESNO
Green skills	EuroHealthNet	EFN
	ESNO	EHMA
	BioMed Alliance	HOSPEEM
	CPME	EAHP

Figure 2. Essential skills for the future health workforce identified by the EU HPP Stakeholder Network associations

Many organisations within the EU HPP Stakeholder Network are engaged themselves in developing, providing and promoting training courses in the above-mentioned areas. Their experience, expertise and networks could be very valuable assets when it comes to developing training courses, materials or promoting them.

It has been raised by the Stakeholder Network members that very naturally, if new skills and new courses are recommended for inclusion in curricula as a priority, other courses and other skills might have to be de-prioritised in order not to overwhelm students and professionals already in the labour market.

For all four clusters of skills, experimenting and testing the new knowledge in real-life situations following the **simulation training principles** is very efficient [10]. Training by simulation saves lives. Simulation plays a role in learning any skills but is particularly important for interprofessional and interdisciplinary skills. Also, simulation training accelerates the learning curve and allows for moving professionals from one area to another in a safe manner.

In the next section, we consider each of the four key skills areas.

3.1. Digital, eHealth and AI skills

NGOs primarily highlighted the special need to increase the uptake of digital skills across all the health professions.

The COVID-19 pandemic and growing demands related to a rapidly aging workforce have put in evidence the lack of digital skills in certain segments of healthcare. Digital skill shortages by practitioners have been in a way endemic across many sectors, and digital skills are increasingly seen as essential for the **adaptability of the workforce**.

How can Europe improve this situation by 2030? First, healthcare professionals need to be equipped with a **minimum level of digital literacy**. There is a need to support digital health and digital literacy programmes and create **education methodologies** for continuing professional development.

This **basic level** of digital skills should be oriented to **understanding and using digital technologies, devices, and data analysis and sharing tools** (starting from electronic health records) to make the best use of innovative tools and promote their acceptance by other users. Health professionals should then be able to plan, organise and implement care, instruct and support those needing care, and analyse their own care quality, all while following technological developments on time. Some concrete areas to cover are **standardisation** and **data governance**.

More **advanced training** should also be available for the workforce. The more knowledge professionals have of digital tools, the better and more personalised care they can provide. One of the skills that most organisations highlighted was **AI skills and the ability to collect and interpret big data**. AI can address unmet needs and shortcomings in care68. Developing AI systems and algorithms requires specific skill sets69. A lack of sufficient AI- related health and digital literacy could result in data bias, and thus limit the reliability of data-driven technologies and AI algorithms.

As professionals tend to know what their most urgent needs are, this advanced training could focus on trying to make the workforce **co-designers of digital innovations** from an early start. Taking the example of AI, professionals should be present in the innovation process and in the development and implementation of the evidence needed on the delivery of digital solutions before these are made available to patients.

The digital innovation skill set of the profession could effectively tackle the rise of chronic conditions such as diabetes and heart disease, and associated NCDs behavioural/lifestyle risks factors among the elderly and will be key for better and more resilient care services by 2030.

The appropriate use of not only but mainly digital tools and devices implies the compliance with rules and regulations. The health and care sector has always been highly regulated to ensure mainly patient safety but also increasingly for environmental sustainability.

Healthcare professionals have to cope not only with the technological aspects of new medical technology but also with the regulatory framework. **Regulatory skills** have therefore also become essential to actively contribute to the regulatory system and the safety and appropriate use of medical technologies and medical products.

3.2. Communication skills

Communication skills were also one of the key skill areas mentioned by the network. Taken alone, training on digital skills will not be enough to get the workforce ready for the future challenges by 2030. There should also be a focus on how these professionals manage to communicate professionally and comprehensively with citizens/patients, including vulnerable and minority groups and their fellow doctors.

Good communication skills, for example, can bring valuable insights and help foster a **better working partnership**. In the healthcare sector, given the close interaction between professionals and patients, communication skills are vital to performing in difficult and emotional circumstances. Good communication skills help patients feel at ease, making them more likely to disclose the true extent of their feelings and symptoms, and tend to lead to **better patient outcomes** as well. Examples during the COVID-19 pandemic showed how much it was important to translate materials into minority languages and produce information materials in simplified languages in order to reach out to vulnerable and minority groups [70],[71].

Ageing and demographic change has already been mentioned as one of the major challenges impacting the healthcare sector. Adapted communication to older patients is crucial for healthcare professionals and carers – understanding the process of ageing and practicing empathy towards the older people in need of care. Patients' satisfaction is frequently used to measure the quality of health care delivery. Patients have expressed that adequate levels of communication among health professionals could improve their health outcomes and satisfaction as well as their safety.

Communication skills such as self-awareness, regulating emotions and recognising mistakes could help health professionals enhance their empathy and improve their relationships with patients [72].

Effective communication leads to patients being more aware of the treatment they are receiving on the one hand and increasing the ability of the professionals on the other hand to offer patients various options based on their unique concerns, needs and preferences. Communications skills are also needed to help doctors and, nurses explain, and patients understand, the use of new digital technologies including AI and population-wide data analyses.

Communication is central to the patient-doctor relationship. Yet, it is not any type of communication skills, but specifically **patient**-participation communication skills creating empathy towards patients with which the health workforce should be equipped. This skill set implies a significant improvement in **the relationship between caregivers and patients**. Therefore, it must be considered as a key skill to teach for a better and more resilient workforce.

Patient-participation has multiple dimensions. Just to mention a few which were particularly emphasised by the EU HPP Stakeholder Networks: (i) encouraging patients' **informed engagement** in care pathways, co-designing their own treatment, thus improving their understanding of the disease and also their active role in the patient-healthcare professional relationship and (ii) **combatting 'infodemic'** or pandemic of disinformation mainly spreading through the Internet but also via other channels and endangering public health and safety.

Communication skills should be integrated into professional training as well as in the academic curricula, considering already existing resources. Courses could involve exercises such as: "Structured approaches to complex patients" and "Practical interpretation of care models", among others.

To ensure that the communication trainings meet the needs of the targeted patients and citizens, the content and materials of the course should be co-created with patients.

EU HPP member organisations observed that **language knowledge** is a determining factor in accessing educational materials since very often, particularly the most recent documents and publications are available in English only before they appear in a translated version into EU national languages—if ever.

3.3. Interdisciplinary and collaboration skills

Finally, the network also highlighted that healthcare professionals should acquire better interdisciplinary and coordination skills. This shift towards more **horizontal care skills would make professionals better suited to the provision of care.**

An interdisciplinary approach involves healthcare professionals from different disciplines working collaboratively to take decisions and share resources and responsibilities for a common goal but also healthcare professionals collaborating with technicians including technology and environmental experts and administrative staff. An interdisciplinary approach should be the baseline for partnering with other professionals and challenging traditional boundaries.

Health professionals are in the front line of a wide range of risks due to their occupations. Therefore, it is crucial to implement policies to ensure that the healthcare work environment is safe and stimulates healthcare professionals' evolution and assures better health outcomes [73].

Healthcare professionals are often exposed to stressful situations, especially when they must treat serious episodes of care or deal with challenging working conditions. During the COVID-19 pandemic it became particularly exacerbated. Health professionals had to manage high stress levels, anxiety and other emotions that had an impact on their performance and mental health. Health professionals have to be equipped with the right set of coping skills such as physical self-care and mental well-being in order to be able to perform their tasks and remain resilient to stressful circumstances [74],[75].

Greater adaptability to different settings will help professionals grow and develop personal knowledge, skills and relationships, and it will help break down communication barriers between specialists. It will also help the healthcare community adopt a **collaborative, coordinated approach to technology development**, decision-making and patient management, ultimately finding innovative ways to deliver care. It will further help to build a team culture of **trust**, valuing diversity and making the most of other team members' backgrounds and skills, orienting the attention of the workforce towards **social determinants** of health as pivotal to true patient-centred approaches and assuring that they are addressed through intersectoral actions. It is particularly important for dealing with patients of diverse cultural background and often from disadvantaged social-economics contexts.

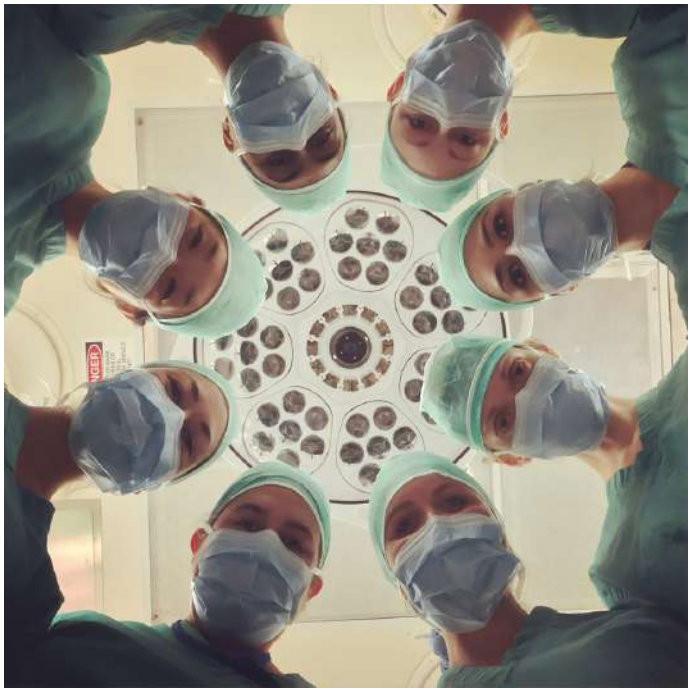
Instead of applying a purely biomedical approach to people and diseases, diagnosis and medication to a particular problem, a broader and more holistic **psychosocial approach** should be favoured by which the patient's social determinants and mental health are also taken into account when the most appropriate care pathway is recommended [76].

Current global health challenges such as COVID-19 have made the need to adopt integrated approaches for better health promotion and protection even more evident. It is highly recommended that health professionals should be able to recognise in their everyday practice the interdependence between human, animal and environmental health in line with the One Health approach at individual level but also at population and ecosystem levels [76].

Education and training are crucial to prepare future health professionals to build synergies across various sectors and enhance health outcomes [77],[78].

Among the stakeholders' recommendations, the most noted was to incorporate interdisciplinary and coordination skills into university curriculum units or modules on **soft skills empowerment** as well as reskilling health professionals who have already left university. The current and future health workforce then should be provided with possibilities for interdisciplinary education (e.g. clinicians, engineers, computer scientists, lawyers, ethicists, administrative staff, and lifestyle medicine focused on medical dietetics and exercise medicine). In addition, certified **inter-disciplinary management skills** should also be provided [79].

Finally, besides supporting healthcare professionals in developing interdisciplinary skills, the **needs of their educators** involved in the delivery of learning for interprofessional collaborative practice should also be investigated and recognised. It is an important foundation on which the interdisciplinary knowledge, skills and behaviours of the healthcare professionals can be built [80].



3.4. Green skills

The sector is becoming more and more conscious of the need towards green skills although the EU HPP member organisations also recognised that compared to digital skills, green skills are a bit more difficult to match with medical and care skills. Climate health literacy would definitely be an area to improve [81]. The environmental and sustainability objectives are achieved by interdisciplinary collaboration between medical and environmental or sustainability teams rather than combining medical education with environmental training – with some exceptions.

Certain dimensions of green or sustainability skills are better recognised than others. Waste disposal and management is more easily understood as part of environmentally friendly behaviour while green logistics, procurement or hospital building design prove to be more of niche areas with limited awareness among healthcare professionals.

One of the most evident and obvious endeavours in the health and care sector related to environment and sustainability is to reduce antimicrobial resistance in inpatient and outpatient treatments. Antimicrobial stewardship programmes have been run successfully to improve the quality of antimicrobial therapy, minimise antimicrobial resistance, and optimise clinical outcomes [72].

4. Calls to action

Fostering the healthcare workforce's core competences and encouraging EU Member States' collaboration to develop a common vision for the future of care delivery are essential to the achievement of a resilient health workforce by 2030. Based on the literature review and consultation findings, the EU HPP Stakeholder Network on '*Profiling and Training the Healthcare Workforce of the Future*' recommends the following 32 actions so that regional, national and EU policy makers can efficiently tackle the current health workforce skills challenges across the Union and help the health workforce prepare for future challenges.

European level calls to action

1. **Develop a strategy for health workforce retention and recruitment** that would at the same time address gender inequity in the sector and include measures to improve the working conditions of healthcare professionals. This strategy should be rolled out at national and regional levels.
2. **Promote gender-inclusive education** and raise awareness of gender-equality competencies.
3. **Invest in large-scale, comprehensive, reliable data** collection about health workforce needs (at EUROSTAT or CEDEFOP scale for example at European level, at ILO or WHO-scale at global level). This should be the first step towards successful planning and strategies to address the challenges that the health workforce has to face now and in the future.
4. **Develop a strategy** for a thorough and systematic reskilling and upskilling of the EU health workforce that will lead to better patient-centred, integrated care across Europe. This strategy should be rolled out at national and regional levels.
5. **Prioritise education and training** of the health workforce in political agendas to improve health systems' performance. Possible measures could include education and training reforms and addressing system limitations that prevent the health workforce from performing at the highest level.
6. Take advantage of and **utilise the network, good practices and experience of European associations and umbrella organisations**, such as the EU HPP member organisations, in developing and promoting concrete educational and training programmes for and within their respective constituencies.

Regional and national-level calls to action

7. **Prioritise education and training** of the health workforce in political agendas to improve health systems' performance. Possible measures could include education and training reforms and addressing system limitations that prevent the health workforce from performing at the highest level.
8. **Apply participatory approaches and engage the health workforce** in developing education and training programmes and also in monitoring, implementing and evaluating the evolution of their own performance. Introduce **assessment tools** and **regular feed-back** as sources of motivation.
9. Secure a continuous provision of infrastructure, equipment and knowledge to the educational and training institutions and educators of healthcare professionals to create the framework conditions of long-term reskilling and upskilling measures.

On digital skills

10. **Establish pan-European digital academies** for clinicians.
11. **Promote eHealth and digital tools** as part of sustainable local health policies and community approaches, with local schemes for guidance and support to make them work for everyone.
12. **Develop model courses as a guidance** at a European level that involves exercises such as: "Structured approaches to patients with complex needs", "Practical interpretation of Care Models", amongst others.
13. **Up-scale and effectively integrate digital competencies** into health professionals' education and training programmes at both undergraduate and postgraduate levels as well as through Lifelong Learning, staff exchange programmes and through pre-certification of medical societies. These programmes should include courses on big data processes in health care and AI applications.

14. **Secure inclusive digital education and training** embracing all levels of digital literacy, from basic to advanced.

15. **Fully incorporate IT solutions** into existing health and social care pathways and help health professionals make the best use of digital solutions to deliver better outcomes.

16. **Invest in educational programmes** about the benefits of digital health to change healthcare professionals' attitudes towards new technologies. Commission a European study to assess the **value of digital solutions** in terms of **patient safety** and health care systems' **financial sustainability**.

17. **Provide training on the prevailing regulatory framework**. The health and care sector is becoming more and more regulated, mainly for patient safety and security reasons. Health professionals have to understand and cope with regulations alongside the technological complexity of tools.

Communication skills

18. **Integrate communication skills**, particularly **patient-participation communication skills** with vulnerable groups and older persons and other soft skills into professional training in hospitals as well as in academic curricula, considering already existing resources, ideally as a core competency. **Engage with the patients** in the development of the communication training materials to make sure that their needs are met in terms of appropriate level of communication.

19. Embrace communication skills that encourage **patients' informed engagement** in co-designing their own treatment and playing an active role in the patient-healthcare professional relation while simultaneously training them to recognise and help stop the spread of disinformation.

20. **Develop model courses as a guidance** at European level that involve exercises such as: "Structured approaches to complex patients", "Practical interpretation of Care Models", amongst others.

21. **Promote educational programmes** that promote conceptual thinking and leave space for experimental learning.

22. **Improve access to novel educational materials and publications** by promoting foreign language skills since English is very often the first language in which these documents are available.

On interdisciplinary and collaboration skills

23. **Focus on adaptability** in the educational programmes, also by introducing flexible post-initial education and enabling individual customisation.

24. **Start by "train the trainers"**. The needs of educators of interdisciplinary skills facilitating coordination between different healthcare disciplines should be first assessed and recognised.

25. **Widely apply the simulation training method** as a means of education to pilot, experiment and foster interprofessional and interdisciplinary teamwork.

26. **Provide possibilities for interdisciplinary education and training** (e.g. clinicians, engineers, computer scientists, lawyers, ethicists, administrative staff).

27. **Provide certified training on interdisciplinary management** skills to match a rapidly transforming technological and socio-economic reality as well as supporting labour mobility across sector. Foster **coping and well-being skills** for the healthcare professionals so that they can deal with emotional and stressful situations.

28. **Increase the (mental) health literacy** of the healthcare workforce by integrating training on mental health in their curricula.
29. **Educate in the spirit of the 'one health' principle, recognising the interdependence between medical, animal and environmental health.**

On green skills

30. **Promote existing good practices** of green skills amongst health professionals. Use antimicrobial resistance as an obvious example.
31. **Raise awareness of green skills** in the health and care sector as integrated skills in healthcare professionals' education and training as well as collaboration with environmental experts in interdisciplinary teams.
32. **Increase the climate health literacy** of the healthcare workforce.

Conclusions and next steps

Healthcare professionals are essential to achieving and strengthening the resilience of our health and care systems. Their development and also their satisfaction largely depend on the basic education they receive in the formal educational system and later on the opportunities they are offered to learn new skills. The aim of this report is to cover a broad range of skills that are considered essential to training effective and resilient healthcare professionals for the future, professionals who are able to cope with new trends, challenges, stress, new regulations, increasing patient expectations, new personalised care models, and many others and keep performing their care duties to high standards. These essential skills are clustered around four areas: digital and AI-related skills, patient-centred communication skills, interdisciplinary and coordination skills, and green skills.

These essential skills suggested by the member organisations of the European Health Policy Platform (EU HPP) Stakeholder Network on 'Profiling and Training the Healthcare Workforce of the Future' largely correspond to the future essential skills which renowned researchers in scientific articles, the World Health Organisation (WHO) and the Organisation for Economic Co-operation and Development (OECD) recommend.

As a result of a comprehensive literature review and the work, experience and ambitions of the member organisations of the EU HPP Stakeholder Network, in Chapter 4 Calls to action, a number of recommendations are proposed for the attention of European, national and regional policy makers. The recommended actions vary from high strategy to the development of very concrete training programmes to facilitate the acquisition of particular skills. Although the calls to action address policy makers, as the report acknowledges their prominent role in creating the conditions for upskilling and reskilling and taking top-down measures to improve and prioritise healthcare workforce education and training, the practical implementation of these recommendations will require collaboration across many stakeholder groups in and outside of the healthcare sector.

The EU HPP Stakeholder Network member organisations are fully committed to helping European, national and regional-level actors implement these recommendations. To this end, they will create a detailed action plan for each of the recommendations and make them actionable for stakeholders and technical experts on the ground. They will also build synergies between the recommendations of this report and their work plan, working groups, other platforms, initiatives and projects in which they are involved in order to maximise the impact of their efforts and will prepare annual progress reports.

Abbreviations

BeWell– Blueprint Alliance for a Future Health Workforce Strategy on Digital and Green Skills
BioMed Alliance- Biomedical Alliance in Europe
CPD – Continuing Professional Development
CPME- Standing Committee of European Doctors DESI- Digital Economy and Society Index
EAHP- European Association of Hospital Pharmacists
EC – European Commission
ECVET- European credit system for vocational education and training
EFN- European Federation of Nurses Association
EHMA - European Health Management Association
EMSA- European Medical Students' Association
EPF- European Patients' Forum
ESNO- European Specialist Nurses Organisation
EU – European Union
EU HPP - EU Health Policy Platform
EUPHA- European Public Health Association
Eurocarers- European Association Working for Carers
EuroHealthNet- European partnership for health, equity & wellbeing
Eurostat- European Statistical Office
EUVECA – European Platform for Vocational Excellence in Health Care
HFE - Health First Europe
IT or ICT – Information (and Communication) Technology
HOSPEEM- European Hospital and Healthcare Employers' Association
LLL – Lifelong Learning
MedTech Europe- European Trade Association for the Medical Technology Industry
PPE – Personal Protective Equipment
OECD- Organisation for Economic Co-operation and Development
SDG – Sustainable Development Goal(s)
SEPEN- Support for the health workforce planning and forecasting expert network
UEMO- European Union of General Practitioners/Family Physicians
WHO-World Health Organization

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