# EMPOWERING EU HEALTH POLICIES ON TASK SHIFTING

# COLLECTION OF USEFUL TOOLS AND PRACTICES IN TASK SHIFTING

# FINAL REPORT

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## Executive summary

### Introduction

Task shifting is an important policy option to help ease workforce shortages and skill-mix imbalances especially in remote rural communities and socially marginalised urban communities. This report presents the results of an explorative study on the need for curriculum development in task shifting by the TaSHI project. This study provides an overview of existing good practices using a mixed-methods approach, including desk research of evidence in the scientific literature and findings of EU projects, a Delphi exercise and stakeholder interviews.

> **Task shifting** - *Tasks can be shifted from health workers to patients and their carers, to machines, and to other health workers (1). For example, when doctors are in short supply, a qualified nurse, midwife or the local health worker can prescribe and dispense medicine or provide clinical services and procedures.*

### Main results

The explorative desk research study identified a set of pre-requisites and five elements that are critical for enabling task-shifting:

1. **Pre-requisites for task shifting** – Suitable leadership, necessary resources, appropriate patient referral system, documentation, evidence-based guidelines, communication skills and record-keeping are pre-requisites.
2. **Interdisciplinary training and collaborative practice** – The academic literature review identified interdisciplinary education and the use of managed clinical networks as beneficial. Shared learning may be more effective in engaging health professionals and facilitating learning. Models for collaborative learning across disciplines need further research. Multi-professional training using case-focused scenarios provide a richer understanding and appreciation of the role of others. Specifically, they allow the practice of negotiating role differences and facilitating the development of individual professional competence that combines as effective teamwork.
3. **Transversal skills** – Transversal skills are not specific to a particular job, task or profession. Rather, these are skills are relevant in a wide variety of situations and work settings. They are increasingly in high demand and include critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship and media and information literacy. As such, they are added value skills for task shifting.
4. **Disruptive change and resilience** – The main features of the successful implementation of collaborative practice are: good communication between teams; relevant and timely

access to specialist services; coordinated patient care with continuous support, and; organisational climate and management support. Together, these provide opportunities to integrate the acquired skills needed for task shifting.

5. **Cultural sensitivity, flexibility and readiness** – Evidence suggests that education alone may be insufficient to change culture, and there is a need to explore initiatives that affect attitudes and behaviour. Therefore, training should address attitudes and clarification of roles and responsibilities as a priority.

Following this, the **findings from the Delphi exercise and interviews** with stakeholders mirrored the results of the literature review. The stakeholders consulted for this study agreed that an open culture is a key to task shifting, and internal disagreement and lack of supporting leadership as the main barrier. Integration of care, patient records keeping track of the patient journey, and on-time communication were the three most significant aspects of technology use in health care. Moreover, the stakeholders rated multidisciplinary training, seeing the bigger picture, teamwork, leadership, knowledge about the professions and scope of professions skills, innovation and digital transformation as the most relevant contents for the task-shifting curriculum.

## Conclusion and next steps

The knowledge from the literature review provides the foundation for developing the curriculum and training material for task shifting in the TaSHI project. Knowledge and models from the included EU projects ('MUNROS' and 'DISH'), as well as the stakeholder prioritisation will guide the content of the curriculum and choice of learning activities.

The next step of the TaSHI project and this work package is to develop a module-based curriculum and training materials, based on 1) theories of adult learning, 2) the Knowledge, Process and Practice- model, and 3) an open-access repository. Five case studies in five countries will pilot the curriculum and training material and provide feedback. Needs assessment will be carried out with each pilot site, and consultation with the TaSHI Advisory Board will provide some guidance during the process.

## 1. Introduction

The European Commission is dedicated to support the Member States in health workforce reform and to explore efficient ways for maintaining sustainable health systems and workforces in Europe. Task shifting and skill-mix innovations are considered functional methods that can contribute to more effective care organisation and human resources for health management. The TaSHI project entitled "Empowering EU health policies on **Ta**sk **SHI**fting" aims to provide a novel understanding of, and up-to-date knowledge on, task shifting and the transferability and uptake of good practices in implementation. The project will deliver several products and outputs: a collection of good practices, learning tools and methods, a guidebook on task shifting supporting the real-life implementation, case studies, practical training materials and curriculum, and recommendations for task shifting.

This report presents a collection of the 'state-of-the-art' with regard to task shifting. Knowledge is retrieved from academic literature review, a review of EU projects, and a Delphi exercise with stakeholder interviews are executed for this report. This has resulted in this collection that will underpin the development of training materials and curriculum for the case studies in task shifting in the TaSHI project.

## 2. Background

Health policymaking in the EU increasingly focuses on the sustainability of health systems. The distribution and allocation of human resources are essential to maintain sustainable health services (2). Efficient care management can contribute to this by optimised care pathways (3). Health workforce (HWF) planning is based on these policy directions to ensure the optimal number of health care personnel with the right skills at the right time and in the right place (4). The latest EU-level mapping study by the SEPEN tender (5) showed that many EU member states are experiencing a severe shortage of health care professionals, location problems with equitable access to care, HWF planning infrastructures and the significant effect of the COVID pandemic on their supply chains.

Against this backdrop, task shifting is an example of skill-mix innovation with great potential to improve HWF policies (6). It is driven by significant trends during the last decades, as the roles and responsibilities of health professionals have changed significantly, and these transitions need to be managed effectively (3).

**Task shifting** - *Tasks can be shifted from health workers to patients and their carers, to machines, and to other health workers (1). For example, when doctors are in short supply, a qualified nurse, midwife or the local health worker can prescribe and dispense medicine or provide clinical services and procedures.*

As the above definition shows, task shifting consists of task delegation and (re)sharing roles between health professions and shifts from professionals to patients or machines (1). Transferring or shifting tasks to individuals with other qualifications and training is an action to address the human resource crisis and critical to achieve and maintain a well-functioning health system. Well-structured concepts, guidelines and supporting tools are needed to mitigate the negative impacts and maximise the benefits of task shifting. Transversal skills are not specific to a particular job, task or profession. Rather, these are skills relevant in a wide variety of situations and work settings. They are increasingly in high demand for learners to successfully adapt to changes and include critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship and media and information literacy (7). Co-creation and inter-professional teams, as the cornerstone of integrated care, are significant assets but need the training of individuals with a different set of skills and sectoral knowledge to enable task shifting implementation.

## 3. Objectives and methods

This report presents the results of an explorative study on the need for curriculum development in task shifting using a mixed-methods approach, including desk research to retrieve insights from the scientific literature and findings of EU projects, as well as a Delphi exercise and stakeholder interviews.

The objective of the study is to explore four themes that illustrate good practices in task shifting:

1. Interdisciplinary training and collaborative practice
    a. a new approach to learning and sharing
2. Acquiring transversal skills
    a. right-skilling and upscaling of the health workforce
    b. knowledge, skills and competency sharing
    c. capabilities on digital health, leadership and management, and good governance
3. Disruptive change and resilience
    a. technology & organizational adaptation
    b. organizational reforms
    c. supportive working environments and supportive organisational culture
4. Cultural sensitivity, flexibility and readiness
    a. enhancing cultural sensitivity, flexibility and readiness - acquiring transversal skills, such as teamwork, communication, socio-cultural sensitivity, awareness

of professional and ethical standards, workers' own safety and well-being, and adaptive problem solving

b. flexibility for skill-mix, interdisciplinary teams and collaborative practice

Mapping these themes against existing practices will support identifying possible barriers to task shifting across EU member states. Further, the mapping will provide insight for facilitators about the implementation of task shifting.

For the desk research, we reviewed EU projects and scientific literature related to task shifting and relevant training in healthcare. EU-portals, academic research websites and the indexed databases Medline, Embase, Cochrane, Cinahl and Web of Science from 2000 were all searched. Appendix A and B provide the search strategies and the PRISMA flow chart (8) for the academic literature review.

Next, to validate and extend insights from the review of the academic literature and EU projects, we interviewed an international group of stakeholders and invited them for a Delphi exercise. This included a survey questionnaire (see Appendix D) and an online thematic workshop. The TaSHI Advisory Board and representatives of pilot studies responded first to the survey questionnaire. In an interactive online plenary workshop they then rated the barriers, facilitators, digitalisation of health care and learning needs for task shift. The questions in the Delphi survey built on the two EU projects presented above, but also on network initiatives as SEPEN, the Joint Actions on Health Workforce Planning and Forecasting, eHAction, and DIGI4ME to update insights about the skill needs on task shifting and sharing. We clustered the Delphi questions into five themes: 1) task shifting in general, 2) life-long learning and continuous education, 3) digital education, 4) automatisation of healthcare and 5) promoting task shifting.

# 4. Results

## 4.1. Academic literature review

In this chapter, we first summarise the results of the academic literature review that draws on 11 literature reviews on task shifting and education (9–19) and address the four types of good practices in task shifting mentioned in the previous chapter: interdisciplinary training and collaborative practice (1, 10, 12–15), acquiring transversal skills (1, 8, 10, 12–15), disruptive change and resiliency (1, 7, 10–14), and cultural sensitivity flexibility and readiness (1, 6, 9–13). Three appendices of this report provide more detail about the academic literature review:

- Appendix A shows the search strategy for the academic literature review
- Appendix B shows the PRISMA flow diagram

- Appendix C shows an overview of references included in the academic literature review

Below we present extracts from the literature reviews for each of the four task-shifting themes and practices.

### *1. Interdisciplinary training and collaborative practice*

Reviews show clear benefits of interdisciplinary training and effective use of managed interdisciplinary clinical networks for collaborative practice. In particular, interdisciplinary training using case-focused scenarios help to develop a richer understanding and appreciation of the role of others and allow participants to practice negotiating role differences and facilitating the development of individual professional competence and effective teamwork (19). There are also indications from the reviews that opportunities to practice, receive video-interactive feedback, and attend follow-up sessions to allow prolonged training can enhance competencies and support optimising the translation of learning outcomes into interdisciplinary clinical practice (17).

One of the reviews focused on rural maternity care and concluded that the registered maternity nurse might be the only nurse on the shift with intrapartum care experience (16). Another review addressed gout management, and two main alternatives to the usual care provided by primary care physicians are nurse-led care and a pharmacy-based model (10). Also, pre-intervention education, ongoing support and collaborative practice enable task-shift in nurse-led chronic disease management (18). Having said all of this, particular attention is needed to establish strategies for task shifting in medical deserts: socially marginalised urban, peripheral and remote rural communities (19).

### *2. Acquiring transversal skills*

Task-shifting is essential to improving the availability and productive efficiency (quality and cost) of health care services especially in under-served medical deserts. Accomplishing this requires investment in re-skilling health care professionals (14, 17,18). Attention is needed to enhanced clinical skills, transversal skills and revised organisational policies and protocols to facilitate task shifting. Transversal skills bring added value because they are not specific to a particular job, task or profession. Rather, these skills are relevant in a wide variety of situations and work settings. They are increasingly in high demand and include critical and innovative thinking, interpersonal skills, intrapersonal skills, digital health literacy, media and information literacy.

Examples from the reviews are: rural maternity nurses in Ontario, Canada that use Advanced Cardiac Life Support and Neonatal Resuscitation Program qualifications and participate in foetal surveillance and labour support workshops (16) and; nurses in the British gout management model who receive training according to the British Society for Rheumatology gout treatment guidelines (10). Another example is the doctor of nursing practice (DNP) trained to provide advanced clinical skills and knowledge, intellectual perspective and skills to

collaborate beyond borders – and translates this knowledge quickly and effectively, creating an opportunity for professional leadership (12).

### *3. Disruptive change and resilience*

Task shifting is a complex intervention that needs careful planning and implementation. One review shows that ongoing supervision and preparation of health professionals are needed. This can be facilitated through: attention to what motivates nurses; distinct role definitions; appropriate training of and tailored feedback to nurses undertaking the task and; building trust and acceptability with clinicians. Of course, the process of task shifting also needs the necessary resources, an appropriate patient referral system, and real-time access to relevant patient and operations data. Overall, such task shifting needs evaluation (11).

Other reviews concluded that: rural nurses are actively involved in reviewing best practice guidelines and adapting their nursing and medical protocols (16), nurse-led gout care based on individualised education and a treat-to-target approach has improved patient-centred outcomes (10), and nurse prescribers have adopted a patient-centred, evidence-based approach to practice and a holistic approach to the care and services, demonstrating knowledge and expertise about comorbidities (15).

The main features of the successful implementation of collaborative practice are good communication between teams, appropriate and timely access to specialist services, coordinated patient care and continuous support (14). Moreover, organisational climate and management support provide opportunities to integrate the acquired skills and have a positive training effect (17). On the other hand, organisational factors, role ambiguity and time constraints can impede implementation (18).

### *4. Cultural sensitivity, flexibility and readiness*

Effective teamwork needs cultural sensitivity, flexibility and readiness. These are enabled in different ways. First, guiding principles for leadership, common goals and conflict resolution. Second, consistency with the values, policies, structures and protocols of organisations. Third, initial attention to preliminary team-building and securing the commitment of individuals. Fourth, building consensus on the role of each team member. This needs attention to commonalities and discipline-specific differences, clarification of perspectives, language and confidentiality. Fifth, confidence and resources to address barriers to effective teamwork. These barriers can include: service conditions, differing employment, staff shortages impacting time and personnel resourcing, differing cases or workloads, differing resourcing, dedicated time to meet, discuss/contact/liaise, different access to each other and the need for central coordination/liaison roles.

Even with attention to the above four factors, a critical pivot for task shifting is when the interdisciplinary training is translated into and taken up by routine clinical care and different healthcare systems (10). This is evidenced in reviews on rural maternal care, mental health and palliative care.

The review on rural maternity care reported three factors as critical for successful long-term sustainability: (a) mutual respect of individuals' experience and caring, (b) understanding of the importance of continuing education to maintain and enhance skills, and (c) collaborative practice. Respect for background and willingness to seek advice enabled meaningful discussions and the support of less experienced team members. Continuing education, including collaborative work, best practice guidelines and attending rounds, ensured both nurses and doctors being up to date.

A key challenge identified by another review on mental health is nurse prescriber education and clinical supervision (15). The nurse prescriber courses vary in length, content, and relevance, which is significant for the adoption of the nurse prescriber role in health services, consumer safety and nurse prescriber accountability and credibility. In addition, clinical supervision with peers and experienced prescribers is essential. In dental medicine, traditional continuing education (lectures or workshops) does not change the behaviour of primary care providers (6). Targeted and interactive small group discussions, as well as teleconferencing sessions, appear to be more efficacious. Also, educational outreach visits appear to be effective in increasing the delivery of preventive services and reducing inappropriate prescribing practices. The effect of local opinion leaders in interventions to change behaviour was unclear (13). Further, evidence suggests that education alone may be insufficient to change culture, and there is a need to explore initiatives that affect attitudes and behaviour (14,17). Therefore, training should address attitudes as negative attitudes might block the willingness to strive for change in practice (17).

In palliative care, one of the reviews showed that clarification of roles and responsibilities is a priority, and collaborative models should clarify definitions and terminologies to reflect the roles and responsibilities of specialist and generalist services (14). Moreover, professional territorialism is a barrier to a working partnership as it may result in difficulties negotiating relationships, power issues, and concerns about deskilling, i.e. reducing the level of skill that a worker needs for a job by using new technology instead. Further, lack of consensus about the coordination responsibility for patients, development of care plans in isolation from other teams, and poor coordination between teams impede the continuity and effective coordination of care. Successful collaborative working models are cost-effective and have positive impacts, including empowering generalists, supporting staff in decision making, and increasing positive attitudes among generalists to specialist palliative care provision.

## Lessons for TaSHI

We identified five ways in which cultural sensitivity, flexibility and readiness can be embedded into teamwork. Specifically, with attention to: guiding principles; consistency with the values, policies, structures and protocols of organisations; preliminary team-building and securing the commitment of individuals; building consensus on team member roles; address barriers to effective teamwork. However, evidence suggests that training alone may be insufficient to change culture, and there is a need to explore initiatives that affect attitudes and behaviour.

Even with attention to the above five factors, a critical pivot for task shifting is when the interdisciplinary training is translated into and taken up by routine clinical care and different healthcare systems (10). This is evidenced in reviews on rural maternal care, mental health and palliative care. These findings will provide the foundation for developing the curriculum and training material for task shifting in TaSHI.

## 4.2. EU projects review

### The MUNROS project

The main aim of the MUNROS project (Health Care Reform: the iMpact on practice, oUtcomes and costs of New roles for health pROfeSsionals, 2012-2017) was to identify and measure changes in the roles and responsibilities of health professionals across nine different health systems in the EU before BREXIT (Czech Republic, England, Germany, Italy, the Netherlands, Poland and Scotland; one associate country, Norway, and; one applicant country, Turkey)(20). In addition, the project sought to assess the impact on health outcomes and health costs and explore the consequences of these changes for workforce planning. The project had a micro approach focusing on three well-defined clinical conditions and associated care pathways (breast cancer, type 2 diabetes and heart disease). The project had a cross-sectional design and used a mixed-methods approach, including systematic reviewing, analysis of routinely collected and registered data, qualitative methods (case studies) and extensive surveys.

The MUNROS project studied six dimensions related to task shifting:

1. Task and role division (who works on the pathway and who does what)
2. Patient experience and satisfaction with care
3. Associated cost implications
4. Consequences of task delegation
5. Optimal models of care
6. Implications for workforce planning

The MUNROS project concluded that new professional roles and extended roles for established professionals are vital for the sustainability of the future health care workforce. Personal motivation, competencies and experiences are change factors but professional relationships and influences dominate change. Countries with less innovative workforce teams require changes to training and regulation, and attention to nudging the culture away from legacy hierarchical models of care.

Comparing the results of the MUNROS project to the four-task shifting themes and practices shows the following:

### *1. Interdisciplinary training and collaborative practice*

Both governments and healthcare institutions play a central role in introducing task shifting through interdisciplinary training and collaborative practice. Despite new professional roles, established professions remain dominant. Further, new professionals focus on local needs and day-to-day interactions rather than connecting to relevant networks. These tendencies limit interdisciplinary training and collaborative practice.

### *2. Acquiring transversal skills*

Healthcare organisations are central sites for forming and transforming professional identities. Internal guidelines and protocols define the qualifications of the assistant and services roles. However, local education programs and accreditation rarely result in standardised job descriptions. Therefore, new professionals lack career development opportunities outside the organisation and acquiring transversal skills. Moreover, governments set rules for the qualification of new professional roles, most requiring university grade training.

### *3. Disruptive change and resiliency*

The local practices and day-to-day interactions between practitioners and managers are decisive for task shifting. They determine the willingness of individual physicians and local organisations to optimise workforce flexibility and support the (disruptive) change that is needed. Five mechanisms were promoting the development of the new professional roles; (1) specialisation to protect established professional jurisdictions, (2) standardisation rendering clinical work and knowledge both transferable and controllable, (3) working closely together and recognised as knowledgeable and competent, (4) doing the dirty work and (5) adjusting qualifications.

### *4. Cultural sensitivity, flexibility and readiness*

The MUNROS project developed a conceptual model for task shifting based on the statement that *"The ultimate aim of any health care system must be to use the entire workforce to their full potential without compromising outcomes or increasing cost" (20).*

## The MUNROS project's conceptual model for task shifting

The model has three levels: macro (Healthcare reforms/policy context), meso-level (organisational context: service delivery settings and their characteristics) and micro-level (teams and team processes). The model is based on the Integrated Team Effectiveness model by Lemieux-Charles & McGuire (2006) and provides a framework to guide the development of an optimal team, the infrastructure to underpin it, and points for improvement. Task shifting involves strategies at the organisational and team level, and in health care and education systems. It therefore requires cultural sensitivity, flexibility and readiness. Table 1 shows the MUNROS model distinguishing the requirements for task shifting at the organisational level and in the health and educational system.

| Organisational level | Health systems and education |
|---|---|
| *New professional roles*<br>Ensure explicit (partial/full) role in care coordination<br>Foster induction courses, training and re-training to improve all relevant skills including coordination of care skills and collaboration within and across sectors<br><br>*Multidisciplinary teams*<br>Support the integration of teams and in particular, new and changing roles and responsibilities within teams<br>Incentivize team work<br>Provide structures for teams to function at highest levels | *Service delivery*<br>Re-design healthcare settings<br>Scale up integrated care models/pathways, including standardized referral systems >><br><br>*Methods for information exchange (IT systems)*<br>Implement an integrated system of electronic medical records within and across organisations and sectors<br>Introduce/ strengthen eHealth and electronic records management systems to facilitate the sharing of patient information across settings<br><br>*Financing*<br>Focus on value-based/bundled payments to incentivize integration/coordination of care<br>Make explicit funds available to incentivize service to coordinate care within and across sectors<br>Join-up financing of health and social care delivery<br><br>*Education and training*<br>Revise competency frameworks to enhance team work skills, coordination (e.g. case management, knowledge about care coordination structures/focal points) and communication skills<br>Foster inter-professional training (versus uni-professional) of health professionals |

Table 1 - Toward optimal models of care: introducing new professional roles and integrated care from a health systems perspective (20)

## The DISH project

The DISH project (ERASMUS+ project Digital & Innovation Skills Helix in Health, 2018) was delivered by a consortium from Denmark, Germany, Norway, Poland, Spain, and the United Kingdom. It aimed to bridge the gap between the digitalisation of the healthcare sector and the lack of eHealth and innovation skills to fully benefit from eHealth/mHealth innovations among health and social care professionals (21,22). To accomplish this, it created, tested,

adapted and evaluated a framework programme to support the uptake of digital skills in the health sector.

The project defined digital literacy as: *"having the knowledge and ability to effectively and critically navigate, evaluate and create information using a range of digital technologies. A digitally literate person can use technology strategically to find and evaluate information, connect and collaborate with others, produce and share original content, and use the Internet and technology tools to achieve many academic, professional and personal goals" (21)*.

The baseline report of the DISH project emphasised a lack of targeted support programmes for digital literacy in the health sector and increased demand for digital skills for all health professionals. Key factors to obtain digital literacy are innovation readiness, requiring knowledge and certainty of being prepared for applying new technology. To prepare effectively for new technologies requires a valid competency assessment to ensure a sustainable increase in knowledge. However, effective implementable training programmes and measurable evaluation are lacking.

The DISH project has three key elements:

1. The Learning Innovation Unit (problem-oriented learning and flexibility of training),
2. Training on the job (digital coaches in practice),
3. Assessment (flexible adaption to individual requirements).

The results of the DISH project can be structured into two of the four task-shifting themes and practices identified in 4.1 above:

### *1. Interdisciplinary training and collaborative practice*

The DISH project showed that Learning Innovation Unit is a framework for co-creation fostering multidisciplinary collaboration, innovative attitudes and team learning, including on-the-job training to provide better development and uptake of technologies and digital solutions. The objectives are to stimulate explorative behaviour, support implementation and change management processes, support competence/skills development and capacity building in a team rather than in the individual and enhance collaboration between healthcare professionals and enterprises and a better understanding of needs.

The framework has eight domains with three tracks and specific tasks with summarised content and expected achievement. The three tracks are the organisation, healthcare professionals in the team and shared decision. The eight domains include value propositions (why and how), key activities (mandate and activities), key participants (who, how, competency), key resources, mechanisms of technology adoption (how and what), frame for multidisciplinary collaboration/ organisation (how), change/effect and the relationship between the learning and innovation, on-the-job training and assessment.

### 2. *Acquiring transversal skills*

The DISH project defines skills' training as the process of acquiring and improving a set of new or complex skills to deliver improved service, through participation in hands-on practical exercises in a secure environment, without running the risk of disturbing or harming the patient. The skills training is based on practice-related cases and done in specific simulation facilities or on-the-job and across professional groups and sectors targeting transversal skills.

The purpose of the On-the-Job Training concept is to acquire knowledge, skills and competencies through active participation. The starting point should always be the needs and values at both organisational and individual levels. Shared-decision making is central in the process, and the project had developed a checklist including 4 topics. The fundamental four principles in the consultation about "On-the-job training" are that both parties should be actively involved in the decision-making process, share knowledge, share their preferences and reach an agreement. The topics on the checklist include how to help the healthcare professionals and break down strategies to make them clear to everybody, how to make it easy, how to create something memorable, and how to create a social proof. The learning outcomes focus on: 1) knowledge about purpose and possibilities, 2) task skills and communication and 3) competency to combine knowledge and skills, acquire competencies to take responsibility and share relevant knowledge, and reflect on the possibilities, challenges and dilemmas.

#### Lessons for TaSHI

The MUNROS project identified five mechanisms promoting the development of the new professional roles; 1) specialisation to protect established professional jurisdictions, 2) standardisation rendering clinical work and knowledge both transferable and controllable, 3) working closely together and recognised as knowledgeable and competent, 4) doing the dirty work and 5) adjusting qualifications. Further, the MUNROS project's conceptual model for task shift recommend revising competency frameworks to enhance teamwork skills, coordination and communication skills.

The DISH Learning Innovation Unit framework for co-creation fosters multidisciplinary collaboration, innovative attitudes and team learning, including on-the-job training to provide better development and uptake of technologies and digital solutions. DISH defines skills' training as the process of acquiring and improving a set of new or complex skills to deliver improved service, through participation in hands-on practical exercises in a secure environment, without running the risk of disturbing or harming the patient. The purpose of the On-the-Job Training concept is to acquire knowledge, skills and competencies through active participation. The essential elements of the On-the-Job concept are the: 1) needs and value, 2) co-production and involvement and 3) champions and capacity. The starting point should always be the needs and values at both organisational and individual levels, and shared-decision making is central in the process.

**TaSHI will use the knowledge and models in the development of curriculum and learning material for task shifting.** The learning outcomes should enhance teamwork skills, coordination and communication skills, and the learning activities will foster inter-professional training. Further, we apply the DISH Learning Innovation Unit framework for co-creation addressing value propositions, key activities, key participants, key resources, mechanisms of technology adoption, the frame for multidisciplinary collaboration/ organisation, change/effect and the relationship between the learning and innovation, on-the-job training and assessment. Regarding essential elements of On-the-Job Training, we will involve the TaSHI pilot sites in identifying needs and value, co-production and involvement and champions and capacity to ensure shared decision making.

## 4.3. Stakeholder interviews

In this section, we present the combined results from the Delphi exercise, being the survey and the online workshop.

### Task shifting

In the Delphi questionnaire survey, task shifting was identified for nursing homes and primary care for older persons (physician assistants, nurse practitioners), in mental care (nurse practitioners), hospitals (physician assistants, nurse practitioners, specialized nurses, new professional roles), collaborative education (general practitioner students, post-graduate nurses), medicine (medical assistants, nurse), physiotherapy, and for temporarily expanded scopes of practice for several professional groups (advanced nurse practitioners, physician assistants, clinical technologists, medical care worker, dental hygienist).

### Barriers and facilitators to task shifting in general

In the Delphi survey and during the online workshop, the following general facilitators to task shifting were discussed:

- increased flexibility
- the persistent shortage of medical staff
- the context of crisis
- a well-structured organisation,
- economic, administrative and organisational context
- political willingness
- politically strong professional organisations promoting task shifting
- legal arrangements and national guidelines
- work with related institutions/ecosystems
- understanding of task shift as a mean to an end and support for the latter
- willingness to trust and give away tasks

- open culture

In addition, the following barriers were discussed:

- sustainable financial models
- payment mechanisms and incentive systems
- work habits
- internal disagreements and lack of supporting leaders
- lack of adequate support among medical staff and directors/chief executive officers
- old conflicts of nurses and doctors
- resistance of professional bodies (councils, unions and scientific associations)

The consulted experts and stakeholders were asked to rank the list of facilitators for task shifting. Figure 1 shows the raking results achieved at the survey and online workshop.


Figure 1 - Rating of facilitators and barriers to task shifting

The three main facilitators appeared to be an open culture, a well-structured organization and willingness and trust to give away tasks. Internal disagreements and lack of supporting leadership, the resistance of professional bodies, internal opposition to share the scope of practice, and working habits were ranked as the main barriers to task shifting. Moreover, some experts raised the issue that doctors tend to retain the task, funding and money protecting the wages. A common discussion theme was that leaders and health executives must create an open learning culture that facilitates task shifting.

## Digitalisation of healthcare

On the topic of digital education and digitalisation of healthcare, the Delphi survey asked: "Which main workflows in healthcare can be affected by the use of technology?" Seven

workflows were reported 1) patient journeys keeping track in health records, 2) digital tools can provide a good backup when adapting to new tasks, 3) digital information exchange, 4) artificial intelligence, decision making, and better payment systems, 5) supportive/on-time communication, 6) integration of care and 7) better patient education and involvement in care.

The highest-ranked workflows that can be affected by technology use were integration of care, patient journeys keeping track in the health record, and on-time communication, Figure 2. Having data for better managerial decisions was a new point raised during the discussion.

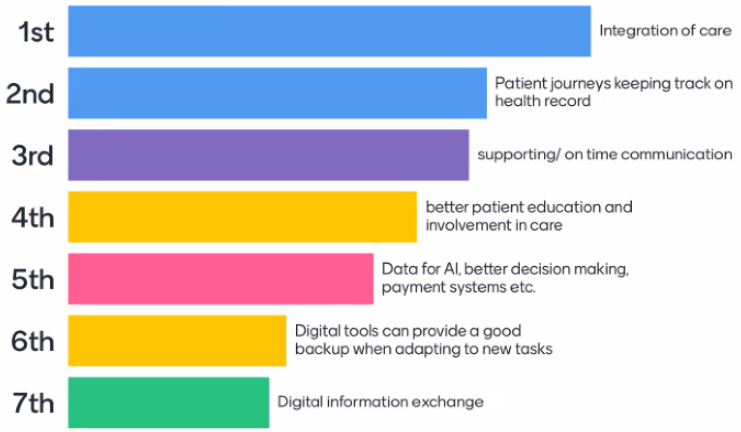


Figure 2 - Rating of health care workflows affected by the use of technology

## Training and promoting task shifting

Next, we addressed training and promoting task shift in the Delphi survey by asking, "What are the most important to address in the digital curriculum for task shifting, which we aim to take further into the development of the task-shifting curriculum?" The highlighted topics were 1) need for formal rules and basic principles, 2) knowledge about the profession and scope of the profession, 3) a digital dictionary and common language, 4) digital transformation, 5) the interplay of digital innovations in healthcare delivery with re-distribution of tasks, 6) skills, especially in the process of innovation and entrepreneurial skills, 7) teamwork, 8) multidisciplinary training, 9) growing trust by making opportunities voluntary, 10) showing/knowledge of the bigger picture on health services and outcomes, 11) leadership training for executives and learning from champions, and 12) including patients/citizens. Results are presented in Figure 3.

Interdisciplinary training and collaborative practice, multidisciplinary training, teamwork, and a broader perspective of how to improve health services and outcomes were ranked as the top priorities for promoting task shifting. Other priorities were: curriculum and learning outcomes to ensure that everybody understands each other; creating a digital dictionary, lexicon; the role of champions in designing the curriculum, sharing knowledge about digital

transformation and entrepreneurship, and; spirits to generate change was highlighted. Also, the patient's voice and perspectives should be taken into account. Therefore, patients should be involved in co-creating the curriculum and learning material design to ensure patient-centred care.

Task shifting takes place at micro-, meso- and macro levels. At the micro-level, changing individuals' attitudes, creating an open culture and willingness to shift tasks. On the meso-level, by well-structured organisations and leadership creating an open culture can facilitate the task-shifting endeavours. And at a macro-level, the agreement of stakeholders is a prerequisite for task shifting. Engagement for a joint mission and integration of care following closer and better-managed patient pathways need to be included in policymaking, enabling multidisciplinary training, an interdisciplinary approach and emphasis on transversal skills.

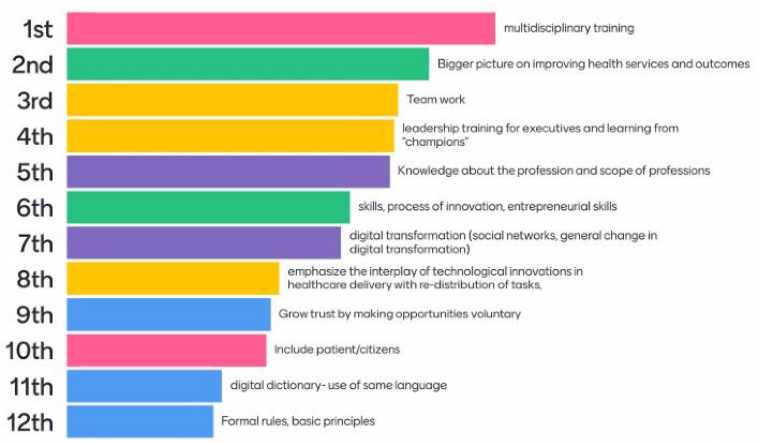


Figure 3 - Prioritized of topics for task shifting curriculum

## Lessons for TaSHI

The stakeholders consulted for this study agreed that an open culture is a key to task shifting, and internal disagreement and lack of supporting leadership as the main barrier. Their view corresponds well with our review of the EU projects and the academic literature. Integration of care, patient records keeping track of the patient journey, and supporting and on-time communication were the three most significant aspects of technology use in health care. Moreover, the stakeholders' rated multidisciplinary training, seeing the bigger picture, teamwork, leadership, knowledge about the professions and scope of professions skills, innovation and digital transformation as the most relevant contents of a curriculum for task shifting, reflecting findings of relevant EU projects and the academic literature.

## 5. Conclusion and next steps

The academic literature review identified interdisciplinary training as beneficial, and shared learning may be more effective in engaging health professionals and facilitating learning. Models for collaborative learning across disciplines need further research. The main features of the successful implementation of collaborative practice are good communication between teams, and organisational climate and management support provide opportunities to integrate the acquired skills. The review of EU projects identified that learning outcomes for task shifting should enhance teamwork skills, coordination and communication skills, and the learning activities will foster inter-professional training. The DISH Learning Innovation Unit framework for co-creation targeting transversal skills is applicable for task shifting. The stakeholders identified an open culture as a key to task shifting and multidisciplinary training, seeing the bigger picture, teamwork, leadership, knowledge about the professions and scope of professions skills, innovation and digital transformation as the most relevant contents for the task-shifting curriculum.

The knowledge from the literature review, as well as the knowledge and models from the MUNROS and DISH project, provide the foundation for developing the curriculum and training material for task shifting in the TaSHI project. The findings from the interviews and Delphi exercise with stakeholders mirrored the results of this desk research. The stakeholders consulted for this study agreed that an open culture is a key to task shifting, and internal disagreement and lack of supporting leadership as the main barrier. Integration of care, patient records keeping track of the patient journey, and on-time communication were the three most significant aspects of technology use in health care. Moreover, the stakeholders rated multidisciplinary training, seeing the bigger picture, teamwork, leadership, knowledge about the professions and scope of professions skills, innovation and digital transformation as the most relevant contents for the task-shifting curriculum.

The next step of the TaSHI project and this work package is to develop a module-based curriculum and training material, based on theories of adult learning (23), the Knowledge, Process and Practice- model (24), and an open-access repository after the principles of the LOVU-project. Figure 4 provides an overview of the Framework to be used in TaSHI.

| | **Knowledge**<br>***Sampling and reviewing a new knowledge base*** | **Process**<br>***Processing and linking the new and existing knowledge using a cognitive or practice-based framework*** | **Practice**<br>***Shared learning making practice explicit*** |
|---|---|---|---|
| | *Dissonance Phase* | *Refinement - Organisation - Feedback phase* | *Consolidation phase* |
| | **Knowledge** | **Skills** | **Competency** |
| **Learning outcomes** | *Knowledge-based learning outcomes* | *Process based learning outcomes* | *Practice based learning outcomes* |
| **Learning activities** | Knowledge test<br>Review knowledge | Case presentations<br>Digital simulation<br>*Promote observation, reflection, discussion and tailor feedback* | On-the-job training<br>Assessment of practice<br>*Promote reflection, discussion, shared learning and feedback* |
| **Presentation** | Video lectures/ demonstrations | Video cases presentations<br>Digital simulations | Real patients<br>Video recordings from practice |
| **Key resources** | Guidelines and protocols<br>Professional qualifications | Guidelines and protocols<br>Professional qualifications | Guidelines and protocols<br>Professional qualifications |
| **Assessment** | Formative<br>*Self-assessment with pre-prepared feedback* | Formative<br>*Expert assessment and feedback* | Formative or summative<br>*Expert judgements* |
| | **Learning management system and resource repository**<br>***Open access to learning and training material*** | | |

Figure 4 - Framework for development of curriculum and learning materials for task-shifting. Adapted from a framework by Sundling based on Taylor and Hamdy's model for adult learning and the KPP model for the development of online teaching (23–25)

The collection of good practices and stakeholder priorities presented in this report propose the learning outcomes schematized in Figure 5. Five case studies in five countries will pilot the curriculum and training material and provide feedback. We will do a needs assessment with each pilot and consult the TaSHI Advisory Board for guidance during the process.

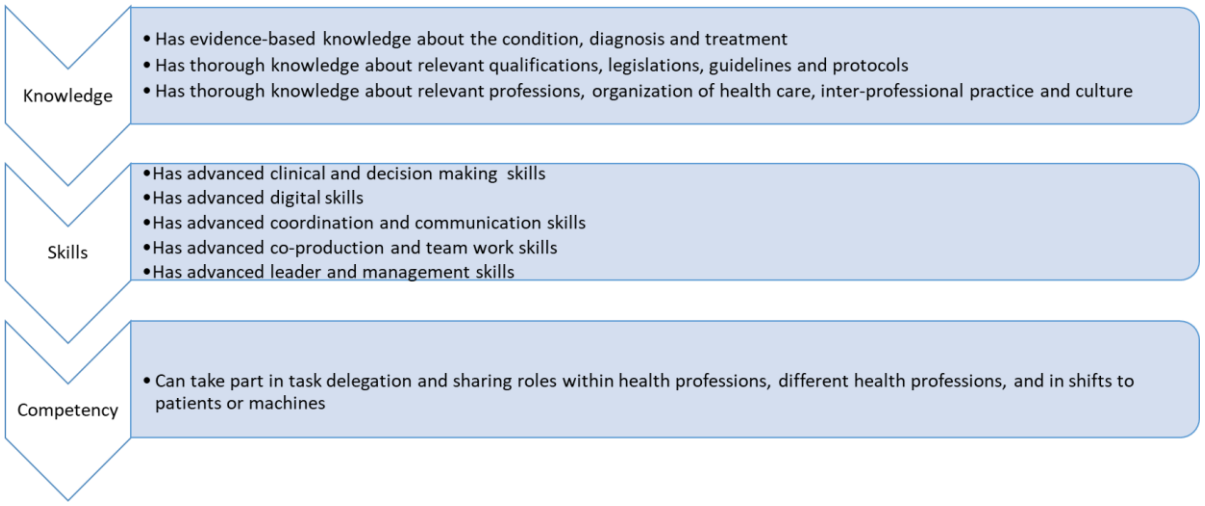


Figure 5 - Learning outcomes for task-shift curriculum

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# 7. Annexes

## Appendix A: Search strategy for the academic literature review

The academic literature was searched in Embase (Excerpta Medica Database) Medline, Cinahl Complete (Cumulative Index to Nursing and Allied Health), Cochrane and Web of Science on 1 June 2021. The search terms included combinations of subject headings and text words comprising task shift, health care personnel, education, and digital technology. The search was limited to literature reviews and the publication period 2000–2021. Please refer to the complete search strategies below.

In total, 1505 records were identified by the search and exported to the review software Rayyan (https://rayyan.qcri.org/). After the removal of duplicates, 1111 articles remained for abstract screening. The six reviewers screened one-third of the abstracts each, allowing screening of all abstracts by pairs of reviewers in a blinded process. The inclusion criteria for eligible papers were peer-reviewed literature reviews including health care providers, task-shift and education. Conflicts were discussed and resolved by another pair of reviewers. The reason for exclusion was recorded. Initially, 26 abstracts met the inclusion criteria for full-text screening. As only one of the articles concerned digital education, the review team decided to include all types of education. Altogether, the full-text of 41 articles were read and 11 included in the review. The remaining articles were excluded after full-text reading as they were not related to task-shift. The selection process is documented in the PRISMA flow chart in Appendix B. Four main themes were identified across the included articles, and excerpts from each article were extracted into a Microsoft Excel sheet, in addition to bibliographic information, Appendix C.

| **Ovid Medline In-Process citations. Search conducted 01.06.21** | | |
|---|---|---|
| 37 | limit 51 to "reviews (maximizes sensitivity)" | 671 |
| 36 | limit 35 to yr="2000 -Current" | 2518 |
| 35 | 21 and 25 and 31 and 34 | 2708 |
| 34 | or/32-33 | 1352355 |
| 33 | (computer* or digital* or remote* or electronic* or online* or web* or internet or multimedia or mobile or interactiv* or virtual*).ab,ti. | 1352326 |
| 32 | digital technology/ | 271 |
| 31 | or/26-30 | 353775 |
| 30 | ((educat* or school* or teach* or program* or train* or stud* or curricul*) adj2 (profession* or continuing or graduate* or postgraduate*)).ab,ti. | 79944 |
| 29 | life-long learning.ti,ab. | 383 |

| | | |
|---|---|---|
| 28 | curriculum/ or interdisciplinary studies/ | 80906 |
| 27 | exp Interdisciplinary Education/ | 143 |
| 26 | education, professional/ or exp education, continuing/ or exp education, graduate/ or exp education, medical/ or exp education, nursing/ or exp education, public health professional/ or interdisciplinary education/ | 281638 |
| 25 | or/22-24 | 2035453 |
| 24 | (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist*).ab,ti. | 1463158 |
| 23 | ((clinical or health* or care or medical or health care or healthcare) adj3 (manpower* or workforce* or human resource* or personnel* or professional* or staff* or worker* or visitor* or provider* or assistant*)).ab,ti. | 349258 |
| 22 | exp Health Personnel/ or exp Attitude of Health Personnel/ or caregivers/ or exp interdisciplinary relation/ | 686864 |
| 21 | or/1-20 | 352719 |
| 20 | (shar* adj3 decision*).ab,ti. | 10935 |
| 19 | ((new or expanded or enlarged or advanced) adj3 scope*-of-practice).ab,ti. | 236 |
| 18 | (Replace* adj3 (care or healthcare or health care)).ab,ti. | 789 |
| 17 | ((additional or advanced or new or extended or changed or expanded or supplementary or joint or shared or sharing or transversal) adj6 (task* or role* or skill* or competenc* or responsib*)).ab,ti. | 91950 |
| 16 | (new role* or chang* role* or shared care or joint consult* or Patient navigat*).ab,ti. | 13930 |
| 15 | (role* adj6 (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist*)).ab,ti. | 51829 |
| 14 | (professional* adj3 (autonom* or boundar*)).ab,ti. | 2095 |
| 13 | delegation.mp. or (exten* adj3 role*).ab,ti. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] | 7425 |
| 12 | ((care or healthcare) adj coordinat*).ab,ti. | 4818 |
| 11 | (Substitut* adj3 (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist*)).ab,ti. | 557 |
| 10 | ((service* or skill* or role* or task* or responsib*) adj3 transfer*).ab,ti. | 7593 |
| 9 | ((change* or extend* or expand* or transform*) adj3 (responsib* or skill* or boundar* or competenc*)).ab,ti. | 12007 |
| 8 | ((Shift* or liaison* or coordinat*) adj3 (care or role*)).ab,ti. | 18413 |
| 7 | ((multidisciplin* or multi-disciplin* or interdisciplin* or inter-disciplin*) adj3 (team* or round*)).ab,ti. | 31584 |
| 6 | teamwork.mp. or (team adj (work or approach or member* or training or educat* or interact*)).ab,ti. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept | 28018 |

| | | |
|---|---|---|
| | word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] | |
| 5 | ((task* or decision*) adj3 (shift* or reallocat* or allocat* or sharing or substit*)).ab,ti. | 7206 |
| 4 | ((collaborat* or cooperat*) adj6 (practice or Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist* or care or healthcare or health care)).ab,ti. | 35408 |
| 3 | ((chang* or multidisciplin* or multi-disciplin* or interdisciplin* or inter-disciplin*) adj3 (role* or collaborat* or cooperat*)).ab,ti. | 20672 |
| 2 | (skill* adj3 mix).ab,ti. | 1128 |
| 1 | Patient Care Team/ or Case management/ or Delegation, Professional/ | 77672 |

| **Database: Embase 1980 to 2021. Search conducted 01.06.21** | | |
|---|---|---|
| 36 | limit 35 to (yr="2000 -Current" and "review") | 384 |
| 35 | 21 and 25 and 31 and 34 | 3978 |
| 34 | or/32-33 | 1655666 |
| 33 | (computer* or digital* or remote* or electronic* or online* or web* or internet or multimedia or mobile or interactiv* or virtual*).ab,ti. | 1655608 |
| 32 | digital technology/ | 548 |
| 31 | or/26-30 | 417234 |
| 30 | ((educat* or school* or teach* or program* or train* or stud* or curricul*) adj2 (profession* or continuing or graduate* or postgraduate*)).ab,ti. | 95441 |
| 29 | life-long learning.ti,ab. | 548 |
| 28 | curriculum/ | 87834 |
| 27 | interdisciplinary Education/ | 2046 |
| 26 | continuing education/ or lifelong learning/ or masters education/ or medical education/ or paramedical education/ or social work education/ or nursing education/ | 315537 |
| 25 | or/22-24 | 2301767 |
| 24 | (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist*).ab,ti. | 1942423 |

| | | |
|---|---|---|
| 23 | ((clinical or health* or care or medical or health care or healthcare) adj3 (manpower* or workforce* or human resource* or personnel* or professional* or staff* or worker* or visitor* or provider* or assistant*)).ab,ti. | 453695 |
| 22 | health care personnel/ or caregiver/ | 263564 |
| 21 | or/1-20 | 398170 |
| 20 | (shar* adj3 decision*).ab,ti. | 15482 |
| 19 | ((new or expanded or enlarged or advanced) adj3 scope*-of-practice).ab,ti. | 316 |
| 18 | (Replace* adj3 (care or healthcare or health care)).ab,ti. | 1059 |
| 17 | ((additional or advanced or new or extended or changed or expanded or supplementary or joint or shared or sharing or transversal) adj6 (task* or role* or skill* or competenc* or responsib*)).ab,ti. | 114205 |
| 16 | (new role* or chang* role* or shared care or joint consult* or Patient navigat*).ab,ti. | 17730 |
| 15 | (role* adj6 (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist*)).ab,ti. | 59321 |
| 14 | (professional* adj3 (autonom* or boundar*)).ab,ti. | 2435 |
| 13 | (delegation or (exten* adj3 role*)).ab,ti. | 7952 |
| 12 | ((care or healthcare) adj coordinat*).ab,ti. | 7283 |
| 11 | (Substitut* adj3 (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist*)).ab,ti. | 681 |
| 10 | ((service* or skill* or role* or task* or responsib*) adj3 transfer*).ab,ti. | 9399 |
| 9 | ((change* or extend* or expand* or transform*) adj3 (responsib* or skill* or boundar* or competenc*)).ab,ti. | 13882 |
| 8 | ((Shift* or liaison* or coordinat*) adj3 (care or role*)).ab,ti. | 25601 |
| 7 | ((multidisciplin* or multi-disciplin* or interdisciplin* or inter-disciplin*) adj3 (team* or round*)).ab,ti. | 57320 |
| 6 | (teamwork or (team adj (work or approach or member* or training or educat* or interact*))).ab,ti. | 39580 |

| | | |
|---|---|---|
| 5 | ((task* or decision*) adj3 (shift* or reallocat* or allocat* or sharing or substit*)).ab,ti. | 8697 |
| 4 | ((collaborat* or cooperat*) adj6 (practice or Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist* or care or healthcare or health care)).ab,ti. | 49389 |
| 3 | ((chang* or multidisciplin* or multi-disciplin* or interdisciplin* or inter-disciplin*) adj3 (role* or collaborat* or cooperat*)).ab,ti. | 26522 |
| 2 | (skill* adj3 mix).ab,ti. | 1364 |
| 1 | case management/ or | 13650 |

| **Cinahl Complete. Search conducted 01.06.21** | | | |
|---|---|---|---|
| S40 | S24 AND S33 AND S34 AND S37 | Limiters - Published Date: 20000101-20211231; Peer Reviewed; Research Article; Clinical Queries: Review - High Sensitivity | 141 |
| S39 | S24 AND S33 AND S34 AND S37 | Limiters - Published Date: 20000101-20211231; Peer Reviewed; Research Article | 1,216 |
| S38 | S24 AND S33 AND S34 AND S37 | | 1,943 |
| S37 | S35 OR S36 | | 399,451 |
| S36 | AB ( (computer* or digital* or remote* or electronic* or online* or web* or internet or multimedia or mobile or interactiv* or virtual*) ) OR TI ( (computer* or digital* or remote* or electronic* or online* or web* or internet or multimedia or mobile or interactiv* or virtual*) ) | | 397,509 |
| S35 | (MH "Digital Technology+") | | 4,033 |
| S34 | S29 OR S30 OR S31 OR S32 | | 343,044 |
| S33 | S25 OR S26 OR S27 OR S28 | | 871,705 |
| S32 | AB ( ((educat* or school* or teach* or program* or train* or stud* or curricul*) N2 (profession* or continuing or graduate* or postgraduate*)) ) OR TI ( ((educat* or school* or teach* or program* or train* or stud* or curricul*) N2 (profession* or continuing or graduate* or postgraduate*)) ) | | 66,377 |
| S31 | AB life-long learning OR TI life-long learning | | 313 |
| S30 | (MH "Education, Interdisciplinary") | | 6,092 |

| | | | |
|---|---|---|---|
| S29 | (MH "Curriculum+") OR (MH "Education, Health Sciences+") | | 307,675 |
| S28 | AB ( ((clinical or health* or care or medical or health care or healthcare) N3 (manpower* or workforce* or human resource* or personnel* or professional* or staff* or worker* or visitor* or provider* or assistant*)) ) OR TI ( ((clinical or health* or care or medical or health care or healthcare) N3 (manpower* or workforce* or human resource* or personnel* or professional* or staff* or worker* or visitor* or provider* or assistant*)) ) | | 239,766 |
| S27 | (MH "Interprofessional Relations+") | | 32,385 |
| S26 | (MH "Caregivers") | | 37,232 |
| S25 | (MH "Health Personnel+") OR (MH "Attitude of Health Personnel+") | | 665,618 |
| S24 | S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 | | 225,201 |
| S23 | AB (shar* N3 decision*) OR TI (shar* N3 decision*) | | 6,781 |
| S22 | AB ( ((new or expanded or enlarged or advanced) N3 scope*-of-practice) ) OR TI ( ((new or expanded or enlarged or advanced) N3 scope*-of-practice) ) | | 298 |
| S21 | AB ( (Replace* N3 (care or healthcare or health care)) ) OR TI ( (Replace* N3 (care or healthcare or health care)) ) | | 913 |
| S20 | AB ( ((additional or advanced or new or extended or changed or expanded or supplementary or joint or shared or sharing or transversal) N6 (task* or role* or skill* or competenc* or responsib*)) ) OR TI ( ((additional or advanced or new or extended or changed or expanded or supplementary or joint or shared or sharing or transversal) N6 (task* or role* or skill* or competenc* or responsib*)) ) | | 33,415 |
| S19 | AB ( (new role* or chang* role* or shared care or joint consult* or Patient navigat*) ) OR TI ( (new role* or chang* role* or shared care or joint consult* or Patient navigat*) ) | | 21,036 |
| S18 | AB ( (role* N6 (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social | | 49,978 |

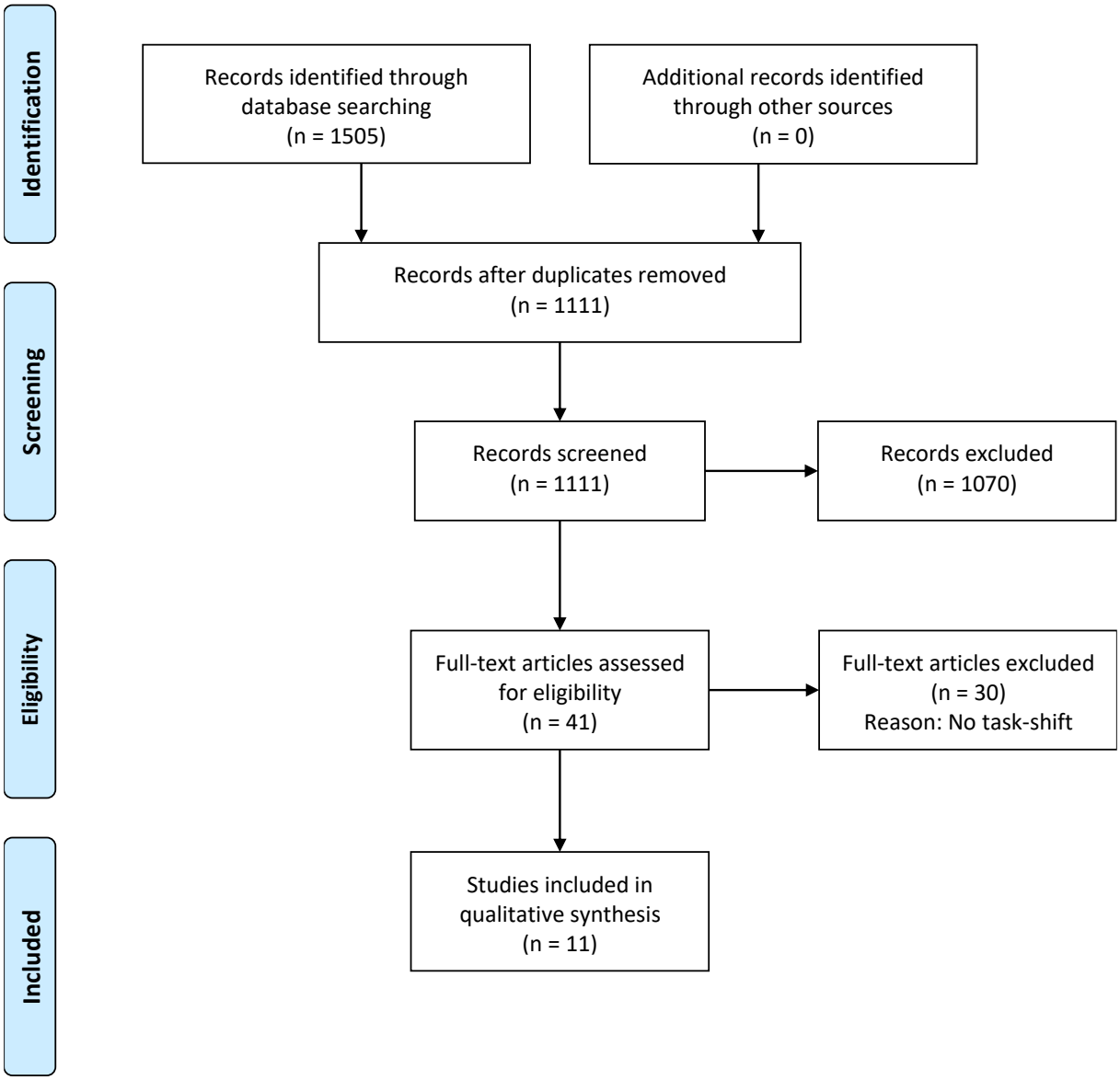
| | | | |
|---|---|---|---|
| | work* or paramedic* or radiographer* or radiolog* or radi* technologist*)) ) OR TI ( (role* N6 (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist*)) ) | | |
| S17 | AB ( (professional* N3 (autonom* or boundar*)) ) OR TI ( (professional* N3 (autonom* or boundar*)) ) | | 2,332 |
| S16 | AB ( (delegation or (exten* N3 role*)) ) OR TI ( (delegation or (exten* N3 role*)) ) | | 3,369 |
| S15 | AB ( ((care or healthcare) N1 coordinat*) ) OR TI ( ((care or healthcare) N1 coordinat*) ) | | 7,897 |
| S14 | AB ( (Substitut* N3 (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist*)) ) OR TI ( (Substitut* N3 (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist*)) ) | | 404 |
| S13 | AB ( ((service* or skill* or role* or task* or responsib*) N3 transfer*) ) OR TI ( ((service* or skill* or role* or task* or responsib*) N3 transfer*) ) | | 2,818 |
| S12 | AB ( ((change* or extend* or expand* or transform*) N3 (responsib* or skill* or boundar* or competenc*)) ) OR TI ( ((change* or extend* or expand* or transform*) N3 (responsib* or skill* or boundar* or competenc*)) ) | | 4,496 |
| S11 | AB ( ((Shift* or liaison* or coordinat*) N3 (care or role*)) ) OR TI ( ((Shift* or liaison* or coordinat*) N3 (care or role*)) ) | | 13,414 |
| S10 | AB ( ((multidisciplin* or multi-disciplin* or interdisciplin* or inter-disciplin*) N3 (team* or round*)) ) OR TI ( ((multidisciplin* or multi- | | 18,009 |

| | | | |
|---|---|---|---|
| | disciplin* or interdisciplin* or inter-disciplin*) N3 (team* or round*)) ) | | |
| S9 | AB ( (teamwork or (team N1 (work or approach or member* or training or educat* or interact*))) ) OR TI ( (teamwork or (team N1 (work or approach or member* or training or educat* or interact*))) ) | | 21,299 |
| S8 | AB ( ((task* or decision*) N3 (shift* or reallocat* or allocat* or sharing or substit*)) ) OR TI ( ((task* or decision*) N3 (shift* or reallocat* or allocat* or sharing or substit*)) ) | | 3,312 |
| S7 | AB ( ((collaborat* or cooperat*) N6 (practice or Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist* or care or healthcare or health care)) ) OR TI ( ((collaborat* or cooperat*) N6 (practice or Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or social work* or paramedic* or radiographer* or radiolog* or radi* technologist* or care or healthcare or health care)) ) | | 27,042 |
| S6 | AB ( ((chang* or multidisciplin* or multi-disciplin* or interdisciplin* or inter-disciplin*) N3 (role* or collaborat* or cooperat*)). ) OR TI ( ((chang* or multidisciplin* or multi-disciplin* or interdisciplin* or inter-disciplin*) N3 (role* or collaborat* or cooperat*))) | | 10,398 |
| S5 | AB (skill* N3 mix) OR TI (skill* N3 mix) | | 1,365 |
| S4 | (MH "Skill Mix+") | | 2,792 |
| S3 | (MH "Delegation of Authority") | | 2,089 |
| S2 | (MH "Case Management") | | 17,847 |
| S1 | (MH "Multidisciplinary Care Team+") | | 47,505 |

| **Cochrane Library. Search conducted 01.06.21** | | |
|---|---|---|
| #1 | (((skill* NEAR/3 mix) ) OR (((chang* or multidisciplin* or multi-disciplin* or interdisciplin* or inter-disciplin*) NEAR/3 (role* or collaborat* or cooperat*) )) OR (((collaborat* or cooperat*) NEAR/6 (practice or Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or | 35332 |

| | | |
|---|---|---|
| | carer* or caretaker* or "social work" or paramedic* or radiographer* or radiolog* or "radiation technologist" or care or healthcare or "health care") )) OR (((task* or decision*) NEAR/3 (shift* or reallocat* or allocat* or sharing or substit*) )) OR ((teamwork or (team NEAR (work or approach or member* or training or educat* or interact*) ))) OR (((multidisciplin* or multi-disciplin* or interdisciplin* or inter-disciplin*) NEAR/3 (team* or round*) )) OR (((Shift* or liaison* or coordinat*) NEAR/3 (care or role*) )) OR (((change* or extend* or expand* or transform*) NEAR/3 (responsib* or skill* or boundar* or competenc*) )) OR (((service* or skill* or role* or task* or responsib*) NEAR/3 transfer*)) OR ((Substitut* NEAR/3 (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or "social work" or paramedic* or radiographer* or radiolog* or "radiation technologist") )) OR (((care or healthcare) NEAR1 coordinat*)) OR ((delegation or (exten* NEAR/3 role*) )) OR ((professional* NEAR/3 (autonom* or boundar*) )) OR ((role* NEAR/6 (Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or "social work" or paramedic* or radiographer* or radiolog* or "radiation technologist") )) OR (("new role" or "changed role" or "shared care" or "joint consultation" or "Patient navigation") ) OR (((additional or advanced or new or extended or changed or expanded or supplementary or joint or shared or sharing or transversal) NEAR/6 (task* or role* or skill* or competenc* or responsib*) )) OR ((Replace* NEAR/3 (care or healthcare or "health care") )) OR (((new or expanded or enlarged or advanced) NEAR/3 "scope-of-practice")) OR ((shar* NEAR/3 decision*) )):ti,ab,kw (Word variations have been searched) | |
| #2 | (((clinical or health* or care or medical or "health care" or healthcare) NEAR/3 (manpower* or workforce* or "human resources" or personnel* or professional* or staff* or worker* or visitor* or provider* or assistant*) )) OR ((Physician* or general-practitioner or GP or doctor* or consultant* or specialist* or clinician* or MD-extender* or physician-extender* or nurse* or ophthalmologist* or optometrist* or optician* or caregiver* or carer* or caretaker* or "social work" or paramedic* or radiographer* or radiolog* or "radiation technologist")) | 195276 |
| #3 | (((educat* or school* or teach* or program* or train* or stud* or curricul*) NEAR/2 (profession* or continuing or graduate* or postgraduate*))) OR ("life-long learning") | 13907 |
| #4 | ((computer* or digital* or remote* or electronic* or online* or web* or internet or multimedia or mobile or interactiv* or virtual*)) | 154651 |
| #5 | #1 AND #2 AND #3 AND #4 with Cochrane Library publication date Between Jan 2000 and Dec 2021, in Cochrane Reviews, Trials | 312 |
| #6 | #1 AND #2 AND #3 AND #4 with Cochrane Library publication date Between Jan 2000 and Dec 2021, in Cochrane Reviews | 95 |

## Appendix B: PRISMA flow diagram



# Appendix C: Overview of references included in the academic literature review

| Authors | Year | Title | Journal | Aim | Methods | References | Main findings |
|---|---|---|---|---|---|---|---|
| Cleary et al | 2017 | Mental health nurse prescribing: A qualitative, systematic review | International Journal of Mental Health Nursing | To identify and summarize qualitative research that focussed on mental health nurse prescribing | Systematic review | 12 | Adequate education and continuing professional development inclusive of clinical supervision<br>enable competency development |
| Duprez et al | 2016 | The effectiveness of interventions to enhance self-management support competencies in the nursing profession: a systematic review | Journal of Advanced Nursing | To explore the effectiveness and effective components of training interventions to enhance nurses' competencies in self management support in chronic care | Systematic review | 25 | Theory-driven training interventions with time to practice, (video) feedback and follow-up generated the most training effects. Caution is needed due to the inconsistent study quality. |
| Gardiner et al | 2012 | Factors supporting good partnership working between generalist and specialist palliative care services: a systematic review | British Journal of General Practice | To explore factors that support partnership working between specialist and generalist palliative care providers. | Systematic review | 22 | Factors supporting good partnership working included: good communication between providers; clear definition of roles and responsibilities; opportunities for shared learning and education; appropriate and timely access to specialist palliative care services; and coordinated care. |
| Hillier et al | 2010 | A Systematic Review of Collaborative Models for Health and Education Professionals Working in School Settings and Implications for Training | Education for health | To answer the questions: what are the reported models of best practice to support the collaboration between education and health staff and what are the implications for training strategies at an undergraduate and postgraduate level to affect these models? | Systematic review | 34 | Models of interaction and teamwork are well-described, but not necessarily well-evaluated. They include a spectrum from consultative to collaborative and interactive teaming. It is suggested that professionals may not be adequately skilled in, or knowledgeable about, teamwork processes or the unique roles each group can play in collaborations. |
| Ireland et al | 2007 | Competencies and skills for remote and rural maternity care: a review of the literature | Journal of Advanced Nursing | To review the literature on skills, competencies and continuing professional development necessary for sustainable remote and rural maternity care | Review | Not reported | 'Hands-on' skills courses such as Advanced Life Support in Obstetrics and the Neonatal Resuscitation Programme increase confidence in practice, but no published evidence of effectiveness of such courses exists. |

| Authors | Year | Title | Journal | Aim | Methods | References | Main findings |
|---|---|---|---|---|---|---|---|
| Karimi-Shahanjarini et al | 2019 | Barriers and facilitators to the implementation of doctor-nurse substitution strategies in primary care: a qualitative evidence synthesis (Review) | Cochrane Database of Systematic Reviews | To identify factors influencing implementation of interventions to substitute doctors with nurses in primary care. | Systematic review | 69 | Doctors and nurses pointed to the importance of having access to resources, such as enough staff, equipment and supplies; good referral systems; experienced leaders; clear roles; and adequate training and supervision. But they often had problems with these issues. They also pointed to the huge number of documents they needed to complete when tasks were moved from doctors to nurses. |
| Latif et al | 2018 | Are Doctors the Best People to Manage Gout? Is There a Role for Nurses and Pharmacists? | Current Rheumatology Reports | To discuss alternate models of long-term gout management | Review | Not reported | Individualised education about gout, patient involvement in decision-making, and access to trained support may be best achieved with nurse-led care. |
| Medeves et al | 2005 | Sustaining rural maternity care — Don't forget the RNs | Canadian Journal of Rural Medicine | To conduct a systematic review of the maternal–child–nursing literature in rural locations | Review | Not reported | To care for pregnant women and their families, registered nurses require many of the same considerations that physicians have outlined: access to continuing education, appropriate call-back schedules, support from other health care professionals and administrators, and a value system that respects their expertise. |
| Sohn et al | 2004 | Efficacy of Educational Interventions Targeting Primary Care Providers' Practice Behaviours: an Overview of Published Systematic Reviews | Journal of Public Health Dentistry | To present findings from systematic reviews on the efficacy of continuing medical education, printed educational material, academic outreach, reminders, and local opinion leaders on the adoption of new knowledge and practices by primary care providers | Review of reviews | 11 | Formal continuing medical education (CME) and distributing educational materials did not effectively change primary care providers' behaviours. There are effective interventions available to increase knowledge and change behaviours of primary care providers, such as small group discussion, interactive workshops, educational outreach visits, and reminders. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Stephen et al | 2017 | The feasibility and acceptability of nurse-led chronic disease management interventions in primary care: An integrative review | Journal of Advanced Nursing | To explore the feasibility and acceptability of nurse-led chronic disease management and lifestyle risk factor reduction interventions in primary care | Integrative review | 11 | Literature supports the feasibility and acceptability of nurse-led interventions In primary care for lifestyle risk factor modification. The ongoing sustainability of these interventions rests largely on organizational factors such as funding, educational pathways and professional support of the primary care nursing role. |
| Walker et al | 2015 | Doctor of nursing practice: The role of advanced practice nurse | Seminars in Oncology Nursing | To explore the evolution and emerging roles of the Doctor of Nursing Practice (DPN) Advanced Practice Nurse (APN) | Review | Not reported | The DNP education has prepared the APN for process improvement initiatives, providing quality care, and evidence-based practice translation, which are critical with the emerging trends in this complex health care environment |

# Appendix D: The stakeholder interviews

## WP4: INTERVIEW METHODOLOGY

1. Interviews goal description

The aim of interviewing key informants in the frames of webinars or online thematic workshops, round tables - using WP2 webinars and networking events for focus-group interviews and stakeholder engagement was to gather and prioritise the information and elicit stakeholder reactions and suggestions based on the information collected in the written survey of the Delphi study.

2. Outcomes expected from the interviews

Prioritized topics

3. Method

The team (ET; EK; TV and VS) identified the questions from literature screening and EU project screening. These were put in thematic areas to cluster the questions. The team agreed on the questions in a common meeting (3.8.2021). The questions were shared as a Delphi study with the TaSHI Advisory Board (TAB) members, representatives from the pilot sites (16.8) and experts identified by the coordination team. Delphi Survey was sent to TAB and Pilot sites on August 17th and was open until September 3. After the received answers, the answers were clustered into themes, and a prioritization interactive workshop with TAB and Pilot sites was carried out (10.9.2021). This was based on the participants' participation in Mentimeter (menti.com), where we had open discussion around each topic and added topics that we might have missed. The aim of the workshop was to prioritise the information on useful tools, methods and current good practices in task shifting.

4. Questions:

Task shifting in general

1. What kind of task shifting have you experienced?
2. What are the greatest opportunities/facilitators for task shifting?
3. What are the greatest barriers for shifting the tasks?
4. Who works on the pathway and who does what on the pathway?
5. What are the associated cost implications?
6. What are the consequences of task delegation for health outcomes?
7. Can you identify 'optimal' models of care?
8. What are the implications for workforce planning?

Life-long learning and continuous education

1. What life-long learning and continuous professional development/education tools and practices are you aware of?
2. Can you highlight 3 most successful to improve productivity and practice?
3. In your experience, why are these successful tools?

Digital education

1. What is your experience with digital professional education?
2. What is the purpose of the use of the technology?
3. What skills/competences of health and social care professionals are needed?

Automatisation of healthcare

1. Which main workflows are affected by use of technology and what are the new workflows?
2. What arrangements should be made to ensure that a sustainable peer-learning culture will be established after the training?
3. Where, when and how can health and social care professionals be supported in the use of the technology after the training?
4. Are there other workflows that can be improved by the implementation of the new technology?

Promoting task shifting

1. We are preparing a digital curriculum for task shifting. What in your expert opinion is most important to address in such curriculum?
2. How do you think we can promote task shifting across EU MS, health services and life-long learning?

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