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How can skill-mix innovations support the implementation of integrated care for people with chronic conditions and multimorbidity?

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The authors and editors are grateful to the reviewers who commented on this publication and contributed their expertise.

Print ISSN 1997-8065
Web ISSN 1997-8073
Acknowledgements

The authors are grateful to Matthias Wismar and Ewout van Ginneken from the European Observatory on Health Systems and Policies for initiating and steering this work and to Francois Schellevis, Netherlands Institute for Health Services Research, and Toni Dedeu, WHO European Centre for Primary Health Care, for reviewing this Policy Brief and providing very helpful comments.
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Acronyms

ASALEE French acronym for Team Health Project in Private Practice (Action de santé libérale en équipe)
BCL blood cholesterol level
BP blood pressure
CCG Clinical Commissioning Group
CH Switzerland
CKD chronic kidney disease
CNCM community nurse case manager
COPD chronic obstructive pulmonary disease
COVID-19 SARS-Cov-2
CPD continuing professional development
DMP Disease Management Programme
FFS fee for service
FTE full-time equivalent
GP general practitioner
HbA1c glycated haemoglobin
HNCM hospital nurse case manager
IPE interprofessional education
MA medication adherence
NCD noncommunicable diseases
NL The Netherlands
OECD Organisation for Economic Co-operation and Development
RCT Randomized controlled trial
SELFIE 2020 Sustainable integrated care models for multimorbidity: delivery, Financing and performanceE
UK United Kingdom
USA United States of America
WHO World Health Organization
Key messages

- The increasing and changing demands of complex patients (with chronic conditions and multimorbidity), combined with growing workloads and shortages of primary care providers, demand the reorganization of services for more patient-centred and more efficient care.

- Reorganizing health and social care services to integrate care requires that the health workforce adopt “skill-mix changes” including reskilling; a different approach to sharing tasks and roles; and improved coordination.

- Skill mix changes typically involve innovative re-allocation of tasks between professions; new supplementary roles; and/or the introduction of greater teamworking and flexibility.

- The most promising skill-mix innovations for improving integration of care of patients with complex needs are:
  1. **Shifting tasks and roles** to achieve new divisions of work with advanced practitioners (nurses and pharmacists) taking on management of aspects of care and coordinating processes in close collaboration with physicians.
  2. **Relocation of care to other settings** for example to nurse-led clinics or patients’ homes.
  3. **Introduction of (an explicit) care coordination role** with different professionals (case managers, patient navigators) developing shared care plans and monitoring patients’ health and well-being.
  4. **Empowering patients and caregivers** through specialist staff (educators, community health workers) who provide information and training to strengthen patients’ self-management and support behavioural change.
  5. **Introduction of dedicated prevention roles in primary care** with nurses, pharmacists, community health workers or patient navigators fostering health literacy, offering advice and counselling, and promoting healthy lifestyles.
  6. **Establishment of teamwork and collaboration in multi-professional teams** enabling different professions (GPs, specialists, nurses, therapists, social workers, community health workers, housing staff) to work together across sectoral boundaries to organize and coordinate joint care and link health and care services.

- Patient outcomes overall for people with chronic conditions and multimorbidity are positive following skill-mix innovations with (broadly) better adherence and patient engagement but evidence on the impacts on resource use is mixed.

- Policy makers can support the implementation of skill mix reforms and their sustainability (and at the same time foster surge capacities) by:
  - Making changes part of a system-wide process with careful consideration of the macro, meso (organisational) and micro (professional and patient) levels.
  - Taking context into account with close attention to national and local specifics.
  - Introducing adequate regulatory frameworks around (new) professional roles, scope of practice, education and training.
  - Providing sufficient multiannual funding, reimbursement for training and incentives.
  - Addressing the supply of qualified health professionals and joint workforce planning.
  - Coordinating governance structures and leadership and encouraging stakeholder involvement.
  - Monitoring and evaluating to learn lessons.
Executive summary

What do we mean by skill-mix innovations?

Many countries in Europe have started to reorganize the delivery of health and social care services in response to the increasing numbers of patients with chronic conditions and multimorbidity, recognizing the importance of moving away from a fragmented and disease-centred approach to a holistic, patient-centred one. The emerging integrated and coordinated care models often require changes to the skills, competencies, roles or tasks within and across health professionals, subsumed under “skill-mix changes”. These skill-mix changes aim to better meet the increasing and changing demands of patients with complex needs and improve coordination and collaboration between various professionals within the health sector but also across the health and social care sectors. These changes take place in a context of technological advances, new treatment options, growing workloads and shortages of primary care providers. The COVID-19 pandemic has further highlighted the importance of flexibility in the health workforce and the necessity of reskilling and distributing tasks and roles differently. This experience has shown the potential of skill-mix innovations to surge capacities of health systems, and that these are fundamental for implementing new ways of health services provision.

Which skill-mix innovations can improve integrated delivery of care for individuals with chronic conditions and multimorbidity?

This policy brief identified six skill-mix interventions as most promising to tackle current and emerging challenges in primary and ambulatory care and in improving the integration of care of patients with chronic conditions and multimorbidity:

1. Shifting tasks and roles centres on re-allocating tasks and results in a new division of work. Most commonly, nurses or pharmacists in advanced practice roles perform tasks such as management of medication adherence, disease management and patient education that were traditionally provided by physicians or other health professionals. They lead and coordinate the treatment and care process for patients with (multiple) chronic conditions in close collaboration with physicians.

2. Relocation of care to other settings involves moving the provision of chronic care from usual settings (e.g. GP practices, hospitals) to patients’ homes or other outpatient care settings such as nurse-led clinics. Nurse-led clinics are run by nurses under the supervision of physicians and typically focus on chronic disease management. In Sweden, nurse-led heart failure clinics have been widely established. Another example is a nurse-run general practice in London that is operated by nurse practitioners and employs a GP on a sessional basis.

3. Introduction of care coordination roles aims to explicitly improve the coordination of care for patients with chronic diseases. Care coordination roles were established in virtually all European countries under different names such as case managers or transition coordinators, often as part of integrated care models. Care coordination roles may be taken up by different health professions. They usually arrange care and develop shared care plans, often at the intersection of care settings, and monitor patients’ health and well-being.

4. New roles were also implemented with the aim of empowering patients and caregivers. These roles focus on providing information and training to strengthen a patient’s self-management and support behavioural change. They are primarily taken up by nurses, pharmacists or lay health workers with lived experience of the disease. The most known example implemented in many European countries is the role of the peer educator who supports patients with mental illness. Patient navigators and community health workers are also becoming increasingly relevant in providing patient education and assistance in accessing services and support.

5. New dedicated prevention roles in primary care, such as among nurses, pharmacists, community health workers or patient navigators, were introduced to improve health literacy and access to preventive care for patients with (multiple) chronic conditions. They provide general health advice, disease-specific counselling, motivational interviewing and promote a healthy lifestyle to slow the progression of the disease.

6. Establishment of teamwork and collaboration in multi-professional teams is a major skill-mix change and is key for organizing and coordinating health and care services. The most common approaches to facilitating teamwork in chronic care include the introduction of consultation liaison, joint care coordination and shared care. The composition of teams depends on delivery models and care settings. They usually consist of very different professions which may include GPs, specialists, nurses, therapists, social workers, psychotherapists, nutritionists, pharmacists, community health workers and front desk staff as well as housing staff who work together across sectoral boundaries.

What is the evidence on the impact of skill-mix innovations on health outcomes and resource use?

Evidence on skill-mix innovations for patients with single chronic conditions and multimorbidity shows overall positive impact or at least equivalent results on patient outcomes compared to routine care. Many systematic reviews on advanced practice roles of nurses and pharmacists reported improved medication adherence, blood glucose levels and blood pressure control. Reviews on nurse-led clinics also pointed towards better health outcomes, although the majority of results suggest comparable effects. Evidence on care coordinators, peer educators, community health workers and patient navigators indicate that these roles are associated with an improvement in physical health,
adherence to screenings, and patient engagement in treatment and social relationships, although results for patients with mental illness were mixed. Teamwork and collaboration appear to have a moderate impact on physical health but collaborative care in mental health is associated with a positive impact on depressive symptoms and patient satisfaction. Overall, evidence on the impact of skill-mix innovations on resources use is mixed and remains insufficient to draw clear conclusions.

**What are the levers and barriers for implementing skill-mix innovations within integrated care?**

Implementation of skill-mix innovations is most effective when it is part of a system-wide process of integration and involves changes at the system (macro), organizational (meso) and professional and patient level (micro level). Evidence on implementation experiences has revealed various barriers and facilitators for developing skill-mix innovations for integrated care at these three levels. Important levers for successful implementation are regulatory frameworks around (new) professional roles, scope of practice and educational standards and curricula of training. The availability of sufficient and multiannual funding can incentivize or disincentivize the implementation of new roles. For example, reimbursement rates may not be sufficient to cover additional training for professionals to take up new roles. Another major barrier for skill-mix changes at the organizational level is the lack of qualified health professionals and joint workforce planning. Coordinated governance structures, leadership, stakeholder involvement and pre-existing working relationships, as well as sufficient support for implementation, are also key for driving skill-mix innovations within integrated care.

Implementation of skill-mix innovations is highly context-specific, thus recommendations on how changes can be scaled-up and sustained can only be general. However, consideration of the macro, meso and micro context levers and barriers can offer guidance on what key aspects should be taken into account when designing and implementing skill-mix innovations to foster sustained change for more integrated care. Monitoring and evaluation are also central for learning for implementation and policy support.
POLICY BRIEF

1. Introduction: why this brief?

The number of people living with chronic conditions and multimorbidity has steadily increased and is expected to rise further in the coming decades due to population ageing as well as improved medical care and better management of chronic conditions. Patients with chronic conditions and multimorbidity often require coordinated care over an extended period of time (Johnston et al., 2019; Leijten et al., 2018; Nolte & McKee, 2008; Rijken et al., 2017). It is generally acknowledged that current systems of health service provision are not adequate to meet the complex care needs of these patients. Managing patients with chronic conditions and multimorbidity requires the reorganization of care, a holistic, patient-centred approach to care from multiple professionals within the health and social care sectors, and a shift from disease-centred care towards more integrated and coordinated care (Leijten et al., 2018) (see Box 1 for an overview of definitions and conceptual approaches to integrated care). The traditional methods of care delivery that are based on fragmented, disease-based models of care and delivered in solo or small group practices in many countries are becoming increasingly unable to respond to the growing workloads, work intensity and work complexity that stem from the more complex care needs of patients with chronic conditions and multimorbidity.

As a result, new models of care have evolved, centred on collaborative, multi-professional teams, which are increasingly replacing the traditional methods of primary care delivery (Groenewegen et al., 2015; Groenewegen et al., 2021; Kuhlmann et al., 2018; Maier, Williams et al., 2022). These new care models and new ways of working that often come with growing work complexity require skill-mix innovations such as introducing care coordinators, multi-professional teams or nurse-led care as their core element (Busetto et al., 2017a). Health professionals are often the true “integrators” as they are instrumental in providing seamless care that overcomes traditional divisions between health and social care, enabling continuous patient pathways.

These changes all happen in a context of multiple challenges for the health workforce at the health system level, such as shortages and maldistribution, the increasing importance of working with new technologies, and economic pressures.

Box 1. A snapshot on definitions and conceptual approaches to integrated care

Integrated care addresses the increasing burden of chronic diseases and aims to improve patient experiences, health outcomes and to reduce health service costs and utilization. It seeks to overcome service fragmentation, enabling better coordinated and more continuous care (Hujala, Taskinen & Rissanen, 2017; Rijken et al., 2018, 2017; Struckmann et al., 2018). Integrated care is defined as the structured effort to provide coordinated, pro-active, person-centred, multidisciplinary care by two or more well-communicating and collaborating care providers either within the healthcare sector or across the health, social or community care sectors (including informal care) (Leijten et al., 2018).

There are various terms associated with integrated care, such as shared care (UK), transmural care (NL), managed care (USA, CH) or the widely known concepts of comprehensive care and disease management (Kodner & Spreeuwenberg, 2002). Integrated care is often used as an umbrella term. Integration of care can take place at different levels: at the macro- (system integration of primary, secondary and tertiary care), meso- (organization and professional integration based on shared competencies, roles, responsibilities and accountability) and micro-level (clinical, service and personal integration) (Hujala, Taskinen & Rissanen, 2017; Valentijn et al., 2013).

Across Europe and globally, health professional roles are changing or have been newly introduced in terms of skills, competencies and tasks within and across professional and institutional boundaries and are thus at the very centre of integrated care models. The COVID-19 pandemic has highlighted the necessity of having a well-qualified health and care workforce with competencies and flexibility to adapt to changing requirements (Williams et al., 2022). The transfer of tasks between health professionals and closer collaboration across professions and organizations during the pandemic have shown the potential of skill-mix innovations to maintain essential services and provide COVID-19 related services (Sagan et al., 2021). Some important lessons can be taken from experiences with the implementation of skill-mix changes during the pandemic to support health workforce strengthening in the future, including efficient allocation of work, the reduction of bureaucracy and the development of new working cultures to support a more integrated workforce and collaborative, coordinated implementation of healthcare.

Skill-mix innovations are central to implementing new ways of health services provision and scaling-up integrated care approaches. Looman et al. (2021) studied 17 integrated care programmes addressing patients with multimorbidity from eight European countries and identified skill-mix innovations as one key mechanism for the successful implementation of integrated care. Many skill-mix innovations support integration through the introduction of new roles (e.g. care coordinators), while others build on established roles to facilitate integration (Busetto et al., 2017b; Gilburt, 2016; Looman et al., 2021). However, despite promising trends, the wider spread of skill-mix innovations to support integrated care models remains limited across Europe. Few countries have set up legal frameworks and training schemes to allow health professionals to work in new roles and adapt to changing care needs (Winkelmann et al., 2022). This means that – despite some progress – many health systems are not yet sufficiently prepared to deal with the rising number of patients with complex, long-term care needs.
This policy brief provides an overview of the evidence of skill-mix reforms and strategies which are effective in promoting integrated care models in primary care. It also develops policy recommendations on how skill-mix innovations can be achieved and implemented in practice to support integrated care, taking country and system contexts into account. The evidence is taken from the most comprehensive overview conducted in the context, a study by the European Observatory on Health Systems and Policies and Technische Universität Berlin (Maier, Krozen et al., 2022), as well as from a number of innovative programmes identified within the SELFIE project1 (Struckmann et al., 2018) and additional research (Box 2).

Box 2. Methods used to collect the evidence presented in this policy brief

This policy brief uses evidence from a number of sources, primarily a study by the European Observatory on Health Systems and Policies on Skill-mix innovation, effectiveness and implementation (Maier, Krozen et al., 2022).

Section 2 draws on the evidence synthesis on skill-mix changes by Maier, Buddé et al. (2022) and on a cross-country analysis of trends in skill-mix interventions by Winkelmann et al. (2022). Implementation examples used in this section were selected from peer-reviewed and grey literature and evidence collected by the SELFIE project, according to the following criteria:

• supporting integrated care for people with chronic diseases and multimorbidity in primary care,
• involving the most promising skill-mix innovations,
• long-standing experience of implementation providing lessons for other country contexts, and
• evidence on effectiveness, if available.

Section 3 summarizes the research evidence of 78 systematic reviews on the impact of skill-mix interventions for patients with chronic conditions and multimorbidity on individual health outcomes and health system-related outcomes (Winkelmann et al., 2022). Evidence on skill-mix changes for patients with chronic conditions and multimorbidity often focused on the management of single chronic conditions (mainly diabetes, cardiovascular disease and hypertension) with the aim to improve the quality of care, self-management and monitoring (Winkelmann et al., 2022). The interventions were primarily performed by nurses and pharmacists (20 and 18 systematic reviews, respectively), who took up care coordinating roles such as case managers or who were being re-allocated tasks from another health professional (such as nurse-led care) (Winkelmann et al., 2022). A total of 21 reviews analysed the effects of collaborative care and interprofessional teamwork, which mostly dealt with the management of mental health conditions and multimorbidity. Most reviews involving multi-professional teams evaluated consultation liaison, care coordination, shared care or case management involving various professionals (primary care physicians, specialists, nurse care coordinators, social workers, pharmacists, psychologists). Many skill-mix changes, however, were multifactorial interventions using a collaborative care approach that included a case manager (nurse or pharmacist) supported by primary care teams, set up care planning, collaborative goal setting, patient education and follow up. Almost all reviews reported on health outcomes, but few studies assessed other outcome measures such as cost-effectiveness, health care utilization or patient and staff satisfaction (Winkelmann et al., 2022). The majority of original studies were conducted in the USA, the United Kingdom, Australia and Canada. The Netherlands and Spain were the most represented European countries after the United Kingdom in terms of original studies, with a small number from Sweden, Belgium, Denmark, France, Ireland, Austria and Switzerland.

Section 4 draws from the Observatory volume chapter 3 ("Implementing skill-mix changes: lessons for policy and practice") which analyses 29 systematic reviews on implementation plus additional evidence (Maier, Scarpetti et al., 2022) and from Chapter 10 ("Implementing skill-mix innovations: role of policy and financing") which analysed seven studies (Scarpetti et al., 2022). Based on these findings, the policy brief develops an implementation roadmap for policy-makers on how to choose and implement skill-mix innovations.

The overall question addressed in this brief is: How can skill-mix innovations support the implementation of integrated care for people with chronic conditions and multimorbidity?

Section 2 looks at the various types of skill-mix innovation and investigate which ones have the potential to improve integrated care for individuals with chronic conditions and multimorbidity. Section 3 summarizes what is known about the impact of skill-mix innovations on health outcomes and resource use. The brief then highlights key levers and barriers for implementing skill-mix innovations within integrated care (Section 4) and offers conclusions in Section 5.

1 SELFIE (Sustainable intEgrated chronic care models for multi-morbidity: delivery, Financing, and performancE) is a Horizon2020-funded EU project that aims to contribute to the improvement of person-centred care for persons with multimorbidity by proposing evidence-based, economically sustainable, integrated care programmes that stimulate cooperation across health and social care and are supported by appropriate financing and payment schemes.
How can skill-mix innovations support the implementation of integrated care for people with chronic conditions and multimorbidity?

Various skill-mix reforms have been pursued by many countries to support the provision of coordinated and continuous care. Examples include countries which have expanded the scope of practice and skills of established health and care professionals, such as nurses or pharmacists, reoriented professions such as paramedics or social workers who traditionally worked elsewhere in the health system into primary care settings, delegated tasks to lay health workers (peer workers), or introduced new professions such as physician assistants.

What different types of skill-mix innovation exist?

Skill-mix innovations can be defined as changes to the skills, competencies, roles or tasks within and across health professionals (with a formal education in health) and lay health workers (including community-based workers, peers, informal caregivers) and/or teams involving at least two professions. Skills-mix innovations are new and disruptive in nature (defined as discontinuous with current practice) within their specific contexts and aim at improving at least one health outcome with positive effects on access, quality, patient experience, coordination of care and/or costs (Greenhalgh et al., 2004; Maier, Williams et al., 2022).

Various types or models of skill-mix change exist. In an overview of systematic reviews by Maier, Budde et al. (2022), six different skill-mix innovations were identified as being promising in terms of tackling current and emerging challenges in primary and ambulatory care and in improving the integration of care of patients with chronic conditions and multimorbidity:

1. Shifting tasks and roles,
2. Relocation of care to other settings, e.g. to nurse-led clinics,
3. Introduction of care coordination roles,
4. Empowering patients and caregivers through new roles,
5. Introduction of dedicated prevention roles in primary care, and

All of these six skill-mix innovations can be subsumed under three main categories, which are task re-allocation, task supplementation, and teamwork and collaboration (Maier, Budde et al., 2022; Laurant et al., 2005; Friedman et al., 2014) (Table 1).

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Source: Maier, Budde et al., 2022
The first category of skill-mix innovations refers to **re-allocation of tasks** or a new division of work and responsibilities between at least two professions (e.g. physicians, nurses, pharmacists and other providers). The term **task shifting**, or sometimes task sharing (also referred to as substitution or delegation), is also commonly used. While substitution refers to tasks being entirely shifted to a new profession, delegation is frequently referred to as the transfer of tasks from higher to lower educated professions, e.g. from physicians to nurses or pharmacists, but with physicians maintaining ultimate responsibility (Laurant et al., 2005; Sibbald, Shen & McBride, 2004; Maier, Williams et al., 2022). The objective of these interventions is to share tasks more efficiently and to support the delivery of holistic, patient-centred care across settings. A common feature of task re-allocation is the ability to work autonomously and at a higher level of practice. Task shifting may also reduce the workload of certain professionals (e.g. GPs), allowing them to devote more time and attention to patients. **(1) Shifting tasks and roles** leading to advanced practice roles is the most prominent example of task re-allocation with tasks taken up for instance by nurses and pharmacists with an expanded scope of practice. In care for patients with chronic conditions and multimorbidity, an important model is nurse-led care in which nurses lead and coordinate the treatment and care process for patients with chronic conditions. They take over tasks that were previously performed by physicians, such as medication review, prescribing of medicines, management of medication adherence, disease management and patient education (Maier, Budde et al., 2022). In Europe task shifting in primary care from GPs to nurses was first introduced in the UK and in the Netherlands in the 1980s and has since then expanded in various care areas (e.g. mental health nurses in the Netherlands). In contrast, other European countries such as Belgium or Germany still rely primarily on solo practices with very limited task shifting (Groenewegen et al., 2021). **(2) Relocation of care to new settings** involves the movement of chronic care from the usual settings (e.g. GP practices, hospitals) to the patient’s home or other outpatient care settings such as nurse-led clinics. It aims to improve patient-centredness and efficiency of chronic care by bringing service delivery closer to the patient and reducing the complexity of the care setting (Maier, Budde et al., 2022).

The second category concerns the addition of new tasks or roles through the introduction of **new, supplementary roles**. These new roles or new professions have been introduced to explicitly improve the coordination of care, either as stand-alone models or programmes or embedded within broader strategies to foster coordination of care and improve quality of care and health outcomes. Adapted from Laurant et al. (2005), this category refers to health professionals expanding their roles or introducing new professions and performing new functions that were previously not at all or not routinely performed. Hence, this typology refers to expansion of the skills set and existing roles of an individual and the team (Maier, Budde et al., 2022). Two models emerged: new roles either at the interface of the hospital and ambulatory care sector, often as a one-off activity, or along the patient pathway, as a supporting and coordinating role over a longer period of time. The most prominent example is the **(3) Introduction of care coordination roles**, including case managers and transition coordinators, having integration as their core responsibility, which was primarily implemented to improve care for patients with chronic diseases. Another example is **(4) Empowering patients and caregivers through new roles** that aim to provide information and training to patients and caregivers to strengthen the self-management and health literacy of patients supporting behaviour change. Moreover, the **(5) Introduction of dedicated prevention roles in primary care** was brought in in some countries to improve health literacy and access to preventive care for patients with (multiple) chronic conditions.

Finally, the third category covers the **(6) Establishment of teamwork and collaboration in multi-professional teams**. The term teamwork refers to changes of collaboration between at least two professions or more, for instance shared care among physicians and nurses, psychologists, physiotherapists, pharmacists, other healthcare professionals and also social workers, among others. Team collaboration occurs across professional boundaries beyond the health sector, based on the concepts of sharing, partnership, interdependency and power. Multi-professional collaboration brings together the expertise and skills of different professionals to assess, plan and manage care jointly with patient-centredness being one of the most important goals connecting the care professionals. Models of multi-professional team-based care can also span across sectoral boundaries, most often primary and secondary care levels but also tertiary care. Several collaborative care models have proliferated in integrated care networks and Disease Management Programmes (DMPs) (Noélte & McKee, 2008).

Many skill-mix innovations are multifactorial interventions using different combinations within new care models and strategies, such as collaborative care approaches and case managers who support primary care teams, set up care planning, collaborative goal setting, patient education and follow up. Other skill-mix innovations that are frequently implemented in combination are nurse or pharmacist-led care within multi-professional teams, and involvement of a case manager role, as well as regular team meetings to discuss a patient’s treatment (Winkelmann et al., 2022).

**What are the key examples of existing skill-mix innovations supporting integration of care?**

In the remainder of this section, we describe implementation examples of the six different types of skill-mix innovation that support integrated care for patients with chronic conditions and multimorbidity within different policy and country contexts.

**Skill-mix innovation type 1: Shifting tasks and roles**

**Advanced practice roles** that have been introduced with the aim to support integrated care often involve specialized health professionals, primarily nurses or pharmacists, who manage chronic conditions in primary care settings.
Nurse-led care covers a wide range of activities such as patient assessment, diagnosis, disease management, education, management of medication adherence or prescribing of medicines (Maier, Budde et al., 2022). Nurses in advanced practice roles (e.g. Advanced Practice Nurses) often work in close collaboration with physicians, under varying levels of physician oversight. Several country examples exist, e.g. in Finland, France and Slovenia. The new model practices with enhanced roles for nurses in Slovenia and the extended roles for nurses in France and Finland are examples of advanced practice roles for nurses in the care of people with chronic conditions and multimorbidity that have been shown to support the integration of care (Box 3).

Box 3. Fostering integration of general practice services through advanced nursing roles in Finland, France and Slovenia

**Extended roles for nurses in Finland**

The role of nurses has been largely expanded in Finland, in particular in the care of chronic patients. In public health centres, where the majority of primary care services are provided, registered nurses with additional education have much autonomy and are responsible for the management of patients with chronic conditions. This involves taking care of the care process, prescribing medicines and issuing referrals to diagnostic tests. They usually draw up the patient's treatment plan together with the GP and cooperate with the physician if needed. In large health centres multi-professional teams have been created to provide care tailored to each patient's needs (Ilmo Keskimäki, Hepoinen & Sinervo, 2018; Vehko et al., 2017). Moreover, nurses increasingly provide telephone consultations. In 2018 nurse consultations covered about half of the total number of non-urgent outpatient visits provided by Finnish health centres. In several health centres the adoption of nurse consultations and enhanced roles for nurses have improved access to health services (Keskimäki et al., 2019). The advanced roles for nurses in healthcare were introduced in the early 2000s in Finland. New postgraduate or Master's-level programmes and postgraduate diploma training allowed nurses to extend their role to carry out, for example, nurse consultations, nurse prescribing of medicines for patients with certain chronic conditions, referrals to diagnostic tests and the management of a range of acute and chronic conditions.

**New nursing roles for the improved management of chronic care in France**

The ASALEE (Team Health Project in Private Practice) programme which was initiated in 2004 in one region in Western France due to a GP shortage in rural areas builds on cooperation between GPs and nurses to diagnose and manage patients with diabetes and other chronic diseases. New nursing roles were introduced to manage chronic diseases, including cardiovascular risk management, COPD and dementia screening (Bourguil, 2018). Nurses are in charge of patient counselling, a task previously performed by GPs, but they continue to closely communicate with the GPs on the follow up. This pair-working facilitates the organization of screening, therapeutic education and follow up. The nurses are salaried by the programme and collaborate closely with two or three independently practising GPs (IRDES, 2018). An assessment in 2019 showed that more than 3000 general practitioners and 700 nurses participated in the ASALEE model (Afrite, Franc & Mousques, 2019). The project was expanded to all regions in 2012. An analysis of the impact of the ASALEE model has shown an increased productivity of GPs closely collaborating with nurses, with the number of patients seen by GPs increasing by nearly 8% (Loussouarn et al., 2019).

The COVID-19 pandemic has accelerated skill-mix changes in several countries with nurses working in expanded roles in the care of patients with chronic conditions as well as in the care of patients with COVID-19. In some Spanish regions, such as Catalonia and Castile and Leon, nurses gained a higher degree of autonomy with tasks being shifted from physicians to nurses, while at the same time teamwork was strengthened (Martí, Peris & Cerezo, 2021) (Box 4).

**New model practice in Slovenia with enhanced roles for nurses**

In 2011 the government of Slovenia introduced a new approach to the management of chronic patients and populations at risk of developing noncommunicable diseases (NCDs) at the primary care level with the goal of improving care for chronic patients and reducing the care burden on GPs. The new approach, called the “family medicine model practice”, supplemented each general practice core team with a 0.5 full-time equivalent (FTE) registered nurse who had received additional training in prevention of NCDs. These nurses took on a larger role in the management of chronic patients, which included regular assessment of the condition, ensuring continuity of treatment, supporting patients with health-related problems such as lifestyle risks and providing regular health advice and follow up. GPs and nurses spend at least three hours per week together coordinating their work. The model is supported by a new payment model and around three out of four family medicine practices had adopted it by 2021 (Albreht et al., 2021). During the COVID-19 pandemic the model proved advantageous for the maintenance of essential services for priority conditions such as the follow up of patients with chronic conditions. Overall, multi-professional teams within community health centres were key both for COVID-19 management (testing, rehabilitation for post-COVID conditions, etc.) and chronic disease management (Vracho, Petric & Borgermans, 2021).

**New model practice in Slovenia with enhanced roles for nurses**

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**Box 4. Broadening the scope of practice of nurses accelerated during the COVID-19 pandemic in Spain**

In the rural region of Castile and Leon in Spain primary care started to be reorganized from 2020 with the aim to promote teamwork and professional development of primary care professionals, focusing on nurses and administrative staff. Administrative tasks were shifted from family doctors and nurses to administrative staff, who were supported by mHealth applications. The role of nurses was expanded prior to the pandemic and they were already in charge of the follow up of patients with complex chronic conditions and multimorbidity. During the pandemic their role was further broadened, with nurses assuming responsibility for delivering face-to-face and home visits to patients who needed to be prioritized to obtain treatment, and nurse prescribing was approved by the regional government. Tasks such as epidemiological surveillance, contact tracing and coordination of COVID-19 immunizations were also shifted to the nurses during the pandemic, further strengthening their role in primary care (Martí, Peris & Cerezo, 2021).

*mHealth is a subset of eHealth that is linked to mobile telephony and applications.*
Community pharmacists are also increasingly taking up advanced practice roles in the care of chronic patients in some countries, such as England and the Netherlands (Claire, Claire & Matthew, 2021; Hazen et al., 2021). As community-based healthcare providers, they are well positioned to take over tasks previously carried out by primary care physicians, such as patient counselling, monitoring of medication adherence, and measurement and testing of clinical parameters (Maier, Budde et al., 2022; Winkelmann et al., 2022). The introduction of the new specialization of clinical pharmacist in England shows how tasks previously performed by GPs can be shifted to pharmacists to improve quality and efficiency of care for chronic patients and to broaden access to medicine consultations (Box 5).

Box 5. Advanced pharmacist roles in general practice in England
Clinical pharmacist is a distinct role that was introduced in England in 2015 as part of a pilot scheme that included 490 pharmacists and 658 GP practices. Clinical pharmacists are hired to work in general practice teams and consult patients directly to help manage long-term conditions and provide medication reviews to enhance access to health checks. An evaluation of the pilot phase showed that clinical pharmacists helped increase the capacity of GPs and the volume of patient appointments. In particular, clinical pharmacists provided medicine education and advice to patients with long-term conditions, which helped increase understanding and medication adherence; in some cases, prescribing errors and patient readmission post discharge were reduced, with the potential to lead to cost savings and improved safety (Mann et al., 2018).

Since the successful pilot, clinical pharmacists have become an established role within GP practices. All GP practices working within a Primary Care Network (groups of GP practices and other health providers that work together within a geographic area) are eligible to receive funding to employ clinical pharmacists as part of the five-year GP contract framework reform. Clinical pharmacists hired after 1 July 2019 are reimbursed at 70% of employment costs (NHS England, 2020a).

Skill-mix innovation type 2: Relocating care to other settings
Relocation of care to other settings includes shifting of care to nurse-led clinics in which nurses deliver care in ambulatory care settings autonomously without supervision by physicians. Nurse-led clinics typically focus on chronic disease management where continuous follow-up of patients’ conditions is required. They thus play an important role in secondary prevention by providing patient education and development of care plans together with patients to better manage their conditions. In Iceland, for example, nurse-led ambulatory clinics have been set up for patients with lung problems, for children and adolescents with diabetes, and for pre-dialysis patients (OECD/European Observatory on Health Systems and Policies, 2019). In Sweden nurse-led heart failure clinics have shown they are effective in reducing hospitalization, patient education on self-care, psychosocial support to patients and their family, and independently perform physical examination and assess mental well-being. Nurses also optimize doses of medications and occasionally prescribe new treatments with co-signatures by the responsible physician. Overall, nurses work in close collaboration with the physician, who may take a medical decision if needed (Savarese et al., 2019). Evaluation of nurse-led heart failure clinics has shown they are effective in reducing hospitalization in terms of admissions, length of stay and ED visits (see also Section 3). Moreover, quality of treatment and patient satisfaction improved (Lijeroos & Strömberg, 2019).

Box 6. Nurse-led clinics as an example of relocating care to new settings in England and Sweden

Nurse-led general care practice in London, England
The Cuckoo Lane Practice in Ealing, London is a nurse-run general practice opened in 2014. It is operated by nurse practitioners who are in charge of all clinical tasks and management. Three practice nurses provide care in the clinic in addition to a GP employed on a sessional basis, often for approximately three–four hours every day; two healthcare assistants and practice administrators provide administrative support. The clinic provides a range of services including care for patients with chronic disease and multimorbidity, such as heart disease and hypertension management, diabetes management, warfarin monitoring and inhaler/asthma/lung function clinics. All staff working in the Cuckoo Lane Practice meet twice a day to discuss variations of clinical and operational practice, to provide updates on current matters, and to ensure coherent communication with the patients (Bhardwa, 2014; NHS England, 2018).

Nurse-led heart failure clinics in Sweden
In Sweden nurse-led clinics provide coordinated disease management for patients with heart failure who require care from multiple disciplines. They are mostly located in hospitals and are led by specialist nurses. Nurses provide rapid follow-up care after hospitalization, patient education on self-care, psychosocial support to patients and their family, and independently perform physical examination and assess mental well-being. Nurses also optimize doses of medications and occasionally prescribe new treatments with co-signatures by the responsible physician. Overall, nurses work in close collaboration with the physician, who may take a medical decision if needed (Savarese et al., 2019). Evaluation of nurse-led heart failure clinics has shown they are effective in reducing hospitalization in terms of admissions, length of stay and ED visits (see also Section 3). Moreover, quality of treatment and patient satisfaction improved (Lijeroos & Strömberg, 2019).

Skill-mix innovation type 3: Introduction of care coordination roles
Care coordinators were mainly introduced to improve the coordination of care for patients with chronic diseases. Coordinator roles have been established in virtually all European countries; however, the terms used (e.g. case manager, transitional care coordinator) and professions working in these roles vary considerably. They arrange care and develop shared care plans and monitor patients’ health and well-being. They thereby support patients in planning, organizing and accessing care and linking resources and providers through a patient-centred approach (Winkelmann et al., 2022).

The most prominent example of care coordinators are case managers for patients with chronic conditions and multiple care needs. They focus on managing an individual patient through a set of activities concerned with providing proactive, planned, preventive care and supporting patients with self-management and development of self-efficacy skills. The roles are mostly performed by nurses as well as pharmacists who may perform clinical needs assessments and clinical monitoring. Examples of a case management role are the Casaplus programme in Germany and the Proactive Primary Care Approach for Frail Elderly (U-PROFIT) in the Netherlands.
Both programmes created the new role of case managers specifically to deliver integrated care for older people with multimorbidity and long-term care needs (Box 7).

**Box 7. Introduction of case managers for patients with multimorbidity in Germany and the Netherlands**

**New and supplementary tasks and roles in integrated care in Germany**

Casaplus is a case management programme that aims to reorganize and create low-threshold healthcare services for elderly people with multiple chronic diseases to reduce preventable hospitalization and reduce related healthcare expenditure. Casaplus relies on case managers who are experienced nurses who inform, advise, support on self-management and lifestyle modification and assess the possible risks of falls and malnutrition, as well as social risks. They coordinate clients’ health and social care using a sophisticated data support and communication system. GPs, specialists, psychologists, pharmacists and case managers at the participating sickness funds and informal carers are consulted if necessary (SELFIE, 2016). Case managers receive two years’ extensive training within a specialized study programme at a university. The case management programme continues to be offered by several statutory and private health insurance funds throughout Germany.

**Nurse-led intervention to improve care coordination in the Netherlands**

The Proactive Primary Care Approach for Frail Elderly (U-PROFIT, The Netherlands) is a nurse-led intervention for frail elderly (>60) living at home with the aim to enhance transition of care from reactive to proactive elderly care, to preserve daily functioning, improve quality of care and health, and to reduce costs. Elderly care nurse is a new professional role filled by GP practice nurses and district nurses who have received special training and act as case managers and care coordinators. Elderly care nurses are responsible within the primary care centres for planning, organizing and executing the care for frail elderly patients. They are trained in thirteen evidence-based care pathways upon indication: falls and mobility, physical functioning, nutrition and malnutrition, mood and depression, loneliness, cognition, incontinence, polypharmacy, vision impairment, hearing loss, caregiver burden, pain and sleep. Regular team meetings are held between the elderly care nurse, the district nurse, and the elderly care physician (SELFIE, 2016). The intervention was evaluated by an RCT in 2011/2012 which showed a statistically significant but small effect of daily functioning of participants but no effect on quality of life, hospital admissions and emergency department visits (Bleijenberg et al., 2016).

New roles focusing on care transitions, specifically from hospital to ambulatory care, are mostly referred to as transition coordinators, navigators or various terms related to discharge management. These roles are central for patients with often severe or multiple conditions who are close to discharge and they are aimed at improving the continuity of care from hospital to care delivered at home. One example is the dual case manager model in the Spanish region of Valencia in 2007 with the aim to increase cooperation between primary and hospital care and improve transitional care for highly complex home-care patients, and to enable them to remain at home. Two new nursing roles were introduced as part of the integrated care model: the community nurse case manager (CNCM), responsible for arranging care at home and mobilizing the community-based collaborative care process, and the hospital nurse case manager (HNCM), responsible for identifying highly complex chronic patients and for planning discharge. A multi-professional team designs individual care plans with the support of the CNCM. Both the CNCM and the HNCM are then jointly responsible for monitoring the patient, interacting with primary care teams and ensuring continuity of care. The communication between and work of the CNCM and HNCM and the identification of high-risk patients is facilitated by the use of information and communication technologies. CNCMs and HNCMs are required to attend 100 hours of specific training and one month on-the-job training. Other professionals receive ongoing training related to integrated care and care for complex cases (Winkelmann et al., 2022; Barbabella et al., 2015; Gallud, Soler & Cuevas, 2012).

**Box 8. Introduction of case managers to improve transition of care in Valencia, Spain**

A dual case manager model was implemented as a pilot initiative in the Spanish region of Valencia in 2007 with the aim to increase cooperation between primary and hospital care and improve transitional care for highly complex home-care patients, and to enable them to remain at home. Two new nursing roles were introduced as part of the integrated care model: the community nurse case manager (CNCM), responsible for arranging care at home and mobilizing the community-based collaborative care process, and the hospital nurse case manager (HNCM), responsible for identifying highly complex chronic patients and for planning discharge. A multi-professional team designs individual care plans with the support of the CNCM. Both the CNCM and the HNCM are then jointly responsible for monitoring the patient, interacting with primary care teams and ensuring continuity of care. The communication between and work of the CNCM and HNCM and the identification of high-risk patients is facilitated by the use of information and communication technologies. CNCMs and HNCMs are required to attend 100 hours of specific training and one month on-the-job training. Other professionals receive ongoing training related to integrated care and care for complex cases (Winkelmann et al., 2022; Barbabella et al., 2015; Gallud, Soler & Cuevas, 2012).

**Skill-mix innovation type 4: Empowering patients and caregivers through new roles**

Empowering chronic patients and their caregivers through new roles aims to support autonomy and capacities to manage the disease and coordinate the care on their own. These new roles are primarily taken up by nurses, pharmacists or peers who provide educational activities, motivational coaching, telephone-based consultations and self-management skills training. One prominent example is peer educators, who may also be part of multidisciplinary teams and integrated care settings. Peer educators are most often patients with the same chronic conditions and the same lived experiences (Siantz, Henwood & Gilmer, 2016). Specific training programmes prepare peer educators in health education, covering skills in communication and the use and presentation of educational materials (Dehghani, 2021; Merle et al., 2022). They support individual patients or patient groups to adopt necessary behaviour and lifestyle changes (e.g. physical activity, nutritional habits) and to effectively use tools (e.g. medication, medical devices, apps, online programmes) and other community resources (e.g. sport groups, patient meetings, etc.) to better cope with their disease. The overall aim of peer educators is to provide social support, raise awareness and knowledge on management of the disease or details on procedures and to thereby improve patient-centredness, continuity and proactiveness of care. Education by peers has been shown to improve patients’ health literacy and to provide relief and assurance to patients to overcome their disease (Dehghani, 2021) (see also Section 3).

In the area of mental health, peer support is relatively well developed and implemented in the USA and many European countries, e.g. Austria, Belgium, Germany, Hungary, the Netherlands, Slovenia, Sweden, the UK and Switzerland, with sometimes accredited peer educator training (Gamian
Europe, 2020; Valenstein & Pfeiffer, 2018). Peer educators in mental health are former patients who have experienced mental illness and are recovered. In Switzerland peer educators are well established to support people with severe acute or chronic mental illness. Also, in France a formal education for peer educators in the area of mental health has been established, with training provided to patients in remission who then support mental health teams themselves (Box 9).

Box 9. Peer support for patients with mental illness in France and Switzerland

Peer health mediators in France

The new professional role of the peer health mediator (‘Médiateur de santé pairs’) was implemented as a pilot programme in 2011 by the French World Health Organization Collaborating Centre for Research and Training in Mental Health (WHOCC Lille) and since then has developed into a recognized profession. The peer health mediators are former psychiatric services users in mental health services who are employed in various settings, such as psychiatric (hospital) services and social insertion programmes in day centres. The skills of these new professionals are based on their experiential knowledge with mental illness, treatment and recovery. Their activities include face-to-face interviews with patients, home visits, facilitating discussion groups, and running therapeutic workshop and education sessions. Their mission is to promote access to care and to support patients with mental illness to maintain their relations to the social, emotional and professional environment by providing, for example, support in administrative tasks or participation in cultural activities (Niard, Maugiron & Franc, 2020; Staedel & Hude, 2020; Villani & Kovess-Masféty, 2018). Evaluations of peer mediator programmes have shown a positive impact on recovery and the development of empowerment (Demaily et al., 2014). Since 2018 formal training programmes for peer health mediators have been in place in France facilitating the development of skills and the professionalism of this new role in the context of integrated care (Staedel & Hude, 2020).

Peers with psychiatric experience in mental care in Switzerland

In Switzerland peer educators receive training to reflect their experience and to use their experiences to work with patients, but also in research and quality assurance. Peer experts share their experiences with other affected persons, their relatives and health professionals. Once they have finalized their training, they might work in outpatient and outreach psychiatric services, in day centres, housing and employment services, counselling centres or psychiatric clinics. They lead or set up self-help or recovery groups and build bridges between patients and professionals. They provide counselling on their personal recovery path, on self-help and possible offers, and on psychiatric disorders or illnesses, and they assist patients in how to deal with medication or how to establish and maintain contacts and relationships (Burr et al., 2021; pro mente sana, 2020). A recent survey among peer experts revealed that in outpatient settings integration into the multi-professional teams and lack of communication with professionals and other peer experts were perceived as the greatest challenges in peer support work (Burr et al., 2020).

Other examples of skill-mix changes that empower chronic patients and their caregivers are patient navigators and community health workers (or community health advisers) (for more information on patient navigators please see the Observatory Policy Brief by Budde et al., 2022). They are lay or lower trained health professionals and focus on education and navigation assistance, usually collaborating with other health professionals, sometimes within primary care teams. Community health workers often focus on chronic disease management and disease prevention (see also skill-mix type 5 below and in Table 1) and target vulnerable patient groups such as ethnic minorities, social welfare recipients, etc. Community health workers usually provide health education, preventive health screenings and chronic disease management interventions, while patient navigators educate patients and link patients with different care providers (Budde et al., 2022). Navigators and health workers often have a background from the community they serve, with an intimate knowledge of and network in the community which allows them to provide tangible support. Community health workers can be primarily found in the USA and low- and middle-income countries, but are receiving increased attention in European countries (Ingram et al., 2017; Pantoja et al., 2022; Werfalli et al., 2020).

Patient navigators and community health advisers play a central role in social prescribing, a concept that has been receiving attention in the last years as a holistic approach to meet the emotional, practical and social needs of people, also in line with a shift from inpatient to community care. Box 10 describes the new role of the social prescribing workers who are at the centre of social prescribing schemes in England.

Box 10. Introduction of social prescribing in England

Social prescribing (also known as community referral) is a scheme that connects people to a variety of local, non-clinical services. Social prescribing has gained popularity in the UK, and is included in the NHS England Long-Term Plan with measurable goals. Social prescribing aims to provide holistic support to people who may have long-term health conditions, who need mental health support, or who are lonely and in need of emotional or practical support (NHS England, 2020b). Health and social care professionals such as GPs, nurses and social workers, but also local agencies (e.g., job centres) can refer people to a link worker, who acts as a bridge between the medical and community services. Most social prescribing schemes involve social prescribing workers (other terms used are health advisers and navigators) who work together with the patients and propose an individualized plan to address their needs. They help patients to find local services and activities that offer practical, social and emotional support to improve their health and well-being. These can cover financial advice services, arts workshops, gardening, healthy eating advice, sports and group learning (Buck & Ewbank, 2020; NHS England, 2020b). Increasing evidence highlights that social prescribing can lead to positive health and well-being outcomes. Patients have reported improvements in quality of life, as well as in mental and general well-being and depression/anxiety. However, further research is needed to strengthen the evidence base and clarify the cost-effectiveness of social prescribing schemes (Buck & Ewbank, 2020).

Skill-mix innovation type 5: Introduction of dedicated prevention roles in primary care

Dedicated prevention roles are new, supplementary roles in primary care that aim to improve access to health promotion and prevention for patients with chronic conditions. These
How can skill-mix innovations support the implementation of integrated care for people with chronic conditions and multimorbidity?

new roles are taken up by various professionals such as GPs, physicians, nurses, community pharmacists, dietitians, community health workers, lay workers, social workers and physiotherapists. They provide disease-specific counselling, health advice and motivational interviewing (Maier, Budde et al., 2022) and promote a healthy lifestyle, participation in screening, smoking cessation, and diet and exercise programmes to slow the progression of the disease. The overall aim is to improve health literacy and to support self-management. A prominent example of such new dedicated prevention roles is patient navigators who help patients access health services and provide counselling on preventive activities, such as the Cardiolotse programme that targets patients with chronic heart diseases (Box 11) (see also the complementary Policy Brief on patient navigators by Budde et al. (2022)).

**Box 11. Patient navigators in secondary and tertiary heart disease prevention in Germany**

In 2018 the patient navigator pilot programme ‘Cardiolotse’ was introduced in Berlin. It targets patients admitted to hospital due to (chronic) heart diseases such as cardiac arrhythmia, heart attack and heart failure. These navigators, called ‘Cardiolotse’, assist patients during the transition from inpatient to ambulatory care for at least one year after discharge. They provide individual counselling on nutrition, exercise or smoking cessation. They arrange training tailored to the patient and guide the patients through ambulatory follow-up care and rehabilitation. The overall aim of the navigator is to reduce readmission to hospitals, improve health outcomes and quality of life of patients. Medical assistants with two years of medical training can become Cardiolotse after passing a two-month training programme. Early evaluation of the pilot programme showed that a reduction of hospital readmission rates by up to 5% were possible. In May 2021 the participating health insurance fund and eight hospitals in Berlin entered a selective contracting arrangement for integrated care which allows the programme to be sustained (Ärztzezeitung, 2021; Cardiolotse, 2021).

**Skill-mix innovation type 6: Establishment of teamwork and collaboration in multi-professional teams**

Multi-professional teamwork is a major skill-mix change and at the same time one key determinant of integrated care for organizing and coordinating health and care services to improve coordination and quality of care and to meet the needs of individuals with complex care needs. Changes to teamwork and multi-professional collaboration are in particular introduced for patients with chronic conditions with the aim to create closer relationships between primary care (GPs, family doctors, nurses) and specialists. The most common ways of fostering teamwork in chronic care are through consultation liaison, joint care coordination and shared care by various professionals (Maier, Budde et al., 2022), while team-based care for people with multimorbidity mainly comprises intersectoral coordination and collaboration between primary and secondary providers (Winkelmann et al., 2022).

Multi-professional collaboration has increasingly been introduced in many European countries to overcome the limitations of uni-professional practices and benefit from interprofessional teamwork and multi-professional competencies. The composition of teams depends on delivery models and care settings. They usually consist of very different professions which may include GPs, specialists, nurses, therapists, social workers, psychotherapists, nutritionists, pharmacists, community health workers and front desk staff as well as housing staff. With these multiple professionals being involved, they bring together a broad range of skills and expertise and can thus offer a comprehensive set of services which allows holistic, person-centred and coordinated care and support.

Examples of multi-professional teamwork are disease management programmes with multi-professional approaches such as the transitional care teams for early discharge planning of the Salford Together Programme (see Box 12, and the complementary Policy Brief on patient navigators by Budde et al. (2022)). This transitional care team plans and coordinates the care of complex cases across the continuum of care with the aim to improve collaboration between professionals and reinforce their motivation (Loomann et al., 2021).

**Box 12. Multi-professional collaboration and teamwork in England**

The Salford Together Programme is a partnership between communities, social care and healthcare providers that aims to bring together the services of GPs, nursing, social care, mental health care, community-based services and voluntary organizations into a joint system of needs-based care. It was introduced in 2016 and targets older patients with multiple chronic conditions with the aim to provide more integrated care services and reduce hospital admissions. The Salford Together Programme has established new ways of professional working, especially through multi-professional health and social care groups that involve professionals from about 10 different disciplines (GPs, practice managers, practice nurses, social workers, hospital specialists, mental health professionals, district nurses and staff from the local authority), although the skill-mix of professionals attending the meetings is variable. They meet regularly to identify at-risk people above 65 in the neighbourhood and plan interventions, using shared care protocols that are agreed between all members. An integrated care plan is then developed together with the individuals (SELFIE Report UK). Evaluation of the Salford Together Programme reveals a greater reduction in emergency department attendances compared to fifteen Clinical Commissioning Group (CCG) boroughs in England, but a direct causal relationship could not be established (McDonach & Lavin, 2020).

Multi-professional teams are increasingly implemented in routine care for the treatment of mental health conditions. Countries such as Denmark, Belgium, Ireland, Italy and the UK are prioritizing community-based multi-professional care in mental health (Winkelmann et al., 2022). They may intervene at different stages of the disease. There are, for example, early intervention teams, community mental health teams and crisis teams. In the Czech Republic multi-professional mental health teams work in psychiatric hospitals, social services and the newly introduced mental health centres (Box 13).
Box 13. Collaborative care in mental health care in the Czech Republic

In the Czech Republic mental health care is seeing a major transformation with the introduction of multi-professional teams in psychiatric hospitals and social services and in newly created mental health centres. One of the objectives of the mental health care reform in 2013 in the Czech Republic was to shift care from psychiatric hospitals to community settings and to improve the linkage between healthcare and social services. The mental health centres, first piloted in 2017, are based on multi-professional teams comprising psychiatric nurses, social workers, psychiatrists and psychologists who provide mobile case management services, crisis interventions, day care services, and out-patient psychiatric and psychological care. The team also closely collaborates with general practices, local government, social services and the police. The composition of multi-professional teams is based on the individual needs of service users. During the COVID-19 pandemic, the 30 mental health centres proved essential for early discharge of long-stay patients and increased cooperation with outpatient psychiatrists. As part of the mental health care reform, multi-professional teams are also set up in psychiatric hospitals and social services (Broulikova, Dlouhy & Winkler, 2019; Svačina et al., 2021).

Multi-professional teams are also widely implemented in palliative care for people with a progressive life-threatening illness and/or for their (in)formal caregivers. The involvement of multi-professional palliative care teams has shown a positive impact on health system-related outcomes such as better symptom control, lower caregiver burden and fewer hospital admissions (Siouta et al., 2016). Palliative care teams were introduced in many European countries, including Germany (Box 14), to enable patients with time-limiting, non-curable and progressive diagnoses and complex symptoms to stay at home for as long as possible and to die in their preferred place (Centeno et al., 2013). Multi-professional teamwork is an important facilitator for collaboration of professionals from various backgrounds and organizations (see Section 4).

Box 14. Multi-professional teams in palliative care in Germany

Since 2007, when Specialized Ambulatory Palliative Care (SAPV) was introduced as part of standard care, multi-professional teams have played a central role in palliative care in Germany. SAPV is a patient-centred model that involves different professionals including specialised nurses, physicians specialized in palliative care, and psychosocial professions. These multi-professional palliative care teams provide case management, coordination of care, and comprehensive pain and symptoms management, as well as psychosocial support. They closely collaborate with other health professionals, ambulatory hospice services and volunteer hospice aid. Services are provided at home, in long-term care facilities and hospices and are available 24/7 (Berger et al., 2022; Blümel et al., 2020).
3. What is the evidence on the impact of skill-mix innovations on health outcomes and resource use?

Skill-mix innovations can help facilitate the implementation of integrated care, but do they also improve care? In this section we present evidence on the impact of skill-mix innovations for patients with chronic conditions and multimorbidity on health outcomes, patient experiences and costs (see Box 2 for methods). Table 2 provides a summary of the collected evidence.

### Patient-related outcomes

**Advanced practice roles** in the care of chronically ill patients were shown to be mainly taken up by pharmacists and nurses. Pharmacists delivering care such as patient education and health screening for patients with chronic conditions has been shown to positively influence blood glucose levels and blood pressure control and had comparable results on health-related quality of life (Aguiar et al., 2016; Cheema, Sutcliffe & Singer, 2014; Colombo et al., 2017; Deters et al., 2018; Entezari-Maleki et al., 2016; Fazel et al., 2017; Greer et al., 2016; Morgado et al., 2011; Winkelmann et al., 2022).

### SKILL-MIX INTERVENTION

<table>
<thead>
<tr>
<th>SKILL-MIX INTERVENTION</th>
<th>PATIENT-RELATED OUTCOMES</th>
<th>HEALTH SYSTEM-RELATED OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advanced practice roles of pharmacists</strong></td>
<td>• Significant improvement of health outcomes (BCL, BP control, MA)</td>
<td>• Limited evidence on cost reduction and health services use (reduced emergency visits, hospitalization rates, reduced costs, improved drug management)</td>
</tr>
<tr>
<td></td>
<td>• Equivalent health outcomes for CKD, COPD, depression</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No improvement of depression symptoms</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced practice roles of nurses</strong></td>
<td>• Improved health outcomes (HbA1c levels, blood pressure and MA and depression severity)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Equivalent outcomes on exacerbation frequency and renal outcome</td>
<td>• Improved transition from inpatient to outpatient settings and reduced hospital readmissions</td>
</tr>
<tr>
<td></td>
<td>• Inconclusive evidence on impact on mortality</td>
<td></td>
</tr>
<tr>
<td><strong>Nurse-led clinics</strong></td>
<td>• Improved MA for cardiac clinics and reduced nocturnal awakenings</td>
<td>• Mixed evidence on resource use</td>
</tr>
<tr>
<td></td>
<td>• No long-term impact on blood pressure, quality of life and self-perceived health</td>
<td>• Limited evidence on cost reduction</td>
</tr>
<tr>
<td></td>
<td>• Mixed results on risk of myocardial infarction</td>
<td></td>
</tr>
<tr>
<td><strong>Peer educators and community health workers</strong></td>
<td>• Improved health outcomes (HbA1c levels, blood pressure, BMI, self-efficacy, physical activity levels)</td>
<td>• Increased use of primary care</td>
</tr>
<tr>
<td></td>
<td>• Mixed evidence for patients with mental illness</td>
<td>• Mixed evidence on hospital admission</td>
</tr>
<tr>
<td></td>
<td>• Improved patient engagement in treatment and social relationships</td>
<td></td>
</tr>
<tr>
<td><strong>Patient navigators</strong></td>
<td>• Improved adherence to screening and diagnostic follow-up</td>
<td>• Lower waiting times and hospitalization rates</td>
</tr>
<tr>
<td>(see complementary Policy Brief by Budde et al., 2022)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Care coordinating roles</strong></td>
<td>• Significant improvement of self-reported health and patient satisfaction</td>
<td>• Mixed evidence, some positive impact on resource use</td>
</tr>
<tr>
<td></td>
<td>• Improved HbA1c levels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No impact on mortality</td>
<td></td>
</tr>
<tr>
<td><strong>Team-based care</strong></td>
<td>• Modest reduction of HbA1c levels, blood pressure and medication adherence</td>
<td>• Limited evidence on cost reduction</td>
</tr>
<tr>
<td></td>
<td>• Significant impact of collaborative care on patients with mental health issues or multimorbidity</td>
<td>• Mixed evidence on resource use</td>
</tr>
<tr>
<td></td>
<td>• No significant impact on physical and mental health and quality of life for cancer care coordination</td>
<td></td>
</tr>
</tbody>
</table>

Source: Winkelmann et al., 2022

Notes: BCL – blood cholesterol level; BMI – body mass index; BP – blood pressure; CKD – chronic kidney disease; COPD – chronic obstructive pulmonary disease; HbA1c - glycated haemoglobin; MA – medication adherence.
ween primary care physicians and physician specialists were shown to have a moderate impact on physical health (HbA1c levels, blood pressure, progression of chronic kidney disease, physical functioning) and medication adherence (Foy et al., 2010; Mitchell et al., 2015). Multi-professional collaborative care models involving primary care providers and mental health specialists were shown to improve depression outcomes and improve quality-adjusted life-years and also to lead to higher rates of adherence to antidepressant medication (Archer et al., 2012; Coventry et al., 2014; Foy et al., 2010; Sighinolfi et al., 2014; Smith et al., 2017; Thota et al., 2012). There was mixed evidence on multi-professional care coordination, for example in cancer care, which did not consistently improve physical and mental health or continuity of care but improved patient satisfaction and appropriate use of health care (Aubin et al., 2012; Gorin et al., 2017).

Health system-related outcomes

Overall, the evidence on cost savings and other health system-related outcomes is limited and mixed. There is some evidence that advanced practice roles of pharmacists may lead to cost savings (Entezari-Maleki et al., 2016; Wång, Yeo & Ko, 2016; Zhong et al., 2014) and reduced emergency department visits and hospitalizations (Entezari-Maleki et al., 2016; Manzoor et al., 2017). However, other reviews also found similar rates of resource use (Greer et al., 2016; Zhong et al., 2014) or higher rates of asthma patients seeking hospital care (Blalock et al., 2013). Evidence on nurses with advanced roles show that nurse-led collaborative care can reduce hospitalizations (Health Quality Ontario, 2013). Fergenbaum et al. (2015) showed that nurse- or pharmacist-delivered care in the home resulted in cost savings and reduced hospitalizations. But evidence on resource use is mixed, with reviews showing no difference in emergency department attendance and hospital admissions (Baishnab & Karner, 2012; Kuethe et al., 2013; Schadewaldt & Schultz, 2010). For care coordination roles there was limited evidence on case managers showing no difference on costs and service use (Stokes et al., 2015). However, community health workers providing chronic care management showed significant decrease of medication use, emergency rooms visits and hospitalizations, as well as annual costs (Jack et al., 2016). Moreover, nurses providing transitional care from inpatient to outpatient settings were associated with reduced readmission rates among adults with mental illness (Vigod et al., 2013). For nurse-led clinics no significant difference was reported in terms of accident and emergency department attendance and hospital admissions (Baishnab & Karner, 2012; Kuethe et al., 2013; Schadewaldt & Schultz, 2010). The community health worker model produced higher rates of successful transfer and attendance in adult clinics compared with usual care (Chu et al., 2015) and a decrease of medication use and patient costs (Jack et al., 2016). In mental health peer educators improved patient engagement in treatment and social relationships (Wright-Berryman, McGuire & Salyers, 2011). Welsh, Hasan & Li (2011) found mixed evidence of self-management education provided to patients by various
health professionals on hospital admissions and no effect on emergency department visits. **Patient navigators** for breast cancer patients were shown to reduce waiting times (Robinson-While et al., 2010). In diabetes care patient navigators had a positive impact on hospitalization rates and emergency department visits (Budde et al., 2021).

Evidence on cost reduction for **collaborative care and teamwork** is limited. In regard to use of health resources evidence is mixed, with some reviews indicating reduced emergency department and hospital visits (Archer et al., 2012; Carter et al., 2016; Gandhi et al., 2017) while others find no difference on health care utilization (Gillies et al., 2015; Mitchell et al., 2015; Nicoll et al., 2018).

Overall, evaluations of skill-mix innovations have shown positive effects on some health outcomes and coordination of care (i.e. reduced hospitalizations and emergency department visits, improved appropriate use of health care); however, results are mixed and evaluations of health system-related outcomes remain limited (for more details see Winkelmann et al., 2022).
4. What are the levers and barriers for implementing skill-mix innovations within integrated care?

Implementation of new professional roles, tasks and multi-professional collaboration (across organizations) is most effective when it is part of concerted efforts to support integration at the system (macro), organizational (meso), and professional and patient (micro) levels. This section outlines six main governance instruments that affect successful implementation of skill-mix change within the context of integrated care (Figure 1). These emerged from an overview of reviews and a broader literature search that reflect barriers and facilitators for developing skill-mix innovations for integrated care (Maier, Scarpetti et al., 2022) (see also Box 2).

At the health system (macro) level workforce developments and regulatory contexts are fundamental for creating favourable conditions for skill-mix innovation and integration of care. This includes policy, laws and professional regulation as well as financing. At the organizational (meso) level organizational settings, leadership and support determine whether new roles and skill-mix innovations are fostered. At the micro level communication and working relationships are the key factors that affect successful implementation of skill-mix changes.3

Within these six governance instruments, there are various factors that can constitute barriers and facilitators for the implementation of skill-mix change. The identification of these factors can help inform policy and practice on how to improve implementation of integrated care programmes. Table 3 provides an overview of these contextual factors and related facilitators and barriers divided into three levels of integration (macro, meso, micro) that influence skill-mix implementation within the context of integrated care.

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**Figure 1. Main governance instruments that support the implementation of skill-mix innovations to foster integrated care**

Source: Authors, based on Bourgeault et al. (2008); Maier, Kroezen et al. (2022); Scarpetti et al. (2022).

3For an example of how these themes apply to the implementation of the role of patient navigators, please refer to the Policy Brief ‘What are patient navigators and how can they improve integration of care?’ (Budde et al., 2021).
Table 3. Facilitators and barriers of skill-mix change within integrated care interventions

<table>
<thead>
<tr>
<th>GOVERNANCE INSTRUMENTS</th>
<th>FACTORS</th>
<th>EXAMPLES OF FACILITATORS</th>
<th>EXAMPLES OF BARRIERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MACRO: SYSTEM INTEGRATION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy, laws and professional regulation</td>
<td>Professional roles and scopes of practice, title regulation; legislation around liability issues; broader political context</td>
<td>Frameworks in place to ensure clearly defined scope of practice and professional boundaries</td>
<td>Lack of clear frameworks; uncertainty about liability and responsibilities</td>
</tr>
<tr>
<td></td>
<td>Joint workforce planning</td>
<td>Information on supply and skills of staff</td>
<td>Missing information on supply and skills of staff; lack of joint workforce planning</td>
</tr>
<tr>
<td>Education and training</td>
<td>Educational and training standards</td>
<td>Minimum educational standards, training and CPD; framework curricula</td>
<td>Lack of or limited training/education</td>
</tr>
<tr>
<td>Financing</td>
<td>Various payment and financing models for skill-mix</td>
<td>Sufficient and multiannual funding; financial incentives for providers; transformation funding</td>
<td>Lack of funding; lack of financial evaluations on cost impact of new roles; fragmented funding</td>
</tr>
<tr>
<td><strong>MESO: ORGANIZATIONAL AND PROFESSIONAL INTEGRATION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational frameworks</td>
<td>Existing service delivery and infrastructure</td>
<td>Institutional arrangements that favour multi-professional care; IT infrastructure to support multi-professional teams; physical proximity of providers; digital solutions (patient records)</td>
<td>Uncoordinated delivery structures; lack of infrastructure to support multi-professional care</td>
</tr>
<tr>
<td></td>
<td>Assessment of population health needs</td>
<td>Information on complex care needs; continuous quality improvement</td>
<td>Missing information on health needs at local level</td>
</tr>
<tr>
<td></td>
<td>Institutional governance and arrangements</td>
<td>Organizational culture that supports innovation and collaboration; existence of shared values and common vision; common language</td>
<td>Lack of shared vision and values; lack of accountability structures and mechanisms</td>
</tr>
<tr>
<td>Support and leadership</td>
<td>Leadership and role of stakeholders</td>
<td>Support from leadership and management for skill-mix change, training and CPD; support from professional associations</td>
<td>Lobbying from professional organizations against change</td>
</tr>
<tr>
<td><strong>MICRO: INTEGRATION AT THE PATIENT AND TEAM LEVEL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication and working relationships</td>
<td>Communication, team dynamics, professional identity, normative perception of care; conception of ways of working</td>
<td>Clear and effective communication within the team and with the patient; pre-existing working relationships; understanding/respect of roles, responsibilities and professional boundaries; appropriate supervisory structure, mutual trust, team culture, ‘local champions’</td>
<td>Lack of communication and problematic multi-professional team dynamics; reluctance to change among health professionals; unequal power relationships</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation based on Looman et al., 2021; Gilburt, 2016; Rijken et al., 2017; Bourgeault et al., 2008

Notes: CPD – continuous professional development.
Macro-level factors

Policy, laws, professional regulation

Policy and legal frameworks concerning new and expanded roles can act as facilitators to successful skill-mix implementation, or as barriers if not, or insufficiently, in place. For example, existence of scope-of-practice laws, clear accountability and liability frameworks were identified in the literature as particularly important for implementing interorganizational collaboration (Scarpetti et al., 2022). The broader political context in which skill-mix changes take place can also add challenges. For example, sudden changes in the political environment can negatively affect the feasibility and sustainability of a new skill-mix implementation (Mapp, Hutchinson & Estcourt, 2015).

To successfully implement skill-mix innovations which support integrated care, they need to be part of a system-wide process of integration that creates regulatory frameworks for new ways of collaborations and professional roles (Gilburt, 2016). Professional regulation is a key aspect in this regard. It defines tasks, roles and/or responsibilities, and as such can simultaneously act as a facilitator as well as a barrier. Professional regulation can foster skill-mix changes by clearly defining new professional roles and establishing descriptions of tasks or scopes of practice (Imison et al., 2016; Scarpetti et al., 2022). As such it creates clarity and can help inform staff and patients about the new roles. Legislation can be a barrier if overly restrictive. In countries with highly and restrictively regulated scopes of practice, changes to scopes of practice are a prerequisite for health professionals to work with the skills acquired by training and to take full responsibilities for their duties (also vis a vis other professional groups).

For effective implementation of integrated care, joint workforce planning will need to consider multi-professional collaboration. A crucial step in planning is understanding what is needed from the new workforce to meet current and future patient needs (Imison et al., 2016). As such, a sufficient number and skill-mix of health professionals is paramount for the successful implementation of integrated care models. For example, in the case of the so-called new district nurses in the Netherlands, whose role is broader than the traditional role and is aimed at the integration of health care, housing, employment and integration (Grijpstra et al., 2013), the biggest barrier to change and uptake in practice has been the shortage of specialized nurses who could work as district nurses.4

Education and training

Lack of education, training and continuous professional development (CPD) is a consistent barrier found in studies of skill-mix changes to support integrated care (Gilburt, 2016). With rising numbers of patients with complex needs, it is necessary to shape training to address changes in patient needs as well as any gaps created by workforce shortages (Imison et al., 2016) and to update core training and education principles to meet the requirements of the new and expanded roles. To ensure that skill-mix innovations can develop full potential to foster integrated care, a set of new skills and competencies must be part of education and training programmes. Adapting the health workforce to address population needs in the future requires thoughtful planning that spans multi-professional education and clinical placements. As such, it requires cross-sectoral collaboration between regulators from the educational and the health sectors.

In Europe three novel elements in professional education aim to address the growing demand for health competencies to support multi-professional care, namely interprofessional education (IPE), competency-based education and the academization of health professionals that aims to move the training of some health professionals from a vocational to an academic level (Maier, Scarpetti et al., 2022). IPE includes elements of interactive and in-place-based training among different professionals to help foster collaboration as it trains professionals to develop mutual understanding and the ability to co-create integrated care and to collaborate with other professionals. Competency-based education entails adapting curricula to skills and competencies needed in new roles. Box 15 presents some key competencies that support successful skill-mix changes for integrated care.

Box 15. Key competencies for effective skill-mix changes to foster integrated care

To take up and successfully fulfil new roles of liaison and coordination in integrated care, health professionals need a variety of skills, including in shared decision-making (with patients and in cooperation with other providers), in planning, setting up, rolling out and evaluating shared patient care plans, in support of self-management, in teamwork (communication and negotiation) as well as digital skills to use new technologies (shared electronic health and social care records) that enhance coordinated and individualized integrated care.

The OECD has proposed a competency framework which defines key skills and competencies for health professionals that will allow more effective patient-centred care (Maeda & Socha-Dietrich, 2021; OECD Health Division team, 2018). These skills become increasingly important in the light of more complex care environments, technological change, organizational restructuring, multi-professional teamwork and the dual challenges of technically and emotionally complex healthcare workplaces. Two types of skill set have been distinguished:

- Transversal skills including interpersonal skills (person-centred communication), shared decision-making, interprofessional teamwork, self-awareness and sociocultural sensitivity
- Analytical skills including adaptive problem-solving to devise solutions for patient-centred care, health system awareness and system thinking, ehealth skills, openness to continuous learning and skills for supporting a positive work culture (stress and fatigue management, mentoring).

4 District nurses assess the needs of their clients and coordinate their care between clients, informal carers, GPs, other healthcare professionals and social care professionals (Kroneman et al., 2016).
More research is needed to evaluate the impacts of these three developments in professional education and how they can contribute to skill-mix implementation (Maier, Scarpetti et al., 2022). Further, quality data are needed to model supply, demand and needs, and to improve future workforce planning (Balasubramanian & Short, 2021).

Overall, the education of health professionals who take up new and extended roles must allow for high quality and flexible study programmes and pathways. Regulation of education can also facilitate uptake of a new role or task. In Finland nurses who complete a specific postgraduate education as nurse prescribers are authorized to issue prescriptions for common minor illnesses and prescribe for hypertension, diabetes and asthma (Maier, Aiken & Busse, 2017). In other countries prescribing skills are integrated within the curricula of Bachelor or Master-level nursing programmes (e.g. Cyprus, Estonia, Spain) (Maier, 2019). However, strict education credentialling may also become a barrier for a certain cadre of staff if overly high requirements are in place for certain roles and tasks. Similarly, identifying adequate lengths and contents of training for lay workers, informal caregivers or peers is an important policy question to be addressed. For example, otherwise qualified lay persons who act as patient navigators for their community should receive some training, but educational requirements should not be too high, since this may pose an obstacle for some who would be very well equipped to reach the underserved or peer communities (Oundina, Garfield & Downer, 2019).

**Financing**

Financing is a critical policy lever that can incentivize or disincentivize the implementation of skill-mix innovations. The availability of stable and sufficient levels of funding is necessary to pay providers for carrying out the new roles or to fund entirely new professions, to enable health professionals to undertake training and continuous professional development (CPD) to obtain new skills, competencies and qualifications, and to educate and train new health professionals. For example, in Finland financial incentives for nurse prescribers were not sufficient to compensate for the demanding training required for the prescription right, which slowed down the implementation process of nurse prescribers.

Lack of payment and recognition by payers meanwhile has been shown to be an important impediment to skill-mix reforms. For example, Kroezen et al. (2011) found that some US providers had not taken up the use of nurse prescribers because nurse prescriptions in some states were not covered by payers. Cashin (2014) meanwhile noted that in Australia the lack of recognition of physician assistants by the Medical Benefits Scheme and Pharmaceutical Benefits Scheme meant that patients would pay more for prescribed medicines, undermining implementation. Regulatory, policy and contractual changes may therefore be required to set or change reimbursement rates for new roles or professions. Reimbursement levels should consider professionals’ costs and time, as well as liability issues (Farris et al., 2010), and will often need to be negotiated with different professional groups. As noted by Bourgeault et al. (2008), this may undermine the cost-effectiveness of skill-mix innovations if new or substitute professionals demand similar reimbursement rates to those of the existing profession. However, if reimbursement rates are too low, it may decrease uptake of new roles and tasks.

The use of different types of payment mechanism may also help to (dis)incentivize providers to hire specific staff and integrate them into routine health service delivery. Fee-for-service, for instance, which pays providers a set fee for performing a task, has been shown to undermine collaborative care and task shifting (Karam et al., 2018). While capitation fees and pay for performance may be more likely to incentivize uptake of skill-mix initiatives than fee-for-service, the evidence overall is mixed and limited (Carter et al., 2016). In contrast, payments focused on teams (e.g. using pay-for-co-ordination schemes to pay for group practice) rather than individuals are more likely to incentivize uptake of new roles and professions and to encourage greater integration of care. Overall, a blend of payment mechanisms may be needed to facilitate implementation of skill-mix reforms for integrated care, the adoption of which will likely be informed by existing payment systems and other contextual factors.

**Meso-level factors**

**Organizational frameworks**

Organizations can help to facilitate the implementation of skill-mix interventions by addressing practical implementation issues, including general infrastructure, such as physical proximity of the services provided, as well as IT infrastructure (Kroezen et al., 2022). Ensuring compatibility of IT tools, for example, can help address some of the organizational issues faced by providers. In particular, the use of electronic health records can facilitate communication between providers (De Maeseneer et al., 2022).

Coordinated governance structures across organizations are also key to effective integration. For example, in the UK the NHS introduced an innovative skill-mix element known as social prescribing, or community referral. In this case the lack of a joint service level agreement, including the data requirements and details of governance structure, acted as a barrier to implementation (Pescheny, Pappas & Randhawa, 2018).

**Support and leadership**

Institutional governance plays an important role in driving integrated care. Not only shared values and common vision but also common language used by professionals who are part of innovative approaches such as multi-professional teams can lever the transformation of care provision (Barry et al., 2021). Leadership and stakeholder involvement play a major role as local champions in facilitating or hindering skill-mix change, in particular for taking forward new ways of professional working and the uptake and integration of new roles. Effective leadership entails setting priorities and
directing multiple stakeholders towards those priorities for more efficient, accessible and equitable care (Figueroa et al., 2019). When introducing new roles that span organizational boundaries, a supportive leadership can ensure that they are aligned with the system-wide integration efforts (Gilburt, 2016). Hence, support from the wider health and social care leadership and management for skill-mix change, training and CPD, as well as involving professional associations and other stakeholders, can be controversial in the beginning but, once a consensus is found, can accelerate and facilitate the change process. For example, in the UK the support of the British Medical Association has been a facilitator in the policy process and implementation of nurse prescribing (Kroezen et al., 2011). In Ireland strong support from the professional nursing association and the central government were critical in the initial stage of the implementation of a regulatory framework for nurse/midwife prescribing (Maier, 2019; Wilson et al., 2018). On the other hand, strong opposition from professional associations wanting to maintain the status quo can also hinder progress. One review on nurse prescribing (Kroezen et al., 2011) indicated that medical associations played a major role in opposing laws on nurse prescribing in countries like Australia and Spain, and some states in the USA, which led to limited prescribing rights for nurses. Several reasons may lie behind this opposition, such as issues with established interprofessional hierarchy and power relations (Scarpetti et al., 2022). On the other hand, experiences collected within the SELFIE project have shown that the argument of reduced workload as a result of task-shifting convinced certain groups of professionals who were originally reluctant to engage in teamwork (Looman et al., 2021).

**Micro-level factors**

**Communication and working relationships**

At the micro level team dynamics and communication are pivotal for the successful integration of skill-mix changes within integrated care. For example, a rigid hierarchy and lack of communication creates bottlenecks for introducing new tasks and roles. Conversely, clear and effective communication, a shared understanding of professional boundaries, as well as appropriate supervisory structure, can help integrate new roles into existing team dynamics (Gilburt, 2016). In particular, joint understanding and agreement of new roles is a prerequisite for skill-mix innovations to be accepted and sustained among professionals as well as among patients. A clear definition of who is responsible for what coordination element plays out in daily practice and ultimately defines whether new roles are accepted. Moreover, pre-existing working relationships between providers have been shown to be important for successful implementation (Reed et al., 2021). To ensure effective teamwork, time needs to be allocated to allow for team activities such as regular team meetings. The latter are central for coordinating and aligning care activities, as identified by Looman et al. (2021) and Murtagh et al. (2021). They largely contribute to mutual trust, facilitate (informal) communication between professionals, and create and reinforce relationships which are central elements for integrated care. In this respect, the engagement between professionals right from the outset and the communication of the benefit for all stakeholders involved (e.g. more time for patient consultation, reduced workload, more teamwork and exchange between the providers and higher patient and professional satisfaction) helps to foster sustained acceptance and support among professionals (Akehurst et al., 2021). Important for the development of multi-professional teamwork are coordination structures such as incentives for joint goals and shared care plans, as well as structured referrals facilitated through digital health solutions. Consistent working practices, protocols and good access to shared resources also help achieve care coordination, which is one of the main challenges for multi-professional teamwork. In Finland the introduction of nurse prescribers showed that successful implementation of a fundamental change in the division of work between nurses and physicians required thorough care plans and guidelines to be in place, as well as clear task allocation and mutual trust between nurse prescribers and GPs (Hopia, Karhunen & Heikkilä, 2017; Savolahti, 2016; Sulkkakoski, 2016).

An evaluation of a new nursing role in integrated case management of patients with complex needs in Valencia, Spain, reported that health professionals increasingly valued enhanced cooperation, though some reluctance remains, especially among hospital doctors (Barbabella et al., 2015; Gallud, Soler & Cuevas, 2012). One challenge was staff reluctance to accept the addition of new roles that may change or replace existing roles (Gilburt, 2016), as well as instances of ‘professional protectionism’ (Christmas & Millward, 2011; Gainsburry, 2009). In the case of social prescribing in the UK, structured contact, regular feedback and communication between navigators and practice staff allowed for smooth implementation and delivery of social prescribing services (Pescheny, Pappas & Randhawa, 2018). Other issues to consider around the implementation of skill-mix interventions are how to create a sense of belonging for staff not located in the same place (Imison et al., 2016), addressing the established interprofessional hierarchy and power relations, and exposing differing views on patient care (Karam et al., 2018), as well as addressing resistance from patients, who may not fully understand the new roles.

**How can policy-makers design and implement skill-mix innovation to drive integrated care?**

Many skill-mix innovations face challenges to scale-up and sustain the changes they have created, which hampers integrated care. Drawing on the macro-, meso- and micro-level facilitators and barriers discussed in this section, the remainder of this section seeks to provide guidance for policy-makers on what needs to be considered when designing and implementing skill-mix innovations to foster sustained change for more integrated care (Figure 2) (see also Policy Brief by Nolte (2018)).
How can skill-mix innovations support the implementation of integrated care for people with chronic conditions and multimorbidity?

Step 1. Identify population health and workforce needs
First, the changing health needs of the local population and the disruption of care provision need to be identified to assess other potential solutions. An assessment of the skill mix of the health and social care professionals as well as existing provider structures should be conducted to identify whether shortages of specific health professionals and types of provider exist or are expected. With the ageing workforce, there is also a need for workforce-demand planning, supporting sustainable employment of health providers as well as informal caregivers.

Step 2. Identify sustainable solutions and develop a joint vision
If skill-mix changes are assessed to be a realistic option to address the problem, a consultative process involving all relevant stakeholders should be started to create a joint vision and shared goals, to reinforce relationships and mutual trust between providers and to identify existing professional boundaries. To counter opposition from stakeholders and to facilitate this process, external moderators and different techniques of involvement and consensus-seeking might be employed to create an evidence-based discussion.

The choice and design of skill-mix innovations should be informed by experiences and evaluations from existing local initiatives and care models, and should consider local contexts and circumstances such as care pathways, care provider structures and long-established relationships.

Step 3. Identify required skills and training
Once a potential solution is identified, necessary changes regarding training and skills must be established. Questions on the availability of health professionals with specific skills and the identification of adequate training programmes are central. Postgraduate training programmes and continued medical education may already exist and should be made accessible for health professionals, both in terms of funding and time. Moreover, entry requirements to qualify for new or expanded roles need to be defined.
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Step 4. Identify other system-level barriers to scale-up

If the skill-mix innovation is to be scaled up, various challenges at system level will need to be addressed, such as the definition and regulation of roles and scope of practice. Responsibilities and tasks must be clearly defined, ideally in a co-design process with professionals and providers, to create shared expectations around the new work practices and to avoid duplication of work. Challenges regarding interoperability of health data systems (electronic health record), IT infrastructure and data sharing must be identified and formulated, if possible, in a broad consultative process. For example, access to and skills to use necessary digital repositories must be provided. Another important lever is the involvement of all relevant stakeholders, such as providers, professional bodies and organizations and policy-makers, to create a supportive environment and identification with the integrated care model. At the same time it reduces competition, which is important for scale-up and sustained changes to new work practices.

Step 5. Financing mechanisms and supportive policy are important drivers

Financing is central not only for funding of training programmes but also to create incentives for collaborations across professions and organizations. Innovative payment methods for skill-mix innovations, teamwork and integrated care are bundled payments, shared-saving models/joint budgets, or various combinations of these with traditional payment methods (salaries, budgets, capitations, FFS). As innovations in service delivery need time to develop, adapt and foster, there needs to be a commitment to multiannual/consistent funding and a supportive policy environment. A clear policy that sets the agenda for new models of care, including skill mix that allows local contexts to be taken into account, is another important lever for skill mix within integrated care.

Step 6. Monitoring and evaluation of the implementation process and outcomes to adapt the solution

Formal evaluations of skill-mix changes within integrated care that assess patient and system outcomes, successes and barriers contribute to learning from previous experiences and for the design of new solutions. Several tools are available to measure process and outcomes, but few are specifically intended for interventions to support integrated care. Monitoring and evaluation should cover the views of patients/carers, professionals and system/governance. Questions that need to be addressed in evaluations must include, among others: Is there a long-term view for planning?; Are patients, staff and professional organizations involved throughout the process?; Are new roles and tasks clear to all health professionals involved and are they accepted by providers and patients? Most importantly, evaluations need to assess whether skill-mix changes improve health outcomes and health system performance in terms of quality, access and efficiency.
5. Conclusions

Many countries in Europe are reorganizing the delivery of health and social care services in response to the increasing burden of chronic conditions and multimorbidity, recognizing the need to improve integration of care. This Policy Brief has shown that skill-mix innovations can play a key role in integrated care, with six types of skill-mix innovation appearing to be particularly promising: (1) Shifting tasks and roles, (2) Relocation of care to other settings, e.g. to nurse-led clinics, (3) Introduction of care coordination roles, (4) Empowering patients and caregivers through new roles, (5) Introduction of dedicated prevention roles in primary care, and (6) Establishment of teamwork and collaboration in multi-professional teams. These skill-mix changes are a response to the demonstrated local need for new roles and identified gaps in capabilities and capacity.

Skill-mix initiatives often remain fragmented because (national or subnational) policies to implement skill mix for better integrated care are lacking. To ensure sustainable and comprehensive implementation of skill-mix innovations, simultaneous actions at various levels are required to successfully scale-up and embed changes into integrated care programmes and healthcare systems more widely. The interplay of different factors at the various levels determines whether implementation will be successful. The regulation of roles, professions, responsibilities and authorities is a fundamentally important aspect both to clarify new roles and enhance scope of practice. Other factors, such as education and training and financing, as well as meso- and micro-level factors such as organizational frameworks, support and leadership and communication and working relationships define whether skill-mix initiatives can be sustained beyond the pilot phase.

Evaluation of skill-mix innovations to generate evidence on what works and what does not is central for the upscaling of innovative skill-mix solutions and for generating evidence and lessons that feed back to implementation. However, there is still limited research on the implementation side of skill mix, and high-quality studies and reviews to analyse implementation are particularly scarce. More implementation research is therefore required, using a systematic, cross-country comparative approach, but at the same time taking into account contextual differences. Finally, few countries formally evaluate the implementation of reforms on skill-mix innovations, which is critical to understanding why some reforms have been effectively implemented and others have been delayed or not successful.
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How can skill-mix innovations support the implementation of integrated care for people with chronic conditions and multimorbidity?


De Maeseneer J, Scarpetti G, Budde H, Maier CB (2022). How can skill-mix innovations support the implementation of integrated care for people with chronic conditions and multimorbidity?


IRDES (2018). Action de santé libérale en équipe (Asalee): un espace de transformation des pratiques en soins primaires [Action of self-employed health providers working in...


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Keywords:
Skill mix, integrated care, re-allocation of care, chronic conditions, multimorbidity

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