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Nurses in advanced roles in primary care: Policy levers for implementation

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NURSES IN ADVANCED ROLES IN PRIMARY CARE: POLICY LEVERS FOR IMPLEMENTATION

Claudia B. Maier*, Linda H. Aiken and Reinhard Busse***

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ABSTRACT

Many OECD countries have undergone reforms over the past decade to introduce advanced roles for nurses in primary care to improve access to care, quality of care and/or to reduce costs. This working paper provides an analysis of these nurse role developments and reforms in 37 OECD and EU countries. Four main trends emerge: 1) the development in several countries of specific advanced practice nursing roles at the interface between the traditional nursing and medical professions; 2) the introduction of various new, supplementary nursing roles, often focused on the management of chronic conditions; 3) the rise in educational programmes to train nurses to the required skills and competencies; and 4) the adoption of new laws and regulations in a number of countries since 2010 to allow certain categories of nurses to prescribe pharmaceuticals (including in Estonia, Finland, France, Netherlands, Poland and Spain).

The availability of data to routinely monitor the deployment of Advanced Practice Nurses such as Nurse Practitioners (NPs) is currently limited to a small number of countries (Australia, Canada, Ireland, Netherlands, New Zealand and United States). The data available in these countries show large variations in the size and work settings of NPs. The United States is leading by far in both the number and share of all nurses who are NPs, although the number of NPs has generally increased in all six countries. In other countries, data availability is limited, hampering a routine monitoring of this growing workforce and more integrated health workforce planning.

A synthesis of the large number of systematic reviews and evaluations shows that nurses working in advanced roles provide at least equivalent quality of care compared with General Practitioners (GPs)/physicians when they are adequately trained. Moreover, the evidence also suggests reduced hospital (re-) admissions and higher patient satisfaction. Results on costs are mixed and depend on factors such as the productivity and remuneration differentials between nurses in advanced roles and physicians.

Barriers to implementation of advanced practice nursing are fairly similar across countries. These include the opposition from certain stakeholders (notably the medical workforce), regulatory barriers (including outdated and overly restrictive scope-of-practice laws), financing and reimbursement schemes (if not appropriately recognising these new roles), or slow uptake at the organisational level (due to the absence of strong leadership and poor change management strategies).

Policy instruments to promote the integration of new, advanced nursing roles into routine care include regular reviews of scope-of-practice laws and/or regulations by independent experts, along with their harmonisation in decentralised country contexts. Regarding financing and reimbursement schemes, two elements are particularly relevant: the recognition of new roles by payers and the level of reimbursement of these services. Financial incentives and disincentives can be used to “kick start” the implementation of new roles for nurses in primary care practices, as demonstrated in Estonia and Lithuania. In addition to these policy levers, organisational-level factors can also greatly influence the uptake of new nursing roles in different settings: ongoing support and commitment by management is a critical success factor. Hence, both policy and organisational interventions are critical to implement skill-mix changes, remove barriers to practice and meet local needs.

RÉSUMÉ

De nombreux pays de l'OCDE ont entrepris des réformes au cours de la dernière décennie pour favoriser le développement de nouveaux rôles plus avancés pour le personnel infirmier dans le domaine des soins primaires, afin d'accroître l'accès, la qualité des soins et/ou réduire les coûts. Ce document de travail analyse le développement de ces nouveaux rôles dans 37 pays de l'OCDE et de l'Union européenne. Quatre grandes tendances se dégagent : 1) le développement de rôles spécifiques plus poussés pour les infirmiers à l'interface entre leurs rôles traditionnels et ceux des médecins ; 2) l'introduction de nouveaux rôles et tâches supplémentaires pour les infirmiers, souvent dans le domaine de la gestion des maladies chroniques ; 3) le développement de programmes d'éducation plus avancés pour fournir aux infirmiers les compétences requises ; et 4) l'adoption de nouvelles lois et réglementations depuis 2010 permettant à certaines catégories d'infirmiers de prescrire des médicaments (par exemple, en Espagne, Estonie, Finlande, France, Pays-Bas et Pologne).

Les chiffres disponibles pour évaluer le nombre d'infirmiers en pratique avancé comme les « infirmiers praticiens » restent limités à un nombre restreint de pays (Australie, Canada, États-Unis, Irlande, Nouvelle-Zélande et Pays-Bas). Les données disponibles dans ces pays montrent de fortes variations au niveau du nombre et des lieux de pratique des infirmiers praticiens. Les États-Unis sont de loin le pays ayant le plus grand nombre et la plus forte proportion d'infirmiers qui sont des infirmiers praticiens, bien que le nombre d'infirmiers praticiens a généralement augmenté dans ces six pays. Dans les autre pays, les données disponibles sont limitées, ce qui empêche un suivi régulier de cette main-d'œuvre croissante et une planification de la main-d'œuvre en santé plus intégrée.

Une synthèse du grand nombre de revues systématiques et des évaluations montre que les infirmiers qui travaillent dans des rôles avancés fournissent une qualité de soins équivalente à celle des médecins généralistes quand ils sont adéquatement formés, contribuent à réduire le nombre de (ré) admissions à l'hôpital, et augmentent le niveau de satisfaction des patients. L'impact sur les coûts est plus contrasté et dépend de facteurs comme les différences de productivité et de rémunération entre les infirmiers en pratique avancée et les médecins.

Les obstacles au développement de rôles avancés pour les infirmiers sont assez similaires dans les différents pays. Il y a notamment l'opposition de certains acteurs dans les systèmes de santé (notamment les médecins), des lois et réglementations désuètes et trop restrictives en ce qui concerne les champs de pratique, les systèmes de financement et de remboursement qui ne reconnaissent pas suffisamment ces nouveaux rôles, et l'inertie face au changement au niveau organisationnel (souvent liée à l'absence d'un leadership fort et de stratégies de gestion du changement).

Les leviers politiques pour promouvoir le développement des pratiques infirmières avancées incluent des révisions régulières des lois et réglementations relatives aux champs de pratique par des experts indépendants, combinées à l'harmonisation de ces champs de pratique dans les pays où ces lois et réglementations sont décentralisées. Deux éléments concernant les systèmes de financement et de remboursement sont particulièrement importants : la reconnaissance des nouveaux rôles par les payeurs et le niveau de remboursement des services. Des éléments incitatifs (ou dissuasifs) de nature finanière peuvent être employés pour « briser la glace » et favoriser l'introduction de nouveaux rôles pour les infirmiers dans le domaine des soins primaires, comme le montre les expériences menées en Estonie et en Lithuanie. Outre ces leviers politiques, des facteurs organisationnels peuvent aussi fortement influencer l'adoption de nouveaux rôles pour les infirmiers : le soutien et l'engagement continus des gestionnaires est un facteur crucial de succès.

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EXECUTIVE SUMMARY

1. Skill-mix reforms are receiving widespread interest in health workforce policy to ease provider shortages, improve access to people-centered care, and reduce costs. Policy-makers are increasingly recognising the need to align the size, composition, competencies and performance of their health workforce with increasing and diversifying population needs, and against the backdrop of rapidly changing health systems. Primary care provider models in many OECD countries have been for decades acute care-focused and physician-centered in solo- or small group practices. Yet, the rise in chronic conditions has triggered changes to service delivery models. New and more time-consuming tasks and new skill-sets are required from teams. In many countries, changes to payment mechanisms are increasingly incentivising quality of care, including coordination of care and team work.

2. Several countries are facing workforce challenges, particularly in primary care. These can include existing or projected shortages of certain professions and specialisations, geographical maldistribution, different work-life priorities among the new generation of health professionals resulting in lower working hours, and workforce management and performance-related challenges.

3. As a consequence, countries are adapting the composition of their primary care workforce. One strategy is to advance the roles of nurses or other non-physician providers by expanding their skills and clinical activities in primary care. This report reviews recent developments with a focus on nurses in advanced roles in 37 OECD and EU countries. It suggests policy levers and other possible actions to support the implementation of new nursing roles in OECD countries.

OECD countries have used a mix of educational, regulatory and payment reforms to expand the roles of nurses in primary care

4. A large number of OECD countries are implementing educational, regulatory and/or payment-specific reforms to expand the practice profile of nurses. Nurse role advancement subsumes two concepts. First, task-shifting (a concept also referred to as ‘substitution’) whereby nurses - after additional training - take up activities formerly performed by physicians to alleviate shortages, reduce physician workloads and/or improve access. Second, nurses can also take on new complementary roles in clinical areas (often referred to as ‘supplementation’), such as case managers, liaison roles, eHealth monitoring and providing lifestyle advice. In practice, the boundaries between these two types of advanced roles are not always clear cut and they can overlap. However, one commonality is the advanced nursing education and their expanded practice profile, beyond the traditional scope-of-practice of registered nurses.

5. A 2015 survey showed that the majority of OECD and EU countries covered, had implemented and expanded the scope-of-practice of certain groups of nurses. Countries have embarked on educational reforms for nurses and moved the primary nursing education partly or fully to higher educational institutions, instigated in Europe by the Bologna process. Yet, many countries are at early stages of implementation. Moreover, roles vary considerably with variations in nurses’ roles, skills and responsibilities in primary care. These can be summarised into the following categories:

- advanced nursing roles working as ‘generalists’ to ease physician (e.g., GP) shortages, geographical imbalances and reduce physician workloads;

- advanced nursing roles focusing primarily on health promotion and prevention (e.g. screenings, immunisations) to scale up prevention activities; and

- advanced nursing roles working as single-disease 'specialists' to improve the management of chronic conditions (e.g. diabetes, breast cancer or coronary heart disease).

6. Four main trends have emerged. First, the development of Nurse Practitioners (NPs) or other Advanced Practice Nurses (APNs) working at the interface of the traditional nursing and medical professions. Second, many countries have established a variety of different, often supplementary clinical roles for nurses, such as chronic disease monitoring, eHealth support, liaison or case manager roles, that did not exist (or only in a very limited way) previously. Third, many countries have introduced NP/APN educational programmes to train nurses in these new roles. Finally, a total of fifteen countries have allowed certain categories of nurses to prescribe pharmaceuticals in a regulated environment. Between 2010 and 2016, Cyprus, Estonia, Finland, France, the Netherlands, Poland and Spain have adopted new laws to authorise nurse prescribing of pharmaceutical drugs. During the same period, Australia, Canada, the four parts of the United Kingdom (England, Northern Ireland, Wales, Scotland), Ireland, New Zealand, and the United States have expanded prescribing authority or removed barriers to nurse prescribing in practice. Denmark and Sweden have authorised limited nurse prescribing prior to 2010.

Quality is at least equivalent, and patient satisfaction improves when nurses play a greater role in care provision, yet evidence on costs remains inconclusive

7. The number of systematic reviews evaluating the clinical effectiveness and quality of care of nurses working in advanced roles compared to GPs/physicians has increased considerably over recent years. The evidence consistently shows that task-shifting results in equivalent or improved quality of care. These findings apply to nurses in various roles and to a range of acute and chronic conditions in various countries, including Australia, Canada, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States. Nurse-provided care - if adequately trained-, generally leads to higher patient satisfaction and lower hospital (re-) admission when compared to physician-provided care. Higher patient satisfaction seems to be related to the fact that nurses tend to provide more information and counselling to patients than physicians, take more time with the patients and provide more holistic care.

8. Evidence on the cost impacts and efficiency gains of nurses working in advanced roles compared to physicians remains inconclusive. While some studies suggest cost savings due to lower salaries or reimbursement levels for nurses (as shown in studies in the Netherlands and the United States), others find mixed results. Nurses tend to have longer consultations with patients and request more return visits, suggesting lower productivity than physicians. However, to the extent that this results in a better management of their conditions and contribute to lower hospital (re-)admission rates, this might lead to considerable cost savings. More and better-quality economic evaluations are required, particularly cost-effectiveness evaluations, to link costs with patient outcomes.

Improving data availability and quality on nurses working in advanced roles is critical to workforce monitoring

9. While an increasing number of countries are implementing reforms to expand the scope-of-practice of nurses, there is limited information internationally on the size of this workforce. The availability and quality of data varies considerably across OECD countries. In those countries where NPs or other nurses in advanced roles are regulated professions with mandatory registration or endorsement, data are usually available from authoritative sources, such as regulatory bodies. But in all other countries with no regulation and registration of specific (sub-) groups of advanced practice nurses (including the United Kingdom), data are often not routinely available.

10. Based on data on NPs routinely available in six countries (Australia, Canada, Ireland, Netherlands, New Zealand and United States), the size of the NP workforce varies considerably. The United States has by far the largest NP workforce in absolute and relative terms, reflecting – among other reasons – the fact that the United States was the first country to introduce the NP role in 1965 to fill gaps in primarily rural areas. The share of NPs working in *primary care* ranges from approximately 68% of all NPs in the United States to less than 10% with a relevant primary care specialisation in the Netherlands. One common feature is that the number of NPs has increased in recent years in all six countries. Hence, NPs may be able to fill future workforce gaps in primary care if the number of graduates continues to grow and the number of job openings increases. Improving the availability and quality of data would enable a better monitoring of the NPs workforce, as part of overall health workforce monitoring and planning.

Integrating advanced nursing roles in practice requires enabling governance, regulation and payment policies, combined with organisational level support

11. The implementation of advanced roles for nurses into routine care requires policy changes to the governance and regulation of professions, as well as changes to financing and payment systems. The uptake in practice also depends on supporting organisational level factors. Yet, policy reforms have often been lengthy and controversial, and frequently opposed by stakeholders such as medical associations.

12. Well-designed regulation of titles and scopes-of-practice via legislation or self-regulatory mechanisms is critical to support the uptake of advanced nursing roles. Existing regulations often limit the implementation of new roles when they are overly restrictive and require to be updated. In addition, in countries that have subnational regulatory mechanisms in place, there is a need to harmonise to the extent possible the regulations across jurisdictions to avoid having differences in the scopes-of-practice within countries. Some countries have decided not to regulate advanced practice via legislation, such as NPs in the United Kingdom, and have instead relied on employer protocols or collaborative arrangements at the level of individual health care settings. While this approach might offer greater flexibility, non-regulatory governance approaches can result in large variations across individual health care organisations in how official practice is defined, limit role clarity and data availability. Hence, up-to-date regulation (in line with nurses' advanced skills and competencies) brings benefits over non-regulatory governance mechanisms, through the protection of titles and scope-of-practice.

13. Financing mechanisms and reimbursement policies can also play a substantial role in the implementation of advanced nursing roles. Three policy lessons emerge. First, reimbursement of advanced nursing services is critical to move from pilot projects to full integration into routine care. Second, the design of reimbursement schemes, particularly the level of reimbursement rates (when they are paid fee-for-service) or the level of salaries of nurses taking up advanced roles vis-à-vis physicians, has an important impact on deployment and costs. Experiences in the United States and Australia have shown that when services provided by NPs were not reimbursed by insurers, it severely hampered patient access to services provided by NPs. In Australia, the enactment of the Medical and Pharmaceutical Benefits Scheme in 2010 removed a major barrier to NP practice. Lower payment and reimbursement rates for NP/APNs compared to physicians can reduce costs for payers, as demonstrated in the United States. Third, as many countries are shifting from fee-for-service payments for physicians to mixed payments (such as bundled payment systems or payments for episodes of care), payment systems are moving away from *individual* payments toward team- and performance-based payments, which may contribute to a greater deployment of advanced practice nurses and team work.

14. The use of financial incentives in two Baltic states, Estonia and Lithuania, in the form of "sticks" (reduction in capitation payments for GP practices not employing at least one family nurse working in advanced roles) or "carrots" (increase in payments for GP practices employing a second family nurses) has promoted a considerable increase in the employment of family nurses in primary care. It also helped

overcome the initial resistance of physicians. Hence, financial incentives have shown to be a promising strategy to incentivise a greater integration of new nursing roles into primary care in these countries.

15. In addition to regulation and financing policies, the uptake in practice also depends on the individual health care organisations. Clear understanding of the new roles of the nurses by health care managers and leadership support determine their uptake in each setting. The role of health care managers is critical to emphasise the added value of such new professional roles, and enable supportive work environment and management structures within the organisation.

The way forward: policy lessons

16. Many countries have introduced health workforce and regulatory reforms, often involving task-shifting, new tasks and/or re-allocation of responsibilities between professions. The feasibility and effectiveness of nurses taking up advanced roles has been established across a range of health systems. The extent to which advanced nursing roles have been fully integrated into routine health care services and scaled up depends upon the design of regulatory, educational and payment policies. Policy decisions are important as they can speed up or slow down the adoption of new roles.

17. Countries with the longest experience in integrating NP/APNs within their health systems include the United States, Canada, United Kingdom, Netherlands, Finland, Australia, New Zealand and Ireland. Policy lessons show that educational programmes (with expanded skills and competencies) in combination with up-to-date regulation is a pre-requisite for expanded clinical practice: without the official authorisation of new clinical activities defined in scopes-of-practice, nurses cannot practice in advanced roles officially and legally. Policy instruments exist, such as regular reviews of scopes-of-practice laws/policies (e.g. Netherlands), strategies to harmonise scope-of-practice in decentralised country contexts (e.g. Australia, United States), time-limited legal changes to test case expanded scopes-of-practice combined with a nationwide evaluation (e.g., an ‘experimental clause’ in the 2011 law in the Netherlands). Financing and reimbursement policies determine if advanced clinical activities will be reimbursed and at what level, which is critical in influencing the deployment of new roles and activities in practice. Finally, while policy-makers have tools to directly influence regulation and payment policies, the uptake at the organisational level can only be partly influenced: other organisational-level factors, such as leadership, change management and team culture determine the successful integration within individual health care organisations.

18. At the international level, several conclusions emerge. First, there is a need to standardise titles, ideally including minimum practice levels across countries to arrive at commonly agreed definitions. The lack of standardised international titles beyond the ICN general definition of NP/APNs, and the lack of (minimum) harmonised advanced practice levels impedes the recognition of NPs and other APNs at the international level. This will become a growing issue as the number of graduates rises globally and health professionals are more mobile. The International Standard Classification of Occupations (ISCO) may be a reference point for the development of harmonised titles, competencies and practice standards. This classification would need revisions to include a separate category for NPs and/or other Advanced Practice Nursing (APN) titles.

19. Second, there is a need for more regular data collection on advanced practice nursing internationally. Data availability on NPs and APNs is very limited at the international level. None of the international databases include NPs or other advanced nursing roles in their workforce statistics. The lack of international data and internationally recognised indicators hinders the monitoring of this workforce globally.

20. Third, there is a need to pursue more cross-country research and evaluations of policy reforms to identify systemic barriers and enablers to the uptake in practice, and intended or unintended effects. There are common barriers to overcome and policy levers that decision-makers can draw on, but these are rarely documented and shared. More high-quality policy and impact evaluations are needed not only at national levels, but also in certain regions - such as the European free mobility zone - and globally to improve evidence-informed policies and decision making.

1. INTRODUCTION

21. Countries worldwide are seeking to strengthen their primary care workforce to ensure everyone has access to high-quality health services. Universal health coverage has gained political momentum (United Nations, 2015). A strong primary care workforce plays a key role in maintaining or reaching this policy goal. Yet, many countries face workforce challenges in primary care. Although these are multifactorial and vary by country, they can be subsumed under provider or skills shortages, geographical imbalances, and efficiency and performance-related challenges. Primary care organisations are faced with increasing demands due to populations ageing, growing rates of chronic diseases and multimorbidity, often situated in fragmented health care systems (Nolte et al., 2014). New models of care have emerged, triggered by value-based payment models to improve coordination, integration and team work. Against this backdrop, the skill- and profession- mix of the health workforce is changing in many countries. New health professional roles are evolving, including among the nursing workforce (Delamaire and Lafortune, 2010, Pulcini et al., 2010, Kroezen et al., 2011).

22. This working paper seeks to synthesise the evidence on recent developments on advanced roles for nurses in 37 OECD and EU countries[1]. These include 36 countries[2] covered by a 2015 expert survey: Australia, Canada, New Zealand, the United States, all 28 EU countries, plus Iceland, Norway, Switzerland and Turkey (Maier and Aiken, 2016a). Moreover, Israel is also included based on recent literature (Aaron and Andrews, 2016). The working paper distinguishes two concepts of new, advanced roles: first, task-shifting[3] whereby nurses take up specific tasks from physicians; and second, task supplementation whereby nurses work in additional, complementary roles to physicians (Laurant et al., 2005). It provides an update to the 2010 OECD Health Working Paper on nurses in advanced roles (Delamaire and Lafortune, 2010).

23. The report comes at a time when strengthening human resources for health is receiving increasing levels of political attention globally. The High-Level Commission on Health Employment and Economic Growth, established in March 2016, released its report with global recommendations in September 2016. The report calls for actions to address the global workforce deficits, particularly in low-income countries, and to create new jobs and stimulate inclusive economic growth worldwide (United Nations, 2016). Moreover, the World Health Organization (WHO) has adopted a new Global Strategy in 2016 on Human Resources for Health (HRH) by 2030. The strategy sets the future direction on the health workforce globally to achieve universal health coverage and the health-related Sustainable Development Goals. One of the five areas for action relates to the workforce composition and skill-mix (World Health Organization, 2016b). The WHO has also adopted Strategic directions to strengthen nursing and midwifery in the European region in 2015 and globally in 2016 (World Health Organization Regional Office for Europe, 2015, World Health Organization, 2016a). This unprecedented level of global commitment stems from the recognition of the critical role health professionals play in health systems' performance, and the multiple workforce challenges that countries face.

[1] The 37 countries include all 35 OECD countries with the exception of Japan, Korea, Chile and Mexico.

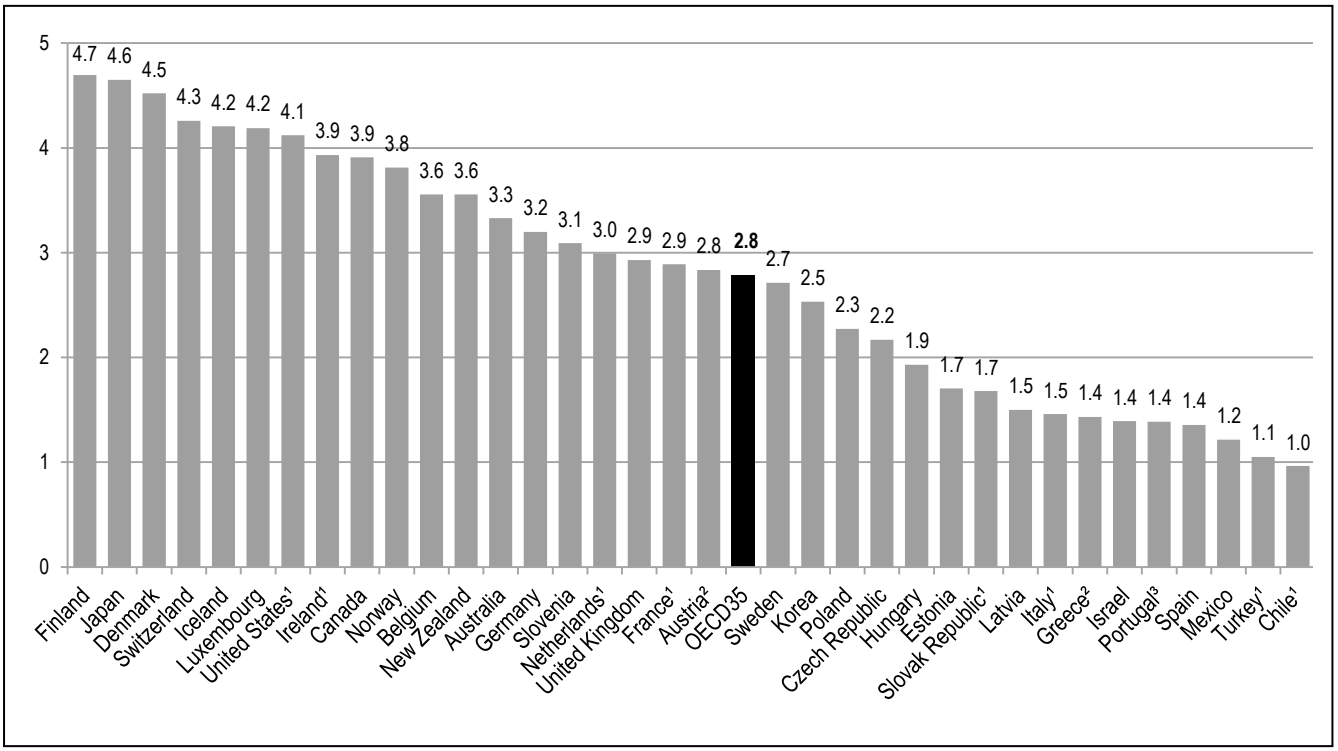
[2] The 2015 survey included 39 countries, counting England, Northern Ireland, Wales and Scotland separately. For the purpose of this working paper, England, Northern Ireland, Wales and Scotland are counted as one country (United Kingdom), hence 36 countries.

[3] A wide range of terms are used, often interchangeably, including task-shifting, task-sharing, task-reallocation or physician substitution, referring to nurses (and other providers) taking up activities that were traditionally reserved to the medical profession (WHO, 2007, WHO, 2008).

24. Common to many OECD countries is the shortage of health professionals in selected sectors such as primary care, or within certain regions, such as in rural and remote areas (OECD, 2008, Ono et al., 2014, Kroezen et al., 2015). The workforce is also changing. An increasing number of the baby-boom generation of physicians, nurses and other providers are reaching retirement age. A new generation (also referred to as Generation Y, born between 1980 and 1990) is entering the workforce with different priorities regarding work-life balance and tend to work less hours than previous generations. The medical workforce is increasingly female and more likely to practice part-time (Ono et al., 2014). Moreover, medical students are less likely to practice as General Practitioners (GPs) than in the past (Puertas et al., 2013). Many OECD countries are trying to reverse this trend with strategies to improve the attractiveness of family medicine/GPs and retention measures (Lee and Nichols, 2014, Ono et al., 2014). In addition, policy-makers are increasingly considering alternative workforce strategies, such as task-shifting and skill-mix changes, including strategies that expand the roles and clinical practice of – for instance – nurses.

25. OECD countries vary considerably in their workforce density, the rates of physicians and nurses per population, but also in the profession mix, as demonstrated by the ratio of nurses to physicians (Figure 1). The large cross-country variations may point toward different allocations of responsibilities and clinical activities across countries. However, little evidence exists on what activities nurses perform across countries, their specialisations, education and the size of nurses that work in advanced roles.

Figure 1. Ratio of Nurses per Physician in OECD countries, 2014 (or nearest year)



Notes: 1. For those countries which have not provided data for practising nurses and/or practising physicians, the numbers relate to the "professionally active" concept for both nurses and physicians. 2. For Austria and Greece, the data refer only to nurses and physicians employed in hospitals. 3. The ratio for Portugal is underestimated because the numerator refers to professionally active nurses while the denominator includes all physicians licensed to practice.

Source: OECD Health Statistics 2016, http://dx.doi.org/10.1787/health-data-en

26. The nursing profession is of particular interest since it is numerically the largest in all OECD countries. A driver is the increasing level of nursing education. Most OECD countries are in the process of reforming nursing education and have moved the primary nursing education fully or partially to Bachelor levels (Lahtinen et al., 2014). In the United States, the proportion of nurses who graduated from four-year Bachelor programmes has considerably increased since 2000, reaching over 50% in 2014 (Buerhaus et al., 2016). In Canada, 53% of registered nurses had a university degree in 2015 (of which 48% had a Baccalaureate and 5% a Master's/Doctorate degree), up from 33% in 2006 (Canadian Institute for Health Information, 2016).

27. In Europe, changes in the education of nurses were triggered by the Bologna process, introduced in 1999. Of 45 countries, the majority (82%) are offering nursing education leading to a bachelor's degree or equivalent, yet some countries still have diploma-level education co-existing. Moreover, 60% offer a full academic cycle of Bachelor, Master and Doctorate degrees (Lahtinen et al., 2014).

28. While countries in the past have often relied on GPs working primarily in solo-practices, primary care models are diversifying. New service delivery models include group practices, health centres, integrated care programmes or provider networks (Nolte et al., 2014). Although highly diverse, most models aim to strengthen the coordination of care, while involving multi-disciplinary teams and different skill-set requirements. The new generation of physicians is more favorable towards team work and therefore, may be more open to other professions taking up new responsibilities, although change is slowly happening (Maiorova et al., 2007).

29. Economic considerations, and cost pressures in particular, also act as driver to evaluate the skill-mix of a country's health workforce. In Europe, health spending has stagnated or decreased in real terms in many European countries since 2008, contrary to earlier years of steady increases (OECD/EU, 2016). The economic crisis affected the workforce in various ways and resulted in salary freezes, salary cuts or lower staffing levels (Karanikolos et al., 2013). The World Health Organization has identified costly skill-mix of health professions as one of the top causes of inefficiency in health systems (Chisholm and Evans, 2010).

Definitions of nurses in advanced roles

30. Nurse role advancement can take many forms. In this working paper, a broad approach is taken, subsuming two concepts: task-shifting and task supplementation. Task-shifting was defined by the WHO as nurses or other non-medical professions taking up clinical activities traditionally performed by physicians (World Health Organization, 2007, World Health Organization, 2008). Task supplementation refers to nurses taking up clinical roles that did not or only marginally exist before, such as additional roles in coordination, eHealth-supported monitoring or case management, thereby *complementing* existing roles (Laurant et al., 2005).

31. To account for the broad conceptual approach, we define nurses in advanced roles as "*nurses working in advanced roles beyond the traditional registered nurses' (RN) scope-of-practice, after additional training*" (Maier and Aiken, 2016a). Moreover, we identified countries with and without NPs/APNs, an umbrella term by the International Council of Nurses (ICN). According to the ICN, "*A Nurse Practitioner/Advanced Practice Nurse is a registered nurse who has acquired the expert knowledge base, complex decision-making skills and clinical competencies for expanded practice, the characteristics of which are shaped by the context and/or country in which s/he is credentialed to practice. A Master's degree is recommended for entry level*" (International Council of Nurses, 2002). While this definition is widely used in the literature and internationally recognised (International Council of Nurses, 2002), the extent of advanced clinical practice as per scopes-of-practice has received less attention in cross-country comparisons.

32. Hence, we complemented the ICN umbrella definition with additional information on scopes-of-practice (Table 1). Within the NP/APN category, we further differentiated between NPs and APNs. The reason is that in some countries, such as Ireland, New Zealand or Australia, NPs are generally working in more advanced clinical and leadership roles than other APNs, such as Clinical Nurse Specialists (Begley et al., 2013).

Table 1. Nurses in advanced roles: titles, scopes-of-practice and education

Nurses in advanced roles?	NP/ APN level	Sub-groups /-specialisation	Titles	Scope-of-Practice (SoP)	Education
Yes	Yes	Nurse Practitioner (NP)	NP, Advanced NP, or similar title	Advanced SoP: high level of advanced clinical practice°	Master-level*
		Other Advanced Practice Nurses (APN)	Clinical Nurse Specialists, others	Advanced SoP: high level of advanced clinical practice°	Master-level or other postgraduate education*
	No	Various other nursing roles or (sub-) specialties with additional training	Vary, include family nurses, reference nurses, other titles	Some elements of advanced SoP, but not at NP/APN level	Additional training/ education beyond RN education
No	No	RN, professional nurse	RN, professional nurse	'Traditional' SoP of RNs in country context	RN nursing education

Notes: SoP=Scope-of-Practice, NP=Nurse Practitioner, RN=Registered Nurse, *exceptions may exist, depending on country-contexts (e.g. transitional arrangements, other education defined as equivalent in respective countries), °as a proxy, the following seven clinical activities may be used as per International Council of Nurses: prescribing authority, diagnosis/advanced health assessment, authority to order medical tests & exams, authorised to decide on treatments, responsibility for a panel of patients, first point of contact, authorised to refer patients to other providers/settings.

Source: authors' synthesis, further developed from International Council of Nurses (2002), Maier and Aiken (2016a)

33. This working paper is based on an expert survey in 36 countries, based on input from over 90 experts, a literature review, and an analysis of data on NPs from selected OECD countries. (Maier, 2015, Maier and Aiken, 2016a, Maier et al., 2016). Moreover, the working paper provides country examples including 'snapshots' of the diversity and significance of advanced nursing roles in primary care, but it does not claim to be a full, exhaustive overview.

34. The remaining of this working paper is structured as follows: Section 2 highlights the various advanced roles in which nurses work across OECD countries. Section 3 assesses the data availability, quality and size of nurses in advanced roles, focusing as an example on NPs in selected OECD countries. Section 4 takes a policy and organisational perspective to the introduction of advanced nursing roles and highlights common barriers and enablers to practice uptake in primary care. Section 5 synthesises the evidence on the effectiveness and efficiency of advanced nursing roles. Section 6 concludes by providing policy lessons and options to consider when introducing new roles, implementing reforms or making mid-course corrections.

2. STATE OF ADVANCED NURSING ROLES: DEVELOPMENTS, EDUCATION, VARIABILITY IN PRACTICE

35. This section takes stock of advanced nursing roles in OECD and EU countries. It provides both cross-country analyses and brief country-specific snapshots on the roles, level of advanced practice and education. The section aims to show both the commonalities as well as the diversities of nurses taking up new roles in primary care. Nurse prescribing is presented as one important example of expanding nursing practice, a reform that many countries have embarked on in recent years.

2.1. Nurse practitioners and other advanced practice nurses are emerging in the majority of OECD countries, but often at early stages

36. The United States and Canada have the longest tradition with NPs and other advanced practice nursing (APN) roles dating back to the mid-1960s (Martin-Misener et al., 2010). Other countries began introducing APN roles later on, such as the Netherlands in 1997, Australia in 2000, Ireland and New Zealand in 2001 and Finland in 2003. At early stages of NP/APN role development are Austria, Belgium (Flemish part), Croatia, Cyprus, France, Germany, Iceland, Lithuania, Sweden, Norway, Switzerland, Israel, among others, which have either a young history of establishing education programmes at universities or universities of applied science or have implemented pilot and small-scale projects (Aaron and Andrews, 2016, Maier and Aiken, 2016a).

37. In a 2015 survey, Australia, Canada, Finland, Ireland, Netherlands, New Zealand, the four parts of the United Kingdom (England, Northern Ireland, Wales, Scotland), and the United States had NPs and/or other APN roles existing and were authorised to work at high levels of advanced practice in primary care as per scopes-of-practice (see table 2). In these countries, extensive task-shifting had occurred, combined with regulatory reforms leading to a considerably expanded practice level.

Table 2. NP/APN education and advanced practice in selected OECD and EU countries in primary care, 2015

	Countries	NP/APN education	Advanced Clinical Practice (in primary care), as per SoP
Established: NP/APN working at high levels of advanced clinical practice	Australia, Canada, Finland, Ireland, Netherlands, New Zealand, United Kingdom (England, N. Ireland, Scotland, Wales), United States	✓	✓ Authorised to perform all of the following seven clinical activities: •Prescribing medications •Medical diagnosis & health assessment •Ordering medical tests & exams •Treatment decisions •Panel of patients •Authorised to refer patients •First point of contact
Emerging: (few) NP/APN education programs, but practice not at advanced clinical level	Austria, Belgium°, Croatia, Cyprus, France, Germany, Iceland, Israel, Lithuania, Norway, Spain, Sweden, Switzerland	(✓) Emerging*	(✓) Level of advanced clinical practice is more restricted than above, authorised to perform a limited set of advanced clinical activities, usually under physician oversight
Other extended nursing roles, but practice nor education at NP/APN level	Belgium°, Czech Republic, Denmark, Estonia, Hungary°°, Italy, Latvia, Luxembourg, Malta, Poland, Portugal, Slovenia	No**	(✓) Limited advanced clinical practice, authorised to perform a limited set of clinical activities, usually under physician oversight

Notes: SoP=Scope-of-Practice, *Few or recent NP/APN programmes established at universities or universities of applied sciences **No NP/APN education programmes, but additional specialisations and trainings for nurses. °Belgium (Flamish part with APN

education, French part without)°°Hungary is in the process of implementing APN educational programmes (as of 2017), No advanced nursing roles as per the seven advanced clinical activities in primary care were identified in Bulgaria, Greece, Romania, Slovakia, Turkey.

Sources: authors, based on and developed from the 2015 TaskShift2Nurses survey (Maier, 2015, Maier and Aiken, 2016a), with additional information obtained from country experts. For Belgium, sub-national information was added from country experts; for Israel, the information is based on Aaron and Andrews (2016).

38. Among the countries with established NP/APNs, details and levels of independence vary. For instance, prescribing authority ranges from limited prescribing rights of few medications or continuing prescribing only, to full prescribing authority including controlled drugs. Moreover, levels of independence range from full independence to various levels of physician oversight (Maier and Aiken, 2016a). Despite these differences, the countries have in common that NP/APNs work at high levels of advanced practice in primary care practices, multidisciplinary teams or other collaborative service delivery models.

39. In addition to the eight countries with established NP/APN level practice and education, developments and policy reforms are ongoing in a second group of countries where new roles have emerged, and education of NP/APNs is often in early stages as is the uptake in practice (table 2). Box 1 provides an overview of recent policy developments in France. In this second group of countries, the length and contents of educational programmes, the curricula, specific clinical skills and competencies vary considerably. For example the skills and competencies taught to diagnose and perform advanced health assessments vary (if at all covered), as well as the extent of knowledge on pharmacology, prescribing or pathophysiology. Moreover, the level of officially authorised practice (as per scopes-of-practice) varies considerably, is not at the same level as in the first group of countries and usually performed in a delegated model under physician oversight.

Box 1. Country snapshot: Recent developments in France to enable advanced roles for nurses

Advanced nursing roles in France have evolved incrementally and slowly over the past due to various barriers, such as a restrictive legal framework on nurses' scope-of-practice and a strong opposition by medical associations. However, the legal context has changed in France recently. In January 2016, a new Act on modernising health care was adopted, establishing so-called « medical auxiliaries » in advanced roles (French Government, 2016). This new law opens up the way for more legal autonomy of paramedical professionals including nurses, especially for the routine follow-up of patients with chronic conditions. The law authorises the possibility to adapt medical prescriptions and to renew medical prescriptions. This expanded clinical practice applies to approximately 3% of the nursing profession. The legal change has been made possible due to various factors, including the evolution of the National Council of French physicians' position toward a more favourable opinion and the general support of the French authorities. Moreover, pilot projects experimenting with new roles for nurses in primary care in collaboration with GPs (such as ASALEE[4] or SOPHIA[5]) showed the positive impact that more advanced practice nursing could play in the management of chronic conditions, such as for diabetes. The ASALEE model has multiplied since 2012 and is now covering 14 regions, whereas the SOPHIA model covers all of France for patients with diabetes and 18 regions for patients with asthma. The models have demonstrated positive results in expanding access to patients, and improving the effectiveness and quality of care (Mousques et al., 2010).

40. Finally, a large group of countries exists that shares the commonality to have expanded the roles of nurses in specific areas, but neither practice nor education is as advanced as in the first or second group of countries. In this group of countries, many of the nurses focus on specific, often chronic diseases in supplementary roles, such as monitoring, education or providing lifestyle advice and adherence support. Examples of the various roles that nurses can take up are provided in section 2.3.

[4] *ASALEE: Action de santé libérale en équipe (self-employed health workers working in team)*

[5] *SOPHIA: Service d'accompagnement pour mieux vivre avec une maladie chronique (follow-up services to live better with a chronic condition)*

2.2. Educational programmes are rapidly increasing

41. In the countries with established NP/APNs and high levels of advanced practice (Group 1), educational requirements of NP/APNs have almost entirely moved to the Master level (or post-graduate education). In Australia, Canada, Ireland, Netherlands,New Zealand and the United States, Master programmes are mandatory and include advanced courses on physical assessment skills and competencies, physiology and pathophysiology, and advanced pharmacology, among others. Other countries still have transitional arrangements, albeit a Master level degree has become the most common form of education, particularly for NPs.

42. In those countries where NPs/APNs are emerging (Group 2), the number of graduates are often low and have not (yet) led to considerable changes in scope-of-practice, if any. Sweden has established an APN education programme at two universities in 2003 (*Avancerad primärvårdssjuksköterska*), of which one programme focuses on primary care (120 ECTs, 2-year full-time Master, at University of Skoevde). As of 2015, only 25-30 advanced nurses have graduated and scope-of-practice is generally not different from district nurses for instance.

43. In Switzerland, APN education has evolved over the past ten years. The University of Basel was the first university in German-speaking countries to implement an APN Master programme with a clinical focus. As of 2015, 328 APNs have graduated holding a Master of Science (MSc) in Nursing with a clinical focus, with almost all graduates working in hospitals. APNs working in primary care are rare, but slowly emerging. One GP group practice for instance has employed two APNs in chronic care management. Educational programs are emerging in primary care, one of which started in 2013 in geriatrics and chronic disease management.

44. In Austria, Belgium (Flemish part), Germany, France, Iceland, Lithuania and Norway, Master's (or sometimes Bachelor's) programmes called APN have been introduced. Their clinical focus and curricula, however, varies considerably within and across countries. In France for instance, an additional two-year training at universities has been introduced for nurses to work in advanced roles, which will be further strengthened by the 2016 Act on modernising health care (French Government, 2016). The 2016 Act and subsequent decrees will officially specify the nursing degree needed to work in advanced practice and are expected to contribute to clarifying legal responsibility in practice (see Box 1). Germany and Austria have introduced pilot or small scale projects often in rural regions to test limited task-shifting from physicians to nurses or medical assistants after additional training, yet, implementation into routine care is at early stages or focused on certain regions only.

2.3. Variability of roles is high and reflects population needs and local contexts

45. Nurses working in advanced roles take many forms. This section provides a snapshot of the various advanced nursing roles which exist in primary care. We provide an overview of NP/APN specialty and practice areas in selected OECD countries. Country examples are highlighted in three areas: first, nurses working as generalists in primary care, second, nurses focussing on public health, screening and other prevention activities, and third, nurses specialising in the management of specific chronic conditions. Many (sub-)specialisations exist, hence roles are often not clear cut, practice areas vary and can be of multiple foci.

Responding to shortages: Nurses working as "generalists" in primary care to fill gaps

46. NPs working as generalists in primary care have often evolved in response to physician shortages, as demonstrated in the Australia, Canada, New Zealand and the United States. Various NP specialisations or specialty areas exist (see table A1, Appendix). Examples of NPs that come closest to the

scope of work of GPs in primary care include *adult health* in the United States, *adult health and primary health care* in Canada, *community and primary care* in Australia or *lifespan primary health* in New Zealand. Work settings include group practices, health centres, nurse-led clinics or outpatient clinics or private practice. The roles are broad and cover a wide range of different (undifferentiated) illnesses and conditions in primary care. Examples in countries such as Canada and the United States show the range of clinical activities of NPs in primary care, which vary by provider setting, geographical location and patient needs (Box 2 and 3).

Box 2. Country snapshot: Adult NPs working in retail clinics and other provider models in the United States

In the United States, NPs work in a variety of different primary care settings, including in physician practices, community health centers, nurse-led clinics, provider networks, retail clinics or as independent providers. NPs have shown to be more likely to work in rural areas or other professional shortage areas than physicians, and treat a higher number of disadvantaged beneficiaries (DesRoches et al., 2013). They can therefore ease geographical imbalances, alleviate shortages and improve access to care for vulnerable groups.

An innovative provider model that has emerged in the United States over the last 15 years are retail clinics. Retail clinics are typically staffed by NPs and located in pharmacies or supermarkets. They offer convenient access on a walk-in basis, often during week-ends and after-hours. Services cover common minor illnesses, preventive care and treatment of stable chronic conditions. Established first in 2000, the number of retail clinics has increased considerably since then. A total of 5.9 million clinic visits were reported in 2009 alone (Mehrotra & Lave, 2012). As of 2015, there were approximately 1,900 retail clinics in the United States, and anticipated future growth is high (Chang, Brundage, & Chokshi, 2015). Retail clinics can contribute to cost savings: patients who received care for minor illnesses at a retail clinic had lower costs per episodes of care than patients receiving care in other primary care settings (Spetz et al., 2013).

Box 3. Country snapshot: NPs in rural practices in British Columbia, Canada

The NP role has been implemented at different speed throughout Canada's provinces and territories. In British Columbia, based on an in-depth analysis of three rural collaborative practices where NPs were newly employed, patient access was improved and contributed to enhanced team work. NPs took more time and a more holistic approach for their patients than GPs, including for high-need patients with HIV/AIDS, mental health conditions, or frail elderly with chronic conditions. On average NPs provided 20-30 minute consultations per patient instead of 10 minutes by GPs. NPs used the extra time for health promotion advice, disease prevention, assessments of complex situations and case management. In addition, NPs often introduced a new, community- and population-based focus to their practices. Activities provided by NPs included outreach activities outside the office to marginalised populations, which was not previously done by GPs. These add-on services were appreciated by colleagues, and improved physician job satisfaction. Moreover, emergency use and admission rates to hospitals declined (Roots & MacDonald, 2014).

47. Reasons for advancing the roles of nurses in primary care have also evolved out of the need to improve care for population groups, including socio-economically disadvantaged groups, or for high-need patients after hospital discharge. One example is the development of acute care nurses in some communities in Denmark to improve care of patients newly discharged and to avoid re-hospitalisation. In Spain, a relatively young specialisation exists since 2011, the family and community nurse (*Especilidades enfermeras: familiar y comunitaria*). By 2014, approximately 800 nurses had obtained this specialisation which includes a broad coverage of primary care services for individuals, families and communities.

Scaling up prevention: nurses focusing on health promotion and prevention

48. Health promotion and prevention activities are increasingly transferred partly or fully from physicians to nurses, particularly for individual patients. Nurses with additional education or training are responsible for health promotion advice and lifestyle counselling, population screening programmes, or adherence support and educational programmes to individual patients with chronic conditions. In Ireland

and the United Kingdom, public health nurse specialists exist with various roles in preventive care. In the Netherlands, Nurse Specialists (*Verpleegkundig Specialisten*)[6] can specialise in preventive care as one of the five official specialisations. In Italy, Poland, and Slovenia, family or community nurses play a major role in the prevention of diseases, health promotion for specific population groups or secondary and tertiary prevention activities for patients with chronic conditions, usually in collaboration with GPs. In Hungary, health visitors perform a range of preventive services; moreover, their role was expanded in 2010 to cover cervical cancer screening in order to improve screening rates (see box 4).

Box 4. Country snapshot: advancing health visitors' scope-of-practice in Hungary to expand access to cervical cancer screening

Hungary has implemented organised, personalised, invitation-based cervical cancer screening in 2003. At that time, this screening was performed solely by gynecologists, who had been the gate-keepers of screenings for years, contrary to international recommendations by the European Commission Council Conclusions (2003/878/EC, based on WHO/IARC recommendations). Due to limited access to gynecologists, screening participation rates remained low at only 10% until 2010, with particularly low rates in rural areas. In order to expand access to screening, the scope-of-practice for "health visitors" was expanded in 2010 (Döbrőssy et al., 2013). Health visitors – also called public health nurses – are qualified to provide health promotion advice, health check-ups, immunisation, screenings and preventive care to women, newborns, school children and adolescents. Since 2010, health visitors are authorised to perform cervical smears after having successfully completed additional training and being licensed to perform this activity. The number of health visitors trained has rapidly increased in recent years, from 250 in 2014 to 1,400 in early 2016. Screenings are now performed by health visitors in rural areas where access is limited. Integrating the knowledge, skills and competencies into the regular health visitor education curriculum (BSc) is ongoing to scale up workforce capacity and access to cervical cancer screening (Döbrőssy et al., 2015).

Improving chronic care: nurses working in supplementary roles focussing on specific chronic conditions

49. The majority of OECD countries have introduced nurse specialisations and advanced their practice profile into new clinical areas – often in supplementary roles – to better respond to the growing number of people living with chronic conditions. A large number of countries rely on diabetes specialist nurses to provide care, monitoring and self-management support. Examples include Belgium, Denmark, Germany, Lithuania, Luxembourg, Netherlands, New Zealand, Poland, Slovenia, and Sweden, among other countries (Boström et al., 2012, INAMI Institute Nationale d'Assurance Maladie Belgique, 2014a, Wilkinson et al., 2014, Due-Christensen et al., 2015). Box 5 provides an overview of reforms that incentivised and strengthened the role of certain groups of nurses, such as diabetes educator nurses in Belgium.

50. Nurses undergoing specialty training in oncology, such as breast cancer; or other chronic conditions including cardiovascular diseases, are frequent. Nurses with such specialisations are usually responsible for the management, treatment and secondary prevention of stable chronic patients (Loveman et al., 2003, Houweling et al., 2011). These tasks are time-consuming and therefore often delegated or fully shifted to nurses if trained with the required advanced skills- and competencies.

[6] Also sometimes referred to as NPs in the English literature (we kept the direct translation since this title is protected).

Box 5. Country snapshot Belgium: yearly premiums to selected groups of nurses focussing on patients with chronic conditions in primary care

In primary care, Belgium has put a financial mechanism in place incentivising certain clinical activities for patients with chronic conditions, such as more time for patient education, if performed by specially trained nurses. Although all nurses are officially authorised to perform these activities, only those who are specially recognised as having the skills and expertise are allowed to directly bill for these services at patients' homes and may receive a premium. Of the total of twelve nurse specialisations and five nursing expert roles recognized in Belgium, five groups of specialised nurses (ICU-ER, Geriatry, Oncology, Neonate-Pediatry and Psychiatry-Mental health) and three nursing expert roles (Geriatry, Psychiatry-mental health and Diabetology) can receive an additional yearly premium of about €1,200 (specialised) or €500 (nursing expert role).

Since 2013, this premium has been added to nurses' salaries, e.g. for diabetes educator nurses on the condition that certain diabetes education activities are provided (e.g. a coordinated patient plan for patients with diabetes, and a minimum number of clinical activities for patients with diabetes at a given scale and threshold). If these activities do not reach the minimum threshold points, the premium is adjusted downward on a pro rata basis (INAMI Institute Nationale d'Assurance Maladie Belgique, 2014a, INAMI Institute Nationale d'Assurance Maladie Belgique, 2014b). This incentive has led to an increased awareness and an increased emphasis on coordinated care, education and monitoring to improve the care for patients with diabetes.

51. The increase in advanced nursing roles with a single-disease focus and largely working in supplementary roles, evolved as a response to the time-intensity in supporting and monitoring patients on a regular basis, particularly for patients with stable, chronic conditions. There are several systematic reviews suggesting the benefit of nurse-provided chronic care on the grounds of at least equivalent or improved quality of care and higher patient satisfaction (see Section 5 on Evaluations).

2.4. Nurse prescribing of pharmaceutical drugs exists in fifteen countries

52. Health care reforms on nurse prescribing have been implemented in a rapidly increasing number of countries over the recent past (Kroezen et al., 2012, Maier and Aiken, 2016a). Between 2010 and 2015, six countries, Cyprus, Estonia, Finland, Netherlands, Poland and Spain have *newly adopted* laws to enact prescribing authority for nurses meeting pre-defined requirements (Maier and Aiken, 2016a), whereas France adopted a new law in 2016 which is pending adoption of the relevant decrees to specify implementation (French Government, 2016). Moreover, since 2010, other countries, such as Australia, Canada, Ireland, New Zealand, the four parts of the UK, and the United States have *expanded* existing prescribing authority or adopted laws and policies to remove barriers to practice. Denmark and Sweden authorised limited nurse prescribing prior to 2010. This section describes country experiences in introducing or extending nurse prescribing authority and the related educational and regulatory requirements.

53. As of January 2017, fifteen countries covered in this report have adopted some form of prescribing authority for nurses. These countries are Australia, Canada, Cyprus, Denmark, Estonia, Finland, France (law adopted, decrees pending), Ireland, the Netherlands, New Zealand, Poland, Spain, Sweden, the four parts of the United Kingdom and the United States. Prescribing authority for nurses is typically highly regulated, but varies considerably in what groups of nurses qualify, the extent of prescribing authority, and the educational and oversight requirements.

54. Differentiating between who within the nursing profession is allowed to prescribe medications and which medications is critical as to the width and depth of prescribing practices. The width of nurse prescribing defines the number of nurses allowed to prescribe. For instance, authorising prescribing authority for <u>all</u> registered nurses who meet the requirements would expand access to a larger group of nurses than if restricted to NP/APNs. Second, the depth of prescribing authority is determined by the

number of medications, and type of prescribing, ranging from independent initiation of a full set of medications to continued prescribing of a small number of medicines.

55. Countries have taken two pathways as to what group(s) of nurses to grant prescribing rights: either open to all registered nurses meeting pre-defined requirements, or restricted to specific regulated sub-groups of nurses only. In terms of the extent of nurse prescribing, some countries have enacted full prescribing authority, whereas others authorise only limited nurse prescribing, either based on an agreed formulary or based on protocols (Table 3).

Table 3. Overview of nurse prescribing authority by country

Prescribing authority restricted to specific, regulated nursing titles/sub-groups of nurses		Prescribing authority for all registered nurses meeting requirements	
*Full prescribing authority**	*Limited prescribing authority***	*Full prescribing authority**	*Limited prescribing authority***
• **Australia** (NP) • **Canada** (NP) • **Netherlands** (Nurse Specialist) • **New Zealand** (NP) • **U.S.** (NP, other APRN)	• **Australia** (scheduled medicines RN) • **Cyprus** (Master's level APN) • **Netherlands** (diabetes care nurses, lung nurses, oncology nurses with Bachelor level) • **Poland^** (Master and Bachelor level nurses) • **France^** ("medical auxiliaries")	• **Ireland** (Registered Nurse Prescribers) • **UK (England, Northern Ireland, Scotland, Wales)** (Independent Prescribers)	• **Canada** *(emerging°°)* • **Denmark°** • **UK (England, N. Ireland, Scotland, Wales** (Supplementary Prescribers) • **Estonia^** • **Finland** • **Spain^** • **Sweden** • **New Zealand**

Notes: *Includes a full or broad range of medications as part of the specialty area, may include restrictions on (certain) controlled drugs **Includes a limited number of medications, restricted by a formulary or protocols in place, some sort of physician oversight is required. ^=laws / government decisions adopted in 2015/2016, implementation in progress; °In Denmark, nurse prescribing exists primarily in hospital settings as part of frame prescriptions, in primary care it depends on the individual GPs; °°In Canada, a broadening of prescribing authority to all RNs meeting the specific requirements is currently in development in several provinces, including British Columbia, Alberta, Manitoba, Saskatchewan, Quebec and Newfoundland and Labrador.

Sources: TaskShift2Nurses Survey 2015, Maier and Aiken (2016a), Kroezen et al. (2012), French Government (2016)

56. In Australia, Canada, Netherlands, New Zealand, and the United States, NPs are granted full or nearly full prescribing authority. These countries chose to restrict nurse prescribing to a defined, highly educated and regulated group of nurses. NPs in these countries are granted high levels of prescribing authority, covering all or nearly all medications within their specialty, often including certain controlled drugs. The skills and competencies are taught in pharmacology, pathophysiology, diagnostic and health assessment and other courses as part of the Master's-level programmes. In most countries, NPs are automatically granted prescribing authority after having successfully completed clinical Master's level education. This pathway into prescribing authority dates back to the 1970s and 1980s, where NPs in a few U.S. states, such as North Carolina, New Hampshire, Alaska, and Missouri, were the first to be granted prescribing rights (Kroezen et al., 2012).

57. Australia, the Netherlands and New Zealand have enacted laws to allow other regulated nurse specialisations to prescribe certain medications, but restricted prescribing through formularies, protocols or other measures. In Australia, so-called *Scheduled Medicines RNs (Rural and Isolated Practice)* administer

and supply a limited set of medicines in rural and remote settings to improve access to medicines. These medications are defined by a formulary, and require a health management protocol with the employer, as part of multidisciplinary teams (Nursing and Midwifery Board of Australia, 2010). The Netherlands has granted limited prescribing rights for diabetes care nurses, lung nurses and oncology nurses.

58. In Poland, a new law on prescribing authority was adopted in 2015, and entred into effect in 2016. Master- and Bachelor- level nurses (and midwives) are authorised to prescribe from a list of medicines. Levels of independence range from autonomous prescribing for Master-level graduates to continued prescribing for Bachelor-level graduates. It is estimated that nurses in Poland will prescribe 20% of all medicines for patients with chronic diseases and 10% in outpatient specialist care in the near future, thereby easing access to medicines for patients and reducing pressure on physician's work load (Binkowska-Bury and Więch, 2016). In France, the 2016 law has opened the door for continued prescribing of medicines by a small group of nurses, so-called medical auxiliaries, yet further details are pending adoption of the decrees as pre-requisite for implementation (French Government, 2016).

59. A second pathway to nurse prescribing was introduced in the mid-1990s in the four parts of the UK and in Sweden, where prescribing authority was opened to all registered nurses who have completed additional training and meeting the requirements. Countries that followed this pathway include Ireland in 2007, Denmark in 2009, Finland in 2011, and most recently, Estonia, Spain and New Zealand in 2015. Ireland and the four parts of the UK are the only countries that have granted full or nearly full prescribing authority for nurses within their specialisation, if qualifying as "registered nurse prescribers" (Ireland) and "independent prescribers" (UK-wide) (table 3, table A2 in Annex). All other countries have granted limited or very limited prescribing rights. In the four parts of the United Kingdom, in addition to "independent prescribers", a second, more restricted model exists, the "supplementary prescribers" who are entitled to prescribe only the medicines listed in a patient-specific clinical management plan, in partnership with a physician.

60. Countries with limited prescribing rights include Denmark, Estonia, Finland, Spain, Sweden and New Zealand. Canada is in the process of expanding the possibility for all RNs meeting certain requirements to prescribe some pharmaceutical drugs, although there are variations across provinces. In Sweden, registered nurses, after having successfully completed courses in pharmacology and pathology, can prescribe a limited number of medications in fifteen areas, including mouth and throat illnesses, stomach and intestinal problems, nutrition-related problems, and wound treatment (Swedish National Board of Health and Welfare, 2015). In Denmark, limited prescribing authority exists in the form of so-called "frame prescriptions" primarily in hospital settings requiring prior physician approval. In primary care it is less common: individual GPs decide if they set up such frame prescriptions with their employed nurses (Ministry of Health Denmark, 2009). In Spain, registered nurses meeting the requirements can prescribe medications as part of clinical practice guidelines under physician oversight, whereas they can prescribe over-the-counter medicines independently (Ministry of Health; Social Services and Equality Spain, 2015). Estonia and Finland have established formularies from which nurses can prescribe: the list of medicines is focused on common medications prescribed for minor acute illnesses and continued prescribing of chronic conditions. Table A2 (Annex) provides an overview of nurse prescribing, laws and requirements per country.

61. All countries have determined minimum educational and/or collaborative requirements to authorise nurse prescribing, defined in laws, bylaws or other regulatory mechanisms. The requirements vary: at minimum, these include the successful completion of a course on pharmacology of various length (e.g. 6 ECTS in Spain and Cyprus or 45 ECTS in Finland), the registration or certification as nurse prescriber and some sort of collaborative or supervisory agreement with physicians and/or their employers. In addition, the majority of countries require relevant previous work experience.

62. In summary, the extent of prescribing authority, levels of decision-making, and supervisory requirements vary considerably across countries, but also within countries with devolved governance structures. Fully independent prescribing practice is officially authorised in 22 U.S. States (plus Washington D.C.), in the Netherlands and New Zealand (van Meersbergen, 2011, Parliament of New Zealand, 2013, Kroezen et al., 2014a, Phillips, 2016). In other countries, such as Australia and the remaining 28 U.S. States, some sort of physician oversight is required for NPs to practice, often through collaborative agreements or other arrangements (Cashin, 2014, Phillips, 2016). Common to all countries are the adoption of major reforms to grant nurse prescribing in order to ease access for patients to medications, particularly for patients with chronic conditions or minor acute illnesses

63. While an increasing number of countries have adopted laws on nurse prescribing, the implementation in practice varies depending on the years in which these reforms were adopted and several other factors. Countries with a young existence of prescribing authority face a number of implementation challenges. These range from establishing the education structure and programmes to provide nurses with the new skills, acceptance among patients and other providers. Contributing factors also include the confidence among nurses to prescribe, overcoming initial opposition by medical professions or other opposing forces, and a lack of payment structures among health insurers preventing the reimbursement of these services by the nurses (Kroezen et al., 2014b).

64. In the Netherlands, where a new law entered into force in 2012 authorising prescribing for nurse specialists, a study found that prescribing practices among nurse specialists varied considerably depending on the individual hospital setting, team and individual nurse (Kroezen et al., 2014a). Variations existed in the range of medicines prescribed, and the degree of independence in prescribing. Moreover, individual hospitals had their own governance requirements. Some required nurse specialists to obtain permission from the hospital board of directors, which is not required by the Dutch law.

65. In Australia, a 2010 national survey found large variations in the levels of NPs' confidence in prescribing medications. One of the factors was related to the years of practice. NPs with little prior experience were significantly less confident in prescribing. This highlights the need to improve mentoring or other induction and support programmes, as well as continuous professional development (Cashin et al., 2014). Similar results were also found in New Zealand (Wilkinson et al., 2014).

66. Hence, laws enacting prescribing authority and educational preparation of nurses to perform this activity are necessary to authorise nurse prescribing, but do not automatically lead to a full uptake in practice. A mix of country-specific and organisational-level governance mechanisms are required to enable safe nurse prescribing (See Section 4).

3. DATA ON NURSES IN ADVANCED ROLES

67. This section takes stock of the availability and quality of data on nurses in advanced roles with a focus on NPs in selected OECD countries. It provides an overview of the size of NPs in the countries where this role has been established, including data availability on primary care work settings. The section concludes with suggestions to improve data availability in order to enhance the monitoring and planning of advanced nursing roles in OECD countries.

3.1. Data availability improves when titles are regulated and registration is mandatory

68. Of the countries in which NPs are recognised as a profession and work at high levels of advanced practice, six countries – Australia, Canada, Ireland, Netherlands, New Zealand, and the United States – have routine data on the NP size available from registries or other administrative sources at national or subnational level (Maier et al., 2016). The fact that NP is a regulated title in these countries and registration, licensing or endorsement as NP is mandatory, are the primary reasons that data are available. Canada has the most detailed data, including time series data, and data of NPs by place of work, covering all three activity levels: practicing, professionally active and registered NPs (Canadian Institute for Health Information, 2016). In the United States, several data sources exist that measure the NP workforce differently, particularly NPs working in primary care (Spetz et al., 2015, Maier et al., 2016). In the United Kingdom, no routinely collected statistics exist on NPs, neither at a UK-wide level nor in England, Northern Ireland, Scotland or Wales individually. The fact that the title NP per se is not regulated, nor is registration as NP required with the UK Nursing and Midwifery Council limits data availability. The only information available is statistics on nurses with prescriptive authority, since this function is regulated and requires mandatory registration.

3.2. The size of the NP workforce varies across countries, but is consistently growing

69. The size of the NP workforce is highly variable across the six countries for which data are available. In 2015, the total number of NPs ranged from over 170,000 NPs in the United States to less than 150 in New Zealand and Ireland (table 4). Similarly, the share of NPs compared with all Registered Nurses (RNs) also varied, being the highest in the United States (where NPs were first introduced in the mid-1960s) with NPs representing more than 5% of all RNs, and the lowest in Australia, New Zealand and Ireland (where NPs were only introduced in 2000/01) with NPs still accounting for less than 0.5% of all RNs.

Table 4. Total number of NPs, years of existence, and their percentage of registered nurses in selected OECD countries, 2015*

Country *(Name/title of NP/APN)*	**Year introduced**	**Total number of NPs (as of 2015*)**	**Activity status of NPs**	**NP % of all RNs**
United States *(NP)*	1965	174,943	Professionally Active	5.6%
Canada *(NP)*	1967	4,090	Practising/ employed	1.4%
United Kingdom (England, N. Ireland, Scotland, Wales) *(Advanced NP, NP)*	1983	n/a	n/a	-
Netherlands *(Nurse specialist)*	1997	2,749	Registered	1.5%
Australia *(NP)*	2000	1,214	Registered	0.5%
New Zealand *(NP)*	2001	142	Practising	0.3%
Ireland *(Advanced NP)*	2001	141	Professionally Active	0.2%

Note: *2015: except for Ireland: 2014; NP= Nurse Practitioners, RNs=Registered Nurses. The data based on the number of registered NPs in the Netherlands and Australia, and the number of professionally active NPs in the U.S. and Ireland are over-estimating the number of NPs providing direct patient care.

Source: Authors, based on Maier et al. (2016) and Canadian Institute for Health Information (2016)

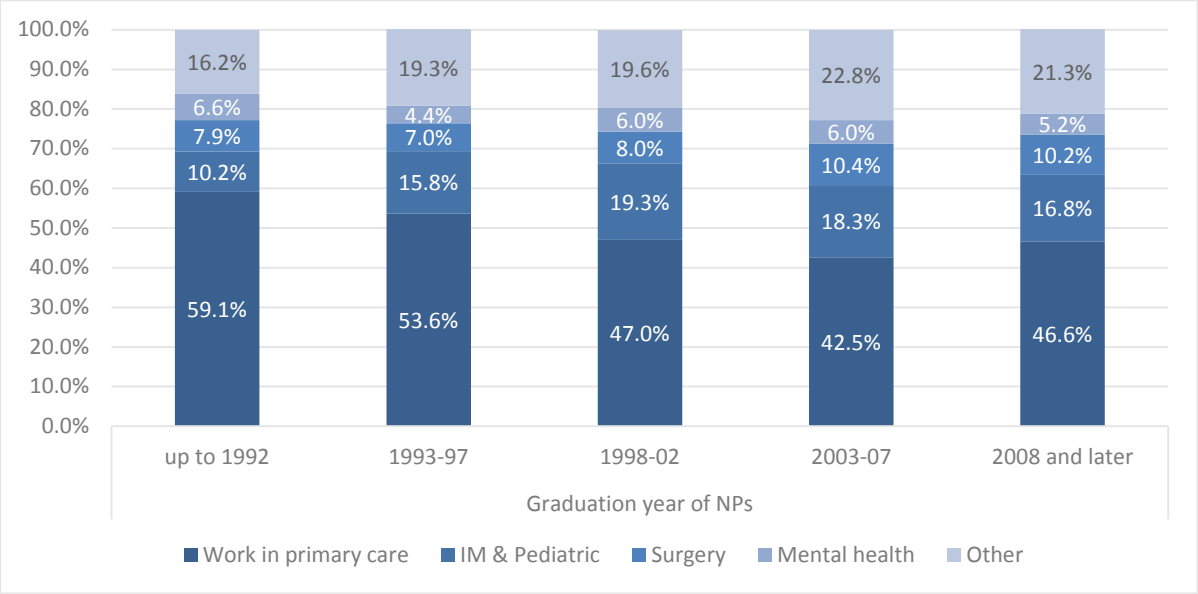
70. Between 2005 and 2015 (or nearest years available), the six countries showed a continuous and substantial growth of the NP workforce, consistently higher than growth rates among the medical professions in the same time period in all countries (Maier et al., 2016). Educational capacity is also increasing: in the United States, the number of graduates from NP programmes increased more than two-fold between 2005 and 2012, from 6,900 to over 14,000 graduates annually (OECD, 2016). Likewise, the number of new NP graduates in Canada increased from 178 in 2005 to 449 in 2014, albeit with some fluctuations (Canadian Institute for Health Information, 2016). In the Netherlands, the admission to Nurse Specialist training programmes increased from 217 in 2005 to 353 in 2012 (OECD, 2016).

Data availability and accuracy on Nurse Practitioners working in primary care is limited

71. The previous section has compared the size of all NPs irrespective of their employment settings, hence including all care sectors. Data on NPs in *primary care* exist in very few countries. Moreover, often the available data face limitations in accurately measuring primary care, since definitions of primary care settings and providers vary within and across countries. A study in the U.S. found that data on the percentage of NPs in primary care varies widely depending on whether the data reflect NP specialisation, certification or actual employment. While approximately 75% of all NPs in the U.S. are *certified* in primary care, 68% of NPs are *employed* in primary care settings, and only half of NPs are *specialised* in primary care or a related specialisation (Spetz et al., 2015). According to a 2012 national survey, about half (48%) of all NPs who provided direct patient care (60,407 of 127,000) were *working* in primary care facilities, with the other half mainly working in hospitals (U.S. HRSA National Center for Health Workforce Analysis, 2014).

72. Information is scarce on the extent to which primary care is gaining or losing interest as work place among NPs. In the United States, almost 60% of NPs who graduated in 1992 or earlier years were working in primary care. This proportion dropped to 42.5% among NPs who graduated between 2003 and 2007. However, as of 2008 the trend reversed, with 46.6% working in primary care settings (Figure 3).

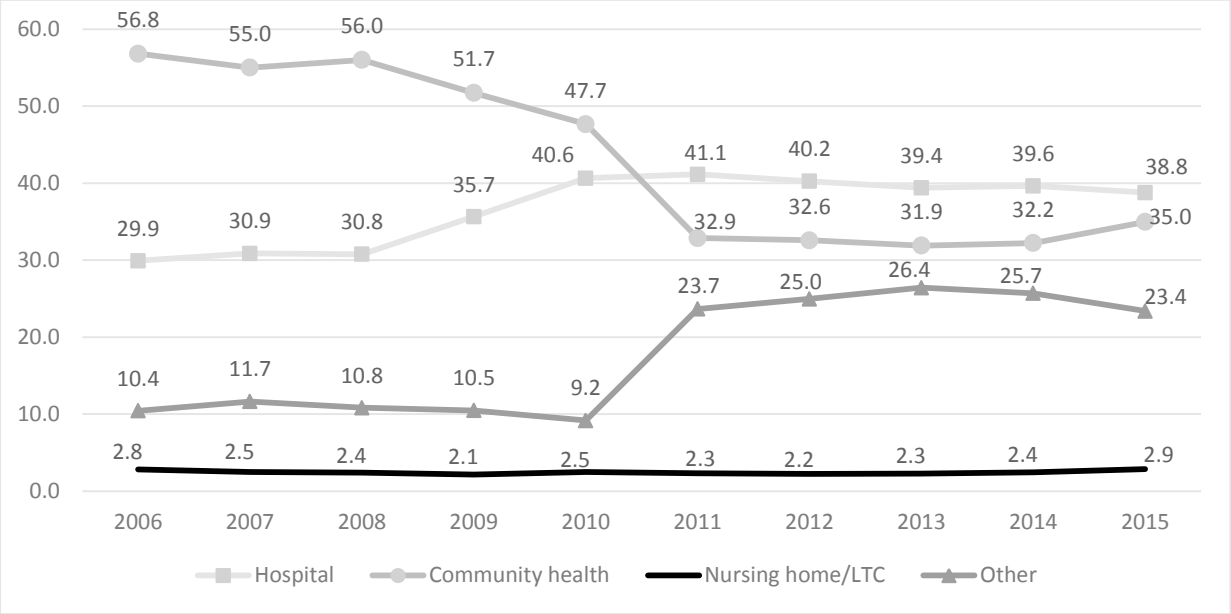
Figure 3. United States: Percent of NPs working in primary care by year of graduation, 2012



Note: NPs=Nurse Practitioner, IM=Internal Medicine, *Source*: U.S. HRSA National Center for Health Workforce Analysis (2014)

73. In Canada, data also indicate changes in the share of NPs in different work settings over time. Up to 2010, the percent of NPs who worked in community health settings (used as a proxy for primary care) was consistently higher than in hospital or other settings (Figure 4). As of 2011, the percentage dropped to approximately 32-33% and increased again slightly to 35% in 2015. The sharp reduction in the percentage of NPs working in community care in 2011 is related to the large increase of NPs working in "other health care settings", including self-employed, business/industry, private nursing agencies and other places. NPs working in hospital settings increased to around 41% in 2011 and declined slightly to 38.8% in 2015. The share of NPs working in nursing homes and other long-term care settings remained low and relatively stable, between 2% and 3%.

Figure 4. Percent of NPs working in community health, hospital and other health care settings, Canada, 2006-2015



Notes: LTC=Long-term care, Other = Other places of work, including self-employed, business/industry/occupational health office, private nursing agency/private duty, educational institution, association/government and other place of work.

Source: Canadian Institute for Health Information (2016).

74. In the Netherlands, no information was identified on Nurse Specialists *working* in primary care, but data is available on their specialisations. Of the five regulated specialisations of Nurse Specialists, the most common is intensive care (N=1,312, as of 2016), followed by mental health (N= 808), chronic care (N=477), acute care (148) and preventive care (41) (Dutch Nurse Specialists Registry, 2016). While specialty areas do not equal actual employment in the workplace, there have been estimates suggesting that approximately 10% of Nurse Specialists in the Netherlands are educated to care for patients with common diseases, such as skin, musculoskeletal or respiratory diseases, hence providing a potential - yet imperfect - proxy for the share working in primary care settings (Laurant, 2013). In the other OECD countries covered, it was not possible to identify information on the percentage of NPs working in primary care.

75. In sum, there are large differences across countries in the number and share of the NP workforce and their work settings. The growth rate, however, has been generally high in all six countries where data are available (Maier et al., 2016). The NP workforce can be expected to continue to grow in the coming years given the increasing number of students admitted or graduating from NP education programmes (OECD, 2016).

76. The following conclusions can be drawn. First, in countries that regulate the titles of NPs and other advanced nursing roles and require mandatory registration/endorsement, data is more likely to be available and of greater completeness and quality than if the titles are not regulated or if the registration is voluntary. Second, as the number of NPs and other APNs is growing in many OECD countries, it will become increasingly important to monitor both growth rates in overall numbers and the distribution in different workplaces. Information on NPs working in *primary care* is essential, but routine statistics are scarce and face major limitations. Registration policies linked to periodic re-registration practices including information on workplace, would improve data availability on the three elements considerably: data availability, practicing status, and workplace (primary care vs. other settings). Improving the quality of data is one critical strategy to allow for better monitoring and workforce planning.

4. POLICY AND ORGANISATIONAL BARRIERS AND ENABLERS

77. Many OECD countries have undertaken reforms or are currently implementing reforms to advance the roles of nurses. Examples include expanding the scope-of-practice of NPs and/or APNs or reforms authorising nurse prescribing of pharmaceuticals for a larger group of nurses (see Section 2.4). Many of these reforms have been lengthy and controversial. Policy reform processes in some countries, including Spain, New Zealand and the majority of U.S. States for instance, have taken many years if not decades to be adopted and implemented and some are still ongoing (see box 6) (Romero-Collado et al., 2014, Phillips, 2016).

Box 6. Reform processes: experiences in the United States, New Zealand, and Spain

In the United States, due to state-specific authority over scope-of-practice laws, changes to scope-of-practice laws have been ongoing for decades (Phillips, 2016). Changes to laws have often been opposed by medical associations and delayed or stalled reforms. After decades of policy debates and research on the effectiveness and quality of NP-provided care, NPs are now widely accepted and valued in the U.S., yet regulatory and payment barriers to practice still persist in the majority of U.S. states but are changing slowly.

In New Zealand, it took a decade from a first ambitious proposal to expand the role of nurses and other health care providers to the third reading of a Health Practitioners Bill in parliament in November 2016 due to a variety of factors, one being the opposition by the medical association. This Bill, if adopted, will involve a radical change from a focus on medical practitioner to health practitioners and in the process amend seven statutes simultaneously. For example, the legislative changes would grant NPs independence in signing sickness leave certificates, declaring people (un)fit to drive, and signing death certificates, among others (New Zealand Government, 2015; New Zealand Nursing Review, 2015).

In Spain, legislation on nurse prescribing was enacted in 2009, yet, until 2015, it could not be implemented in practice due to the lack of an agreement on the formulary of pharmaceuticals, which were to be agreed between the professional colleges of medicine and nursing and the Ministry of Health (Romero-Collado et al., 2014). In 2015, a law was finally adopted, granting restrictive prescribing authority to nurses.

78. For countries considering introducing new roles for nurses, one of the key questions is how to design policies and reforms that can be implemented in a timely manner, while avoiding – to the extent possible – political barriers and resistance, ensuring patient safety and quality of care, and benefiting the patient and the public at large. This section focusses first on the role of governance and regulation as enabler vs. barrier to NP/APN uptake in health care practice. It then assesses the role of financing and payment mechanisms in the implementation of new nursing roles. The final section discusses the important role of organisational factors and management at the health care settings level.

4.1. The role of regulation in ensuring safe practice and uptake of advanced roles

79. This section shows the differences across countries in how they govern advanced nursing roles. It primarily looks at the use of regulation versus non-regulatory governance mechanisms focusing on NP and other APN roles.

80. Box 7 provides an overview of the definitions of governance and regulation related to health professions.

Box 7. Governance and regulation of health professions: definitions and concepts

Governance refers to various mechanisms through which policies are designed, implemented, monitored and evaluated. Governance includes legislation and other legally binding regulatory measures, as well as non-regulatory governance tools that are more flexible to adaptations, such employer/employee protocols, collaborative arrangements in the workplace, or guidelines (Hastings et al., 2014; Maier, 2015).

- Regulatory approaches: With regard to health professions, regulation limits the entry to a profession via laws, bylaws or other legally binding policies to protect a title and/or scope-of-practice of a profession (Bauchner et al., 2015). Measures include defining and regulating scope-of-practice, licensing procedures, mandatory registration or credentialing, among others. Regulatory authority can be at national or sub-national levels.
- Non-regulatory approaches: Governments can also decide not to regulate advanced nursing roles and leave flexibility for the practical implementation of extended roles and responsibilities to individual health care organisations and teams. This can include, for example, individual employers and/or physicians determining the (individual) scope-of-practice based on clinical guidelines, protocols, collaborative arrangements or practice agreements, among other measures (Maier, 2015).

81. Countries vary considerably in whether and how they have regulated NPs or other APNs (table 5). Virtually all countries covered in this report where NPs exist – except the UK – have regulated the role via legislation and thereby protecting scopes-of-practice and the respective titles. The main reason for regulation of the NP/APN roles is that they have been educated to practice at a higher level compared to registered nurses. Regulation is usually linked to mandatory registration, licensing or endorsement requirements with the countries' respective regulatory bodies.

82. In the four parts of the UK, NPs are not regulated, nor are they required to register as NP with the UK Nursing and Midwifery Council. This followed a decision in 2009 not to regulate advanced nursing practice through statutory regulation (UK Council for Healthcare Regulatory Excellence, 2009, NHS Scotland, 2015). At the same time, the Council for Healthcare Regulatory Excellence suggested employers and health care settings to make use of local governance mechanisms to ensuring patient safety and quality of care provided by NPs (UK Council for Healthcare Regulatory Excellence, 2009). This decision was based on the principle of *proportionality of risks*, hence an ex-ante evaluation which found that additional regulation would not be necessary on the grounds of the (limited) potential threat to public safety.

Table 5. Regulation of NPs and other APNs in selected OECD countries

	Nurse Practitioners (NPs)		Other APNs (e.g. Clinical Nurse Specialists, others)		Non-NP/APN specific
	Regulated profession	**Mandatory registration[1]**	**Regulated profession**	**Mandatory registration[1]**	**Prescribing authority regulated**
Australia	✓	✓	no*	no*	✓
Canada	✓	✓	no'	no'	✓
Ireland	✓	✓	no	no	✓
Netherlands	✓	✓	-	-	✓
New Zealand	✓	✓	no	no	✓
United Kingdom	no	no	-	-	✓
United States	✓	✓	✓*	✓*	✓

Notes: ✓= yes, no=role exists but is not regulated, "- "=role does not exist, * exceptions exist, depending on states/provinces/territories or by jurisdiction,'= not mandatory, but voluntary certification exists in Canada for RNs in 20 specialty areas, [1]Includes mandatory registration, licensing, or endorsement

Sources: based on Maier (2015), Heale and Rieck Buckley (2015).

83. While the majority of countries with NPs have regulated their role and scope-of-practice, few have regulated other APN titles or scope-of-practice (table 5). One of the reasons for the differences may be the comparatively higher levels of advanced practice and/or higher levels of independence of NPs compared to other APNs in some countries, yet the reasons for these differences have not been fully explored. Country practices differ largely from the recommendations by the International Council of Nursing (ICN), which state NP and other APN roles should be regulated due to their advanced level of practice (International Council of Nurses, 2002). Indeed, the lack of title protection and regulation has been identified as impeding the uptake of advanced nursing roles in practice (Maier, 2015). At a minimum, all countries have usually regulated at least one advanced nursing function, that is, nurse prescribing via laws or other legally binding instruments.

84. What is the right balance between regulatory vs. non-regulatory approaches to enabling the implementation of advanced nursing roles in practice? The following section will discuss the role of regulation via legislation (laws, bylaws) and non-regulatory governance approaches and implications on the uptake of advanced nursing roles, role clarity, patient safety and malpractice handling.

Regulation and NP/APN implementation

85. The design, level of detail, locus of regulation (national, subnational), and flexibility of regulatory mechanisms are critical for the effective implementation of new advanced roles for nurses (Maier, 2015). If legislated scopes-of-practice are too restrictive and outdated, they can hinder the uptake of new roles, particularly in early stages of nurse role advancement. Examples include Belgium, Czech Republic, France, Iceland and other countries with restrictive laws that have posed barriers to the introduction of nurses working in advanced practice or resulted in *informal* practice (Maier and Aiken, 2016a).

86. The locus of regulation can also have a considerable impact. Decentralised regulation can lead to different levels of official scope-of-practice and thereby impact on levels of advanced practice authorised to NPs across states, regions or provinces (Phillips, 2015). In the United States, those States with no restrictions in scope-of-practice laws resulted in a higher number and growth of NPs, and expanded service access to patients, particularly in rural areas and for vulnerable populations compared to other States with restrictive scope-of-practice laws (Xue et al., 2015). The Advanced Practice Registered Nurse (APRN) Consensus Model was designed to guide States in the adoption of new laws to harmonise the regulation of APRN roles (National Council of State Boards of Nursing (NCSBN), 2016). While many States have adopted parts or some elements of the Model, there continue however to be variations across States.

87. In Australia and Canada, regulatory authorities over scope-of-practice are influenced by laws at both national and sub-national levels, resulting in a complex construct in defining scopes of practice (Maier, 2015, Scanlon et al., 2016). Sub-national regulation has resulted in barriers for the professions to move across states, provinces or territories. To overcome barriers to mobility and avoid lengthy and duplicative re-registration or endorsement procedures, Australia made a radical change in jurisdictional authority and moved the regulatory power of registration policies for its health professions from the state to the federal level in 2010 (Harvey et al., 2011).

88. On the one hand, overly restrictive regulatory mechanisms can pose significant barriers to advanced nursing practice. On the other hand, regulation – if up to date with new competencies and skills –

is an important enabler to expanded practice.It legalises advanced practice levels, a pre-requisite for the uptake of new roles and advanced clinical activities. Examples of policy instruments include the introduction of a so-called experimental clause in a 2011 law in the Netherlands to grant expanded practice to Nurse Specialists for a maximum of five years, conditioned on the nationwide evaluation of the new roles (Dutch Government, 2011, De Bruijn-Geraets et al., 2014, Maier, 2015). The change in scope-of-practice was recommended after a regular review of the law. This law is unique to date as it allowed for the full, nationwide implementation of task-shifting in practice along with a large-scale evaluation. In the U.S. State of California, a similar mechanism exists, allowing piloting of new professional roles, for a maximum of one year. After the piloting period, a decision is made if the role will be introduced into routine care (State of California, 2015).

Regulation and implications on role clarity

89. Countries in which NPs' titles and scope-of-practice are regulated generally achieve greater role clarity compared to those countries where these are not regulated. In countries with no regulation, titles vary considerably across health care settings, often leading to confusion or lack of knowledge on scopes-of-practice. In Canada for instance, where Clinical Nurse Specialist (CNS) is not a regulated profession, a survey among CNS found a lack of role clarity and lack of relevant positions among the key reasons for some CNS not to work in their role (Kilpatrick et al., 2014a).

Regulation and implications on patient safety and malpractice handling

90. Regulation of health professions aims first and foremost to safeguard the health of the public, ensure minimum quality and to react to malpractice cases. Regulation helps to define official levels of advanced practice, can better sanction individuals if necessary, and may prevent future malpractice of these individuals. If advanced nursing roles are not regulated, the handling of malpractice cases may become more complex and less defined, with the supervising physician or health care setting often being held responsible. There is limited research on the occurrence and handling of malpractice or liability cases among NPs, or among NPs as part of health care teams.

91. In conclusion, regulation appears to support the uptake of new, advanced roles if it reflects the changing competencies and skills in a flexible and timely manner. It may benefit the implementation and practice uptake of new roles, enhance role clarity, set standards on scopes-of-practice and patient safety, and rules for handling of malpractice case. However, an in-depth analysis of regulatory mechanisms and underlying laws, the level of detail in defining scopes-of-practice and flexibility for changes would be required to clearly define regulatory barriers and enablers to the changing roles of nurses and other professions.

4.2. The role of financing and reimbursement policies in providing incentives for the uptake of new, advanced roles

92. Financing mechanisms and reimbursement policies can play a substantial role in the uptake of new nursing roles. This section reviews payment and provider models with a specific focus on two questions: first, can NP/APN be reimbursed by public (or private) health insurance for the services they provide and if so for which services? Second, at what levels are NP/APN reimbursed compared to physicians? It then addresses the impacts of financing and reimbursement policies on billing practices, NP/APN employment in primary care, and potential cost savings for health systems. Finally, the section discusses the use of financial instruments to create greater demand for new nursing roles drawing on selected country experiences.

93. Different financing and provider models can either enable or create barriers for the deployment of NPs and other APNs in primary care. Countries relying primarily on solo GP offices in primary care, which are predominantly paid via fee-for-service payments, are less likely to employ nurses in advanced roles compared to countries with group practices, health centers and mixed payment models (Delamaire and Lafortune, 2010). Payment models that include some element of bundled or global payments on episodes of care, may increase the likelihood of team work and coordination across professions, thereby promoting the use of providers with new roles and responsibilities.

94. In Australia and the United States, reimbursement policies have had impacts on the full use of NPs, particularly the extent to which they were able to work independently (Chapman et al., 2010). In Australia , fee-for-service reimbursement for independently billing NPs is commonly lower than for physicians, whereas the reimbursement levels vary considerably in the United States (table 6) (Chapman et al., 2010, Australian Government Department of Health, 2016, Scanlon et al., 2016). In the United States, NPs working in group practices and in collaboration with physicians can bill under a physician's name if certain criteria are met[7], which is then reimbursed at the 100% physician rate. This option is not possible for NPs working independently in their own practice.

95. In Canada, the most common payment mechanism for NPs and other APNs in all provinces and territories is salary. NPs are primarily employed by health authorities or health care organisations, including family practices, community health centres, hospitals or nursing homes. The salary model depends on securing new money or reallocating money from existing health budgets to employ more NPs and other APNs. This has limited the number of new NP positions in Canada. NPs do not have their own billing number and physicians paid fee-for-services are not permitted to use their own billing number to bill for services provided by an NP. Moreover, the envelope for physician funding is separate from other health services. This division has created some inflexibility in the ability of health planners to redistribute money. It has also created a disincentive to hire NPs because physician income does not come from the global health or hospital budget. There are large variations in salaries for NPs across and within provinces (Martin-Misener et al., 2015a). For example, in Ontario, hospital-based NP salaries are higher than those in the community.

96. In Australia, 72% of NPs are employed in the public sector and are salaried (Helms et al., 2017). In 2010, NPs received access to the Medical and Pharmaceutical Benefits Schemes (MPBS) which removed major barriers to practice, as NPs had previously not been able to be remunerated for their services from Australia's Medicare, nor had they been allowed to prescribe medications at the subsided rate in (public) outpatient setting or private practice (Scanlon et al., 2016). Their reimbursement is less than half of a GP's fee. In outpatient settings, there are still barriers to practice. For NPs in outpatient settings to order diagnostic tests or make referrals, a Medicare Benefits Schedule (MBS) provider number is required so that the diagnostic provider can be reimbursed by the government (Australian Government Department of Health, 2014).

[7] The physician must perform the initial assessment and needs to be actively involved in the course of the patient's treatment. The physician does not have to be physically present in the treatment room, but must be available to provide "direct supervision" (e.g. present in the office to offer assistance if necessary), and document that requirements were met.

Table 6. Reimbursement fees for Nurse Practitioners compared to GPs/Primary care physicians

Country	Reimbursement for specific services by insurer	NP fee	GP/PCP fee
Australia (2016)	Medicare: scheduled fee for consultations according to four categories:	NP (85% of scheduled NP fee):	GP fee (100% of scheduled GP fee[1]):
	Brief consultation, short patient history, limited examination	AUS $8.20 x 0.85 = 6.97	AUS $16.95
	Standard consultation lasting less than 20 minutes	AUS $17.85 x 0.85 = 15.17	AUS $37.05
	Consultation lasting at least 20 minutes duration	AUS $33.80 x 0.85 = 28.73	AUS $71.70
	Consultation lasting at least 40 minutes	AUS $49.80 x 0.85 = 42.33	AUS $105.55
United States (2016 or nearest*)	Medicare	85% of physician fee or 100% for "incident-to-billing" under physician name	100%
	Medicaid (U.S. State-specific)	75-100% of physician fee depending on State	100%
		Community Health Centers: Payment per visit (same rate for NPs or GPs)	100%
	Private health insurers	Range from not recognised to 100%	100%

Notes: [1]= GPs who meet qualifications as so-called "vocationally registered" GPs, NP=Nurse Practitioner, GP=General Practitioner, PCP= Primary Care Physician, * information on Medicare: 2016, Medicaid: 2015, private health insurers: based on a 2012 survey.

Sources: Chapman et al. (2010), Hansen-Turton et al. (2013), Poghosyan and Aiken (2015), Australian Government Department of Health (2016)

97. In the United States, reimbursement rates for independent NPs vary considerably by health insurer and provider setting. Under Medicare (the insurer for the U.S. population aged 65 years and over and younger people with disabilities), the rate is 85% of a physicians' fee for NPs billing independently. NPs can bill under a physician's name, referred to as "incident-to-billing" which is reimbursed 100%, if requirements on supervision and collaboration are met. Community health centers are paid per visit, irrespective of whether a NP or physician provides the service. Among Medicaid (which covers primarily low-income adults and children and is administered by the individual U.S. states), reimbursement varies by State, ranging from 75 to 100% of the rate that is paid to a physician for the same services provided (Chapman et al., 2010). Moreover, NPs are not always recognised as primary care providers across the United States (Hansen-Turton et al., 2013). Approximately 25% of the major U.S. health maintenance organisations do not recognise NPs as primary care providers, thereby limiting patients' access to NPs.

98. What are the effects of lower versus equal reimbursement rates for NPs compared to physicians? In the United States, a study of Medicare beneficiaries found that reimbursement claims of Medicare

patients treated by NPs compared to physicians were 29% lower than for patients treated by primary care physicians, after adjusting for potential confounders (Perloff et al., 2015). The main reason was the fact that NPs were reimbursed 85% of the primary care physician rate. This lower reimbursement rate, however, only explained about half of the cost differentials (see also section 5.3).

99. There is some evidence that lower NP reimbursement rates compared to physicians may lead to lower costs when comparing individual providers' salaries or reimbursement rates, but other factors also play a role, depending on the time physicians spend on supervision, productivity and whether NP/APN substitute or supplement for services provided by physicians. Moreover, unintended consequences may also occur. In the United States, lower reimbursement rates may lead to billing practices under physicians' names (incident-to-billing), thus reducing potential cost savings. This may also prevent NPs to work to their full scope-of-practice. In a survey of 592 NPs in two U.S. states, 61% of NPs working in community health centers responded they were responsible for their own panel of patients, yet this share was only 32% of NPs working in clinics associated with hospitals (Poghosyan and Aiken, 2015). One potential reason for this difference relates to reimbursement policies, since community health centers are paid the same rate per visit irrespective of the provider and encourage NPs to work to full practice.

100. Regulation of scope-or-practice, but also reimbursement policies have shown to impact on NPs' work place in the United States. NPs had a 13% higher odds to work in primary care in U.S. states with no regulatory restrictions on scope-of-practice; this increased to 20% in states that reimbursed NPs and physicians equal fee for the same services provided (Barnes et al., 2017). In addition, access to primary care improved for Medicaid patients. This suggests payment policies should be evaluated for unintended consequences in different country contexts. If the primary policy objective is to expand workforce capacity in primary care or rural areas, higher reimbursement rates may be a policy option to stimulate NP/APNs to work in areas of highest need.

Financial instruments: the role of financial (dis-)incentives

101. In addition to payment policies and reimbursement rates, other financing instruments can impact on the primary care workforce, as demonstrated in two Baltic states, Estonia and Lithuania. In these two countries, financial incentives, coupled with financial dis-incentives, have had large and positive effects on creating demand for expanded roles of nurses. Both countries introduced similar financial instruments. The 2009 reform in Estonia required family physicians to employ at least one family nurse and has resulted in a very quick deployment of family nurses in primary care practices. The number of family practices employing a second family nurse, which was financially incentivised in 2013, has had less uptake to date (Box 8). Using financial (dis-)incentives to create demand and overcome initial barriers to the uptake of new professional roles is a promising approach that warrants further evaluations in different contexts.

Box 8. Country snapshot: Estonia's use of financial instruments to accelerate the integration of family nurses in primary care practices

Estonia has introduced financial instruments to fully and rapidly integrate family nurses with expanded roles in primary care. In 2009, Estonia introduced a financial instrument for family doctors to employ at least one family nurse in their practice. In case of non-compliance, a penalty applies and capitation-based rates are cut by 20% (0.8 capitation rate). As a result, nearly all general practices (99%) in Estonia employed at least one family health nurse, based on 2011 data (Lai et al., 2013). In order to further boost the demand and employment of family nurses working in an expanded practice profile, since 2013, family doctors also receive a bonus if they employ two family nurses. As of 2014, 27% of family physicians employed a second family nurse offering a minimum number of independent practice hours, thereby expanding access to primary care and improving collaboration within practices (Estonian Health Insurance Fund, 2014).

102. In conclusion, there is increasing evidence on the impacts of financing and in particular, reimbursement policies on the deployment of NPs and other advanced nursing roles, costs and patient access. However, the studies have been primarily conducted in the United States and less so in other OECD countries. Three lessons emerge: first, as can be expected, payers that do not recognise NPs and therefore do not reimburse their services pose significant barriers to the uptake of new, expanded roles. Second, lower NP reimbursement rates or salaries compared to physicians may lead to cost savings, but in the United States other mechanisms, such as "incident-to-billing", hence billing under a physician's name, may reduce potential cost savings. Third, targeted financial incentives or dis-incentives (in case of non-compliance) may accelerate the uptake of extended nursing roles into routine care, as demonstrated by innovative finance schemes in Estonia and Lithuania.

4.3. The role of health care organisations and leadership support is critical for the uptake of advanced roles in practice

103. Individual health care organisations, their leadership, management and work environments also play a critical role in the uptake of advanced nursing roles within teams. Supportive management and organisational changes are required to allow for the successful integration of new professional roles into daily practice.

104. There are large variations in the uptake of any workforce innovation among different health care organisations. This also applies to new professional roles, particularly if the degree of innovation is high and the required changes are complex. Three elements influence the uptake of new professional roles: 1) their perceived necessity and added value, 2) the level of influence of the individuals who adopt the change, and 3) other context and management factors within the organisation (Berwick, 2003). Senior-level leadership and support for the introduction of new roles is critical. Other elements include the re-structuring of work flows and effective communication with all professions involved. In the United States, different types of management styles and organisational settings have shown to be relevant for the successful integration of NPs in different work setting. These include the clarity of the new role, internal communications, the NP relationship with physicians and managers, and access to resources (Poghosyan and Aiken, 2015, Poghosyan et al., 2015).

105. Location of practice can largely influence the extent of advanced practice, driven by provider shortages, particularly in rural and remote areas. In Canada's province British Columbia, NPs working in rural practice were shown to work to their full extent of education (Roots and MacDonald, 2014). In the United States, NPs were more likely than physicians to work in rural and remote areas and provide care to vulnerable, disadvantaged patients (DesRoches et al., 2013)

106. Organisational support has shown to be an important factor to contribute to the successful integration of NPs and other APNs in the workplace. NPs receiving a formal orientation at their workplace were more likely to show an effective role transition during entry into practice (Barnes, 2015). Mentoring or orientation programmes and a nurturing work environment have shown promising results (MacLellan et al., 2015). Barriers to a successful role transition include a lack of understanding of the new role among employers and colleagues, little or no formal support within the organisation and limited informal support (e.g. by colleagues, supervisors) to help NPs integrate in clinical settings (Sullivan-Bentz et al., 2010). Leadership in this context is crucial, including establishing structured programmes to ease transitional periods that not only support the new professional roles, but also the health care team to adopt to the changes.

107. Some of the principles to foster collaborative and multi-disciplinary team work include defining responsibilities for each member of the team and a culture that facilitates communication about and with the patients, along with strong leadership (Tubbesing and Chen, 2015).

5. EVALUATION: EFFECTIVENESS, COSTS AND EFFICIENCY

108. This section provides a synthesis of existing evaluations, with a focus on the results from systematic reviews on the effectiveness, costs and efficiency of nurses working in advanced roles in primary care. It also includes evidence from recent major empirical studies not included in these systematic reviews to enrich the discussion on the economic impact of nurses working in advanced practice in primary care. Findings are highlighted in the country and organisational contexts, for population groups or patient conditions, and educational qualifications.

5.1. The number of systematic reviews evaluating advanced nursing roles in primary care has increased considerably

109. Ten systematic reviews were published on the effects of nurses taking up tasks and roles usually performed by physicians on a range of outcome measures or costs (see table 7). All reviews were primarily or entirely based on randomised controlled trials (RCTs), the "gold standard" in the evaluation of interventions. Most reviews focussed on primary care and evaluated various nurse-physician substitution or delegation models, including different roles and educational levels of nurses, such as NPs, clinical nurse specialists, and registered/licensed nurses in advanced roles. The major inclusion criterion was that nurses performed – largely or fully – the same services as physicians. One review covered various new professional roles in all health care settings, but due to the focus of this paper, we present only those findings related to nurses in advanced roles and primary care (Tsiachristas et al., 2015).

110. The reviews consistently found that nurses who provided various advanced clinical services was at least of equal – or higher – quality compared to physicians. Most of these evaluations were conducted in the Netherlands, United Kingdom and the United States, and few were carried out in other countries, such as Australia, Canada, Sweden, Switzerland, as well as Russia and South Africa. Health care settings varied, including nurses working in physician group practices, health centres, nurse-led clinics, GP/physician solo or small group practices and outpatient settings.

Table 7. Summary of systematic reviews on the effects of nurses in advanced roles in primary care (2014-2016)

Systematic review	***Aim(s) of review***	***Overview of studies included***	***Care settings / diseases / Nurse education***	***Main findings***
1 Martinez-Gonzalez et al. (2014a)	Assess evidence on the clinical effectiveness and costs of physician-nurse substitution in primary care	• 24 RCTs (n=38,974 patients) • *Outcomes:* Mortality, quality of life, patient satisfaction, hospital admission, costs • *Countries:* UK, NL, US, South Africa, Russia	• Primary care settings, e.g. general practices, nurse clinics, health centers; for patients with undifferentiated or heart diseases, diabetes, others • *Nurses' education*: NPs, RNs/LNs (extended roles)	• **Higher patient satisfaction** with nurse-led compared to physician-led care (higher overall patient satisfaction scores, based on pooled analyses, standardised mean difference: 0.18, 95% CI: 0.13-0.23) • **Reduction in hospital admission** (lower relative risk (RR): 0.76, 95% CI: 0.64-0.91) • **Reduction in mortality** (lower RR: 0.89, 95% CI: 0.84-0.96) • **Inconclusive results on quality of life and costs**
2 Martinez-Gonzalez et al. (2014b)	Assess impact of physician-nurse substitution on clinical parameters in primary care	• 11 RCTs (n = 30,247 patients) • *Outcomes:* 35 clinical parameters • *Countries:* UK, NL, US, South Africa, Russia	• Various primary care settings for patients with hypertension, heart failure, diabetes, and other diseases • *Nurses' education*: NPs, RNs/LNs (extended roles)	• The **majority of clinical parameters showed no significant differences** between nurses and physicians (approximately 80% of all clinical parameters) • **For the remaining 20% of parameters,** nurse-compared to physician-led care showed better outcomes, e.g. systolic blood pressure (RCTs conducted in NL, UK, U.S.), cardiac function (RCT in Russia) or HIV/AIDS antiretroviral treatments (RCT in South Africa)
3 Kilpatrick et al. (2014b)	Evaluate cost-effectiveness of Clinical Nurse Specialists (CNS) in two models of care: a) alternative/ substitution roles; b) complementary roles	• 11 RCTs (4 RCTs with alternative model, n=683 patients; 7 RCTs with complementary model, n=1,464) • *Outcomes:* Health service use, costs, quality of care, health status • *Countries:* UK, NL, US, China	• Outpatient care, e.g. outpatient care clinic, for patients with heart diseases, asthma, diabetes, cancer, arthritis • *Nurses' education*: Clinical Nurse Specialists with graduate degree	• **Similar patient outcomes and "some evidence" of reduced resource use and costs** of CNS care in *alternative/substitution provider models* • **Similar-to-improved patient outcomes and similar resource use** in *complementary provider models* (but based on low quality economic analyses)

4 Martinez-Gonzalez et al. (2015a)	Compare resource use of task-shifting from physicians to nurses in primary care	• 20 studies: 18 RCTs (n=13,171 participants) and 2 economic analyses • *Outcomes:* length of consultation, frequency of return consultations, referrals, prescriptions, cost • *Countries:* UK, NL, US	• Various primary care settings, for patients with undifferentiated illnesses, hypertension, heart diseases, diabetes, others • *Nurses' education*: NPs in 13 RCTs, RNs / LNs (extended roles) in 5 RCTs	• **More return visits** in nurse-led care compared to physicians (41% of patients returned for consultations to nurses compared with 33% to physicians); hence higher odd ratios for return visits (1.22, CI: 1.09-1.37) • **Longer consultations** (Mean difference: 3.25 minutes longer in nurse-led care, CI: 2.24-4.27) • No statistically significant differences in **referrals, pharmaceutical prescriptions, tests and investigations** ordered • Inconclusive results on costs
5 Martinez-Gonzalez et al. (2015b)	Assess effect of physician-nurse substitution on process of care outcomes in chronically-ill patients	• 14 RCTs (n=10,743 patients) • *Outcomes:* 53 process measures of chronically-ill patients • *Countries:* UK, NL, US, Russia	• Various primary care settings, for patients with undifferentiated illnesses or hypertension, heart failure, diabetes, others • *Nurses' education*: 9 RCTs with NPs only, 5 RCTs with RNs and/or NPs	• Most studies showed **no significant differences on process measures** between nurse- and physician- led care, yet around **40% of the RCTs found improved process measures** in nurse- compared to physician-led care • Nurses were **more likely to provide patient information**, including on the causes of diseases or health problems (in 2 out of 3 RCTs) and about symptom relief and management, self-medication
6 Martinez-Gonzalez et al. (2015c)	Assess the evidence on physician-nurse task-shifting in primary care on the course of disease	• 12 RCTs (n= 22,617 patients) • *Outcomes:* 25 disease-specific measures on the course of disease • *Countries:* UK, NL, South Africa, Russia	• Settings: general practices, nurse clinics, health care centres, for patients with undifferentiated or specific conditions • *Nurses' education*: total of 8 RCTs with NPs, 1 RCT with RNs/LNs and 3 RCTs with LNs	• The majority (84%) of disease-specific measures found **no statistically significant difference between nurse- and physician-led care** • Nurse-led care resulted in better **secondary prevention outcomes among patients with diabetes** in lowering heart disease and cardiovascular risk

7 Martin-Misener et al. (2015b)	Evaluate cost-effectiveness of 3 NP models: (i) alternative role (*substitution)* in primary care; (ii) ambulatory specialised care, (iii) complementary role in specialised care	• 11 RCTs (4 on NPs in alternative roles in primary care, 2 RCTs in alternative roles in specialised ambulatory care, 5 RCTs in complementary roles) • *Outcomes:* cost-effectiveness, resource use • *Countries:* US, UK, NL	• Settings: general practices, nurse clinics, for patients with undifferentiated/acute illnesses or specific conditions (e.g. diabetes, hypertension) • *Nurses' education*: all 11 RCTs with NPs	*Alternative role in primary care:* • **Lower health services costs** (meta-analysis of 2 studies conducted in the Netherlands and UK, with n=2,689 patients, lower mean costs per visit of €6.41 on average in NP versus physician model (Confidence Interval (CI): -€9.28 to -€3.55) • **Longer consultations, more return visits**, but similar number of referrals, pharmaceutical prescriptions, tests ordered *Alternative role in ambulatory specialised care:* • Limited evidence on cost-effectiveness *Complementary role in ambulatory specialised care:* • Inconclusive results, due to low quality evidence
8 Tsiachristas et al. (2015)	Assess impact of new professional roles on a wide range of health service outcomes and costs	• 41 studies (31 RCTs and other studies with controls) on NP- or "specialist nurse"-led care compared to GPs/physicians and other "traditional" professions • *Outcomes:* 11 outcome measures • *Countries:* UK, US, NL, Canada, Australia, Sweden, Norway	• Settings: general practice, hospitals, long-term care, for patients with cancer, diabetes, arthritis, heart failure, or minor illnesses • *Nurses' education*: 16 studies with NPs, 25 studies with specialist nurses in intervention groups	*Advanced NPs vs. physicians/other professions:* • **Improved patient satisfaction** (5 out of 8 studies), **patient information** (3 of 4); and **clinical outcomes** (5 of 5); inconclusive results on QoL and resource use • Various results on cost-effectiveness: one study in the UK found lower costs / improved outcomes, another study found same costs / improved outcomes; and a third study from the UK found higher costs / improved outcomes *Nurse specialists vs. physicians/other professions:* • **Improved patient satisfaction** (4 of 6) and **information** (5 of 6); • Inconclusive results on **cost-effectiveness**: four studies found no significant difference in costs/outcomes, two studies found lower costs/improved outcomes, and one study found reduced costs/reduced outcomes

9 Swan et al. (2015)	Assess quality of care and costs provided by Advanced Practice Nurses (APN) in primary care	• 10 studies (7 RCTs, 1 RCT follow-up study with 10,911 patients, plus 2 economic evaluations) • *Outcomes:* physiological measures, patient satisfaction, resource use, costs • *Countries:* UK, US, NL, Canada	• Settings: various primary care settings, for patients with various diseases • *Nurses' education*: APN, yet titles, scope of practice and oversight requirements varied	• **Equal or better outcomes** compared with physicians for physiological outcome measures, and patient satisfaction • **Same or reduced costs** compared to physicians • **Longer average consultations**, but two studies found APN patients required fewer visits over time compared to physicians
10 Morilla-Herrera et al. (2016)	Assess effect of interventions by APNs for older people in different care settings	• 15 RCTs with APNs providing care to patients aged over 65 within teams • *Outcomes:* functionality, mortality, QoL, satisfaction, cognitive status • *Countries:* US, Sweden, NZ, UK, Denmark, China, Switzerland	• All care settings, including long-term care, home care, ambulatory care, transitional care, hospital care, for older people with various conditions • *Nurses' education*: NPs, CNS, RNs specialised in aged-care and gerontology	• In long-term care settings, **APN interventions reduced hospital readmissions**, and **improved patients' and family caregivers' satisfaction** • However, causality is limited as APNs were part of multidisciplinary teams

Notes: RCT=Randomised Controlled Trial, CI=95% Confidence Interval, NPs=Nurse Practitioners, CNS=Clinical Nurse Specialists, APNs=Advanced Practice Nurses, QoL=Quality of Life, NL=Netherlands, NZ= New Zealand, UK=United Kingdom, US=United States

111. Patient satisfaction tended to be higher among nurse- compared to physician-provided care, whereas evidence on clinical parameters showed no differences in most conditions, but positive outcomes in some conditions (Martinez-Gonzalez et al., 2014a, Martinez-Gonzalez et al., 2014b, Morilla-Herrera et al., 2016). Most nurses worked as part of teams with some sort of physician involvement, ranging from no, limited to close oversight. Only few trials reported that nurses performed services fully independently. These findings suggest that team-based care models where all providers work to their level of competency and scope-of-practice, may result in higher quality care.

112. Although the high number of systematic reviews found consistently that the quality of care of nurse-provided interventions was at least equal to physician-led care and resulted in improved patient satisfaction, some studies face limitations. Several trials had a medium or small patient sample size, faced high attrition rates, selection bias or insufficient power to detect effects. Moreover, the service delivery settings, detailed activities and responsibilities of nurses, and their levels of education was not always reported in sufficient detail.

113. Evidence on costs and resource use is inconclusive. While some studies suggested cost savings primarily due to lower salaries of nurses, others found mixed results. Nurses tended to take longer on average for patient consultations and requested more return visits, suggesting lower productivity than physicians. Possible reasons may be less experience, inefficient work flows, supervisory structures or oversight requirements, among others. Nurses also tended to provide more information to patients, which in turn may be associated with higher patient satisfaction. Moreover, hospital (re-)admissions tended to be lower for patients in the nurse- compared to physician groups, which has positive effects on resource use and may save costs.

114. The following sections provide further information on key findings reported in the summary table (table 7).

5.2. Quality of care and clinical effectiveness is at least equivalent when nurses take up advanced roles, while patient satisfaction improves

115. The quality of care of nurse- versus physician-provided services has been evaluated through several outcome measures including clinical effectiveness, mortality, secondary prevention and patient satisfaction.

Clinical effectiveness

116. Nurse-provided care showed equivalent or better quality of care across a large range of clinical outcome measures (Martinez-Gonzalez et al., 2014a, Martinez-Gonzalez et al., 2014b, Martinez-Gonzalez et al., 2015b, Tsiachristas et al., 2015). The trials were primarily conducted among patients with chronic conditions or undifferentiated illnesses in various care settings. In one large systematic review, outcome measures included clinical parameters for a range of conditions, such as heart diseases, diabetes, asthma or COPD and an additional 32 clinical parameters from a range of different diseases (Martinez-Gonzalez et al., 2014b). NP-provided care for patients with hypertension showed a significant decrease in systolic blood pressure, based on five trials conducted in the Netherlands, United Kingdom and the United States. For other clinical parameters in patients with various chronic conditions, no statistically significant differences were found in the NP- compared to physician-led groups (e.g. diastolic blood pressure, total cholesterol and blood glucose).

117. Findings on the equivalence of quality of care have been reported in all other reviews, including in the sub-groups of NPs, other APNs, specialist nurses, and across a wide range of care settings, for a variety of patient groups (Kilpatrick et al., 2014b, Martinez-Gonzalez et al., 2014b, Swan et al., 2015, Tsiachristas et al., 2015). Hence, the findings on equivalence of care are largely consistent and suggest generalisability to a large set of contexts and settings.

Mortality

118. Mortality tended to be lower in patients managed by nurses compared to physicians. In a meta-analysis covering ten trials, a significant reduction in the risk of all-cause mortality was found in nurse- vs. physician-led primary care services (Martinez-Gonzalez et al., 2014a).

119. In sub-group analyses, NPs showed an intensified effect on reducing mortality compared to registered nurses with extended roles, yet, both remained significantly associated with lower mortality (Martinez-Gonzalez et al., 2014a). However, additional sub-group analyses of care models showed a differentiated picture: Lower mortality was found in on-going care and longer-term follow up care (defined as more than 12 months) but not in single visits and shorter follow-up periods (defined as less than 12 months). The reasons for lower mortality in the nurse-led care models have not been sufficiently explored, but hypotheses suggest that this may be related to generally stricter adherence to protocols and guidelines by nurses, more information provided to patients on the disease and self-management, longer time taken for consultations or more return consultations, and increased efforts on secondary prevention, among other factors (Martinez-Gonzalez et al., 2015b, Tsiachristas et al., 2015). Further research is required to analyse the impact of greater nurse involvement on mortality in different care models and their underlying reasons.

Secondary Prevention

120. Secondary prevention by detecting, diagnosing and treating existing diseases as early as possible to slow progress and prevent the onset of additional conditions, is relevant for the growing number of patients with chronic conditions. One systematic review found that nurse-led care was at least as effective as physician-led care in providing secondary prevention to patients with chronic conditions (Martinez-Gonzalez et al., 2015c). Based on an analysis of results from 12 RCTs covering 22,617 patients with various chronic conditions, 84% of outcome parameters showed no statistically significant differences. For the remaining 16%, secondary prevention outcomes improved in the nurse-group, primarily among patients with diabetes. In this patient group, nurse-led care was superior in preventing the onset of heart disease and it lowered cardiovascular risk (Martinez-Gonzalez et al., 2015c).

Patient Satisfaction

121. Patient satisfaction was generally higher with various nurse-led care models compared to physicians (Martinez-Gonzalez et al., 2014a, Tsiachristas et al., 2015). One meta-analysis of seven RCTs with a total sample of 5,821 patients showed a significantly increased average satisfaction among patients receiving services from nurses with various extended roles, compared to physicians (Martinez-Gonzalez et al., 2014a). Findings on higher patient satisfaction rates were confirmed in all reviews studying this outcome measure, including specific groups of NPs-only, nurse specialists, various care settings in primary care, but also across primary, secondary and tertiary care settings and among patients aged 65-years and older (Swan et al., 2015, Tsiachristas et al., 2015, Morilla-Herrera et al., 2016).

122. Nurses tended to provide more information and counselling to patients than physicians (Martin-Misener et al., 2015b, Tsiachristas et al., 2015), including information on the duration of the disease, symptom relief, and options for self-management (Martinez-Gonzalez et al., 2015b). They also handed out material to patients more often than physicians. These findings are in line with other systematic reviews that found nurses were more likely to provide information about the diseases, counselling, lifestyle advice to patients than physicians, hence may explain longer consultation time.

5.3. Evidence on costs and efficiency gains is inconclusive and influenced by several factors including productivity and remuneration differentials

123. Task-shifting and skill-mix changes have been discussed for decades regarding their potential to reduce costs and enhance the efficiency of the workforce. The evidence, however, still remains mixed and inconclusive. Results depend on several factors and the contexts in which advanced roles for nurses are being implemented. One systematic review suggests 'potentially' lower costs of NP-provided care in primary care settings compared with physicians (Martin-Misener et al., 2015b), whereas a second review found 'some evidence' of reduced costs under Clinical Nurse Specialists-provided care (Kilpatrick et al., 2014b). One review suggested that services provided by APNs resulted in equivalent or reduced costs (Swan et al., 2015). The remainder three reviews showed inconclusive results (Martinez-Gonzalez et al., 2014a, Martinez-Gonzalez et al., 2015a, Tsiachristas et al., 2015).

124. Several factors appear to play a role on the costs and efficiency of more advanced roles for nurses. These include the extent of salary differentials between physicians and nurses, the level of reimbursement rates for the same services provided by nurses compared to physicians, productivity, service volume, and the organisation of care and provider settings (Kilpatrick et al., 2014b, Liu et al., 2014, Martin-Misener et al., 2015b, Martinez-Gonzalez et al., 2015a). Studies that showed lower costs of nurse-led care were primarily explained by lower salaries of nurses or lower reimbursement rates of the same services provided (Martinez-Gonzalez et al., 2015a, Perloff et al., 2015). Studies resulting in higher costs or cost-neutral findings found lower overall productivity levels of nurses, and higher service use in nurse- compared to physician-led care (Martinez-Gonzalez et al., 2015a). However, several studies faced methodological limitations.

125. An important factor with implications on both outcomes and costs are avoidable hospital admissions. Hospital admissions tended to be lower in nurse- than physician-led care, which may contribute to cost savings, but data on hospital admissions are rarely covered in economic studies. A meta-analysis of five trials found a significant reduction in the risk of hospital admissions among patients receiving nurse- compared to physician-led care (Martinez-Gonzalez et al., 2014a). However, in sub-group analyses these results remained only significant in the NP-model and not in the RN-led care model.

126. Resource use also varied in several other parameters. Nurse-provided consultations were found to take longer than provided by physicians. Moreover, the number of return consultations was higher as was the average number of visits (Martinez-Gonzalez et al., 2015a, Martinez-Gonzalez et al., 2015b). In one review, nurses spent on average 1.90 to 3.80 minutes longer with patients than physicians, which may be positive for quality or patient satisfaction but negative as a basic measure of productivity (Martinez-Gonzalez et al., 2015c). In a meta-analysis NPs' consultations were on average 4.1 minutes longer per patient (95% CI: 3.7 to 4.5) (Martin-Misener et al., 2015b) and one systematic review of APN services showed 3 to 4.9 minutes longer consultations (Swan et al., 2015). No statistically significant differences were identified in the frequency of ordering prescriptions, tests and investigations. Concerning referrals, results were mixed. In a meta-analysis, nurses in extended roles did not refer significantly more often than physicians, except for primary care with higher referral rates from NPs to GPs and internists (Martinez-Gonzalez et al., 2015a).

127. These findings suggest lower productivity of nurse-led care when measured as the number of patients seen over a certain period of time. Longer consultation may be partly explained by more holistic care provided or by supervisory or regulatory requirements, for example the time NPs need to see a GP to sign prescriptions. Also, longer experience of participating GPs compared to NPs may have played a role, as well as differences in the organisation of work flows, such as appointment bookings (Martin-Misener et al., 2015b). Moreover, other factors may include differences between nurses and physicians in the availability of assistant personnel (Martin-Misener et al., 2015b). Indeed, physicians often employ support staff such as receptionists, which may contribute to improved productivity compared to NPs. One study suggested that NP-led care could result in productivity gains

if NPs had support from medical assistants similar to physicians (Liu et al., 2014). This study found a cost reduction of 9 to 12% per patient treated by NPs supported by medical assistants, based on an analysis of workforce models.

128. In addition to the limited number of economic and costing studies covered by the systematic reviews, two major recent economic analyses add insights on the costs of NP versus physician-led care in the United States (Table 8).

129. A study of U.S. Medicare insurance claims data of Americans 65 years of age and older found that the costs of care provided by NPs was lower compared to physicians. Costs were consistently lower, ranging from 29% lower costs in evaluation and management services in primary care, to 11% in inpatient settings, after adjusting for comorbidities, geographic, demographic variables and other patient characteristics (Perloff et al., 2015). One of the major drivers of lower costs was attributed to the lower reimbursement rates to NPs who bill under their own provider number, which is 85% of the physician rate. However, this accounted for less than half of the cost differentials. Of the total 29% cost differentials in evaluation and management, 11% were explained by these differences in reimbursement rates, whereas the remaining 18% were due to either (i) differences in practice patterns that may lead to cost savings over a period of time (12-months covered in the study) or (ii) uncontrolled factors in service provision or case mix of patients.

Table 8. Overview of two economic analyses of U.S. claims data on the costs of NPs compared to Physicians

	COUNTRY	STUDY DESIGN, INTERVENTION	PARTICIPANTS	DATA ANALYSIS	RESULTS
Perloff et al. (2015)	US, nationwide	Retrospective cohort design, Medicare beneficiaries (over age 65) seen primarily by NPs (who bill under own provider number) compared to beneficiaries seen primarily by primary care physicians	Random sample of NPs and PC physicians: a) Inpatient services (Part A): total of 183,598 beneficiaries, b) office visits (Part B): 522,726 beneficiaries	2009-10 Medicare beneficiaries' claims, inpatient and outpatient services, adjusted for comorbidities, demographics, geography and propensity to see NP	Beneficiaries' claims from NP-provided care were 29% lower (USD 207) than (primarily) primary care physician-provided care. Inpatient and total office visit costs were 11% and 18% lower, after adjusting for demographics, geography, comorbidities. Reasons for lower costs are partly explained by the lower reimbursement rates of NPs at 85% compared to physicians for the same services provided. However, after accounting for reimbursement rates, costs remained lower.
Spetz et al. (2013)	US, 27 states	Retrospective cohort study on episode of care of patients (14-day period) with minor illnesses, e.g. upper respiratory infections, bronchitis, otitis, immunisation and screening, eye infection, allergies, influenza, tonsillitis, viral infection; patients with first visit to retail clinics usually staffed by NPs, compared with patients' index/first visit in other care settings	98,236 episodes of care (14 days)	2004-2007 claims data from health insurers, full costing, control variables: demographics, health status, chronic conditions, proximity to provider, health "shocks" (e.g. injury), constructed health risk measures	Episodes with first visit in retail clinics had significantly lower total payments (including lower payments for inpatient care) than non-retail clinic episodes. Removing restrictions of scope-of-practice were associated with increased cost savings.

Notes: NPs=Nurse Practitioners, PC=Primary Care, US=United States

130. An economic study analysed the costs of episodes of care for patients with minor illnesses going to retail clinics in the United States (Spetz et al., 2013). The study calculated the total costs over a 14-day period between patients going to retail clinics as their first provider setting compared to patients going to other 'traditional' primary care provider settings. Retail clinics are usually staffed with NPs and offer convenient access, usually with no or very short waiting time. The study found that after controlling for various health-related, demographic and other factors, patients first treated at a retail clinic had significantly lower total payments for the subsequent 14-day period than patients going to other primary care providers. In addition, the study showed that patients' episodes of care in those U.S. states with no regulatory restrictions on NPs' practice were less costly than in states with regulatory restrictions in place.

131. Taken together, the systematic reviews and the two U.S. economic analyses show the heterogeneity and complexity of evaluating the costs of nurses in various extended roles compared with physicians. A slightly increasing body of evidence suggests that nurse-led care results in equal or reduced costs, particularly if there are salary differentials or lower reimbursement rates. Yet, very large salary differentials or much lower reimbursement rates may have negative effects on the APN workforce deployment and patient access, as demonstrated in the United States where primary care practices were less likely to employ NPs in states with lower (Medicaid) reimbursement rates for NPs compared to physicians for the same services (Barnes et al., 2017). Evidence suggests that overly restrictive regulatory requirements of physician supervision of NPs can result in higher total costs, for instance the amount of time physicians spend on supervision and other oversight measures, such as co-signature of prescriptions (Martinez-Gonzalez et al., 2015a).

132. Moreover, the organisation of work flows within health care settings impact on the productivity and cost-effectiveness of nurse-provided care. The costs and efficiency of primary care practices employing a NP were found to depend on the workload, the size of the panel of patients and other factors. Models involving capacity pooling among providers, whereby a pool of patients is shared by NPs and physicians and allocated to the next *available* provider, may be a strategy to maximise productivity and access to services as shown in the United States (Liu and D'Aunno, 2012).

6. IMPLICATIONS FOR POLICY REFORMS

133. A large number of OECD countries are implementing reforms to expand the clinical practice for nurses. These reforms are driven by a multitude of push factors, including higher and more diverse patient needs, technological advances, provider shortages or geographical imbalances, among others. Hence, reforms on nurse role advancements aim to improve access to primary care, fill care gaps, reduce costs and/or reallocate clinical tasks and responsibilities within teams. The speed and depth of reforms varies, as does the extent of nurse role advancement.

134. While the effectiveness of nurses taking on advanced roles has been demonstrated, there has been less attention on how to effectively implement reforms. Several lessons can be drawn from the experiences in various countries. The following section provides policy lessons and options for countries (Section 6.1), followed by recommendations for action at the international level (6.2).

6.1. National level: Uptake of advanced nursing roles depends on adoption of enabling governance, regulatory and financing policies

135. Countries at early stages of implementing advanced nursing roles have primarily implemented pilot projects or small-scale programmes. They often faced various challenges in implementing these workforce innovations at a larger scale. Implementation into routine care requires multiple reforms: changes to governance and regulation, finance and payment policies, and major changes to service delivery structures and provider settings.

136. Although reforms are influenced by political will, stakeholders' interests and country-specific political processes, several policy lessons can be drawn that are relevant. Countries with a longer experience in integrating nurses with substantially advanced practice in their health and primary care systems include the United States, Canada, United Kingdom, Netherlands, Finland, Australia, New Zealand and Ireland. Reforms have been lengthy and controversial in virtually all countries and the extent of scale-up has been variable. Nonetheless, these countries have demonstrated the feasibility of implementing reforms across a range of very diverse health systems.

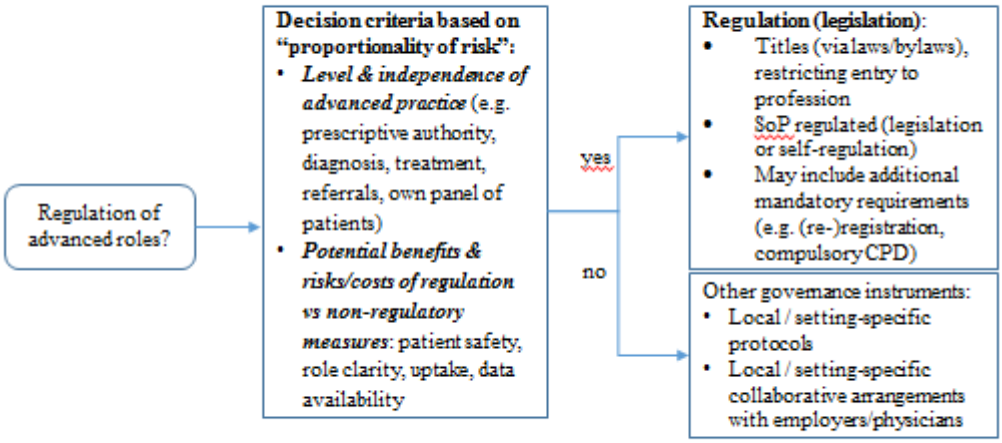
137. Emerging lessons are that governance and regulation are critical policy levers to the implementation of new roles into routine care. Regulation is a pre-requisite for expanded practice: without the authorisation of new, advanced clinical scope-of-practice, nurses cannot practice legally in advanced roles. In addition, the design of finance and reimbursement policies determines if expanded services will be reimbursed and at what level (Maier and Aiken, 2016b). Finally, while policy-makers have tools to directly influence the development of relevant education programmes, regulation and payment policies, the actual uptake at the organisational level can only be partly influenced, for instance through financial incentives (or dis-incentives) as demonstrated in Estonia and Lithuania. At the provider level, however, health care managers play a key role in influencing the successful integration of new, advanced nursing roles within health care organisations and teams.

Governance and regulation

138. Countries vary in whether and how they have regulated advanced nursing roles. Those countries with established NP roles have all regulated the title and scope-of-practice, except for the United Kingdom. The United Kingdom decided not to regulate advanced practice for NPs, based on the principle of "proportionality of risk", but to delegate its governance to health care settings and employers (UK Council for Healthcare Regulatory Excellence, 2009). Yet, countries that have introduced nurse prescribing authority have regulated at minimum this function via legislation.

139. Hence, there are two general pathways to govern scopes-of-practice for nurses in advanced roles (which are not mutually exclusive): first, to regulate the new roles via legislation or other binding regulatory mechanisms such as self-regulation; and second, not to regulate these new roles, but instead to rely on other non-regulatory measures (Figure 6). The decision on whether any additional regulation – beyond the regulation of the RN role – is necessary depends on the extent of advanced practice. Figure 6 shows in a schematic way the governance options, while recognising that governance and regulatory decisions are highly country- and context-specific. Based on the level and type of advanced practice and independence in executing the role, regulatory and non-regulatory governance options can be assessed towards their potential risks and benefits to patient safety, malpractice handling, but also the uptake of the new role in practice and role clarity (e.g. title protection).

Figure 6. Regulation and non-regulatory governance mechanisms of advanced nursing roles



Note: SoP=Scope-of-Practice, CPD=Continuous Professional Development, *Source*: authors, developed based on UK Council for Healthcare Regulatory Excellence (2009), Maier (2015)

140. According to the ICN, all NP and other APN roles should be regulated, given their high levels of advanced practice. In addition to the regulation of titles and scopes-of-practice, some form of credentialing, mandatory registration (or endorsement) and continuous professional development are mandatory to NPs in most countries to ensure patient safety, high standards of care and transparency. However, concerning other APN roles, many countries have decided not to regulate the scopes-of-practice of these roles (see Table 5), contrary to the ICN recommendation.

141. As discussed in section 4.1, the design of governance and regulation policies can have either positive or negative implications on the uptake of advanced practice. Regulations, if enshrined in laws or bylaws, are difficult and time-consuming to change, inflexible and any changes often opposed by various stakeholders and therefore can act as barriers to expanded practice (Maier and Aiken, 2016b). Policy options include periodic reviews of laws (such as in the Netherlands) to assess if the laws are still up to date and recommendations for possible modernisations. Other options include experimental clauses or piloting allowing new skills and competencies to be implemented into routine care within a defined time period, linked to evaluations (Table 9).

Table 9. Governance and regulation: enablers to practice uptake

Regulation	Locus	Potential implications on advanced practice	Measures to enable advanced practice uptake
Yes	National regulation	• National laws – if overly restrictive pose barriers to advanced practice uptake, slow to change	• Periodic reviews of existing laws (NL); • 'Experimental law' or state-wide piloting linked to evaluation (NL, US state of California); • Self-regulation by competent authority/ regulatory body (e.g. Australia, New Zealand)
Yes	Sub-national regulation	• Subnational laws – risks of state/province differences in official practice, less role clarity	• Consensus model (Canada, US) toward harmonisation
No, non-regulatory instruments	Local or employer-based governance	• Risks of large differences across settings, limited role clarity, limited patient safety/malpractice handling options	• Employer-based mechanisms, e.g. collaborative arrangements (UK), protocols, quality and educational minimum requirements

Notes: NL=Netherlands, UK=United Kingdom, US=United States

Source: Based on Maier (2015)

142. A third policy option is self-regulation, whereby governments delegate regulation to nursing regulatory bodies, as it exists for the medical profession in many countries, and for NPs in New Zealand and Australia, for instance. Self-regulation means that regulatory bodies determine official scope-of-practice based on the competencies, skills and knowledge of NPs or other APNs (Maier, 2015, Carney, 2016). One advantage is that regulatory bodies can update scope-of-practice faster if educational programmes and competencies change, than if this is determined by legislation and regulation (Maier and Aiken, 2016a). In decentralised regulatory environments, developments have often focused on harmonising official scope-of-practice, such as in Canada and the United States. Policy options include consensus models agreed by major stakeholders to harmonise scopes-of-practice across the country. Yet these have shown to be time-consuming to change, particularly in countries with many sub-national jurisdictions.

143. Finally, non-regulatory governance options have the advantage that they do not require legal or other regulatory changes to authorise official practice. Levels of practice, however, are determined at the individual provider level, leading to large variations in practice. Some of these risks can be mitigated by introducing minimum harmonised requirements for collaborative agreements or protocols, as well as minimum educational requirements to educate APNs with recognised competency levels. But this approach is not recommended for NPs or other nurses working fully or largely independently.

Financing and payment policies

144. Financing and payment policies can considerably influence the uptake and integration of new roles in health care settings. Yet, the effects of payment and reimbursement policies have rarely been evaluated, with the exception of a few empirical studies primarily conducted in the United States. Moreover, as discussed in section 5.3, the evidence on the costs and potential efficiency gains of NPs and other APNs is mixed and potentially influenced by a range of factors, including nurses' productivity, level of remuneration,financing and payment schemes, barriers to practice and supervisory requirements. Hence, policy-makers aiming to implement reforms with the purpose of reducing costs should be aware of the inconclusive evidence base. Payment policies need to be carefully designed as to identifying adequate salary levels and reimbursement rates and implications

on: sufficient attractiveness for the uptake of new advanced roles, affordability and sustainability of new roles; and any potential unintended effects of setting the remuneration levels too low or too high.

Table 9. Financing and payment policies for nurses in advanced roles: implications and enablers to practice uptake

Payment system and financial incentives	Level of Reimbursement	Potential implications on advanced practice and costs	Measures to enable practice uptake
Fee-for-service payment	No reimbursement of advanced roles/services	Hinders uptake of new roles	Amending policies: Inclusion of new roles in payment policies (Australia)
	Reimbursed at a lower level than physicians for the same services	Can help achieve cost savings, but may lead to limited uptake (if the rates are too low) or limiting cost savings (e.g., billing under physicians' name as in the United States)	Measures to enhance billing transparency, e.g. co-signature of NP or mandatory use of provider number
	Reimbursed at the same rate as physicians for the same services	Can result in higher uptake of new roles and expand practice, but achieve little if any cost savings	Measure to attract nurses working in advanced roles to underserved areas/regions (e.g. rural areas) or for specific vulnerable groups
Financial incentives or penalties to kick-start uptake	Financial incentives, e.g. to practices to employ nurse in advanced roles	Can create additional demand and uptake of new roles, but might involve some upfront costs	Use of financial (dis-) incentives to accelerate nationwide uptake (Estonia, Lithuania)

Sources: authors', developed based on Chapman et al. (2010), Poghosyan et al. (2013)

145. A substantial barrier to nurse role advancement in countries where fee-for-service remains the predominant mode of payment is the lack of any reimbursement of the clinical activities of nurses taking up expanded roles (Table 9). In the United States, which is the country with the longest tradition of NPs, there are still private health plans that do not recognise NPs as primary care providers.

146. Moreover, the level of reimbursement of NP and other APN services compared to physicians will affect the incentives for the nursing professions to take on these new roles and the costs for payers. Some cost savings might be achieved if services provided by NPs or other APNs are reimbursed at a lower rate than if provided by physicians. If the rates are too low however, there may be limited incentives for them to take on these new tasks. In countries where NPs are employed primarily in salaried positions, their uptake in practice is influenced by the possibility for employers to secure sufficient funding to create new positions, which is often competing with other budget requests in the context of budget constraints.

147. Finally, financial incentives or dis-incentives (penalties) to influence the uptake of nurses in advanced roles in practice can have a considerable impact, as was shown in Estonia and Lithuania. Yet, more evaluations are required in countries with different payment models, as to policy lessons on their transferability across countries.

Service delivery and organisational settings

148. While some policy instruments and incentives can be used to encourage the uptake of new nursing roles in practice, the final decisions to recruit and employ nurses in advanced roles are in most cases taken by managers in different health care settings. The uptake of advanced roles in various health care settings is influenced by a number of factors, including the local availability of physicians and NP/APNs, leadership to overcome resistance to changing traditional service delivery models, the work environment and openness for change.

149. Health care organisations and providers based in rural areas in many countries are often at the forefront of employing nurses in advanced roles, simply because there are fewer physicians and the need to recruit other qualified providers is greater than in urban areas, as demonstrated in Australia, Canada or the United States.

150. Yet, in all regions and settings, leadership support, organisational culture and work environments play a crucial role in the integration of new professional roles. Managers and board of directors make the initial employment decisions and determine whether and how many providers they need with which skills. They also play an important role in encouraging the integration of providers with advanced competencies into teams. Good management practices include formal programmes, such as induction or orientation programmes, mentoring and peer support, among others. The work culture and informal support provided by colleagues have also shown to influence the uptake and integration of new, advanced nursing roles within organisations.

6.2. International level: Fostering the sharing of data, evidence and policy lessons

151. This paper has provided an overview of recent developments on nurses in advanced roles across OECD and EU countries, along with a synthesis of the latest evaluations, and identified policy levers to enable their integration into practice. Given the recent developments in many countries, regular sharing of policy lessons and evaluations across countries is needed to avoid common pitfalls and foster the successful uptake of advanced nursing roles within countries. Moreover, as the number of countries introducing NPs and other APNs increases globally, several themes emerge that require attention and action internationally:

152. First, cross-country comparisons of the education, skills and competencies of different categories of NPs and other APNs and their titles are required as this workforce grows and moves across international borders. Health professional mobility is increasing globally, and may lead to a skill-loss when health professionals including NP/APNs, move to other countries but cannot work at their levels of qualifications because of lack of recognition, standards or agreed definitions. Minimum-level harmonisation of educational programmes and qualifications of different categories of APNs would be a first step to set similar levels of advanced practice internationally.

153. Second, the increasing size of the NP workforce (and other APNs) increases the importance to monitor this workforce both nationally and internationally. Countries with NP regulation and registration policies generally have routine data available on their numbers. This paper has been able to obtain data on NPs from six countries. It would be useful to expand the country coverage to other countries that have established NP roles and also to broaden the coverage to other APN categories, such as Clinical Nurse Specialists. Greater harmonisation of qualifications and scopes-of-practice of different sub-groups of NPs and other APNs would be a pre-requisite for any robust international data collection. The International Standard Classification of Occupations (ISCO) includes a range of health professions, notably a category of registered nurses (called “professional nurses” in ISCO-08), but as it stands it does not include any further breakdown for NPs and other APNs. A separate inclusion of NPs – as a first step – in ISCO and in international health workforce databases would improve the visibility and monitoring of this workforce.

154. Third, while there is a large body of research on the quality, effectiveness, and patient satisfaction of nurses working in advanced roles, there is limited knowledge on cost implications. Moreover, there continues to be a scarcity of cross-country research on the barriers and policy levers to facilitate implementation. More implementation research is required on the effects of regulation and payment policies on the uptake of new roles in different country and care settings that take account of intended (and unintended) consequences. Initiatives at the global level to improve definitions of NP and other APNs, to set minimum advanced practice levels and to improve global data collection and comparability, would contribute to enhanced monitoring of this workforce. More international collaboration and enhanced sharing of data, research and evidence on good practice would facilitate the sharing of policy lessons in various countries.

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ANNEX

Table A1. Specialisations of NP/APN in selected OECD countries

Country	Title(s)	Specialisation with partial or full focus on primary or outpatient care
Australia	NP	Examples include: Women's health, Community and primary care, Oncology, Mental health, Pediatric care, Palliative care
Canada	NP	Variations across provinces/territories: e.g. in Ontario: Primary health care, pediatrics, adult health
Ireland	ANP	Examples include: Acute Adult Care, Children's Care, Public Health, Addiction and mental health
Netherlands	Nurse Specialist *(Verpleegkundig Specialist)*	Five specialisations exist: Acute care, Preventive care, Intensive care, Chronic care, Mental health. The majority of nurse specialists work in hospital, few in primary care
New Zealand	NP	Examples include: NP Adult Acute Care, Child Acute Care, Youth/Adult Health Condition, NP Lifespan Primary Health, among others
United Kingdom: England, N. Ireland, Scotland, Wales	Nurse consultant, ANP, NP	Various specialisations exist
United States	NP (APRN)	NPs in Adult Health, Family Health, Women's Health, Pediatric care, Geriatrics, Mental Health, among others

Notes: NP=Nurse Practitioner, APRN=Advanced Practice Registered Nurses, ANP=Advanced Nurse Practitioner

Source: authors, based on TaskShift2Nurses Survey 2015 and Begley et al. (2013).

Table A2. Nurse prescribing authority and requirements by country

	Extent of prescribing authority	Major laws enacted / references	Requirements
Australia	NP: Since 2001 (2000 in New South Wales) full prescriptive authority within scope of practice, determined by federal laws and influenced by state/territory policies. Levels of independence vary by medicine from initiation to continued prescribing.	Nursing and Midwifery Board of Australia (2014)	Endorsement as NP, collaborative arrangement with physician
	Scheduled medicines RN (rural and isolated practice): authorised to administer and supply a pre-defined set of medicines in rural and isolated practices, following a health management protocol approved by the employer and a pre-defined formulary, defined at state/territory level (Queensland Government, 2014) .	Nursing and Midwifery Board of Australia (2010)	Endorsement as Scheduled Medicines RN, health management protocol with employer
Canada	NP: Full prescriptive authority, including certain controlled drugs under federal statute since 2012, yet each province has to grant authority, NPs are required to undergo additional training to prescribe controlled drugs. Generally, triplicate prescriptions (e.g. morphine, Ketamine, Ritalin) require stricter regulations by the Drug Enforcement Agency and the Department of Public Safety.	Government of Canada (2012)	NP registration, additional requirements for controlled drugs
	RN: Limited prescriptive authority is *in development* in some provinces and territories for RN prescribing in selected clinical settings (British Columbia, Alberta, Saskatchewan, Manitoba, Quebec, Newfoundland and Labrador)	Canadian Nurses Association (2015)	In development, requirements vary

	Extent of prescribing authority	Major laws enacted / references	Requirements
Cyprus	APN Master's level holders: limited prescriptive authority was granted in 2012 by a new law on nurses' scope of practice. However, as of 2016, nurse prescribing was not implemented in practice, since no individual request had been made to the Ministry of Health (yet) for prescribing authority on an individual basis.	Ministry of Health Cyprus (2012)	APN Master level graduates, including pharmacology course of 6 ECTS, authorisation by Ministry of Health
Denmark	All RNs meeting the requirements are authorised to prescribe within strict regulations under physician oversight, called "frame prescriptions" following standardised clinical guidelines. Frame prescriptions define who is allowed to prescribe, what medications and for whom (group of patients or individual patients). Examples of medications are pain medications, anti-coagulations, others as specified, primarily in hospital settings. In primary care, very few municipalities have "frame prescriptions" which are very limited in scope; GPs can set up individual frame prescriptions with nurses employed in their practice, hence prescribing rights vary by GP practice but are usually limited.	Order No. 1219 of 11/12/2009 (Ministry of Health Denmark, 2009)	RNs with additional training as specified in individual frame prescriptions with the physician
Estonia	RNs: Legislation was adopted in December 2015, authorising limited nurse prescribing for nurses working with family physicians as of 2016. Prescriptive authority is limited, e.g. certain medications for diabetes, hypertension, and primarily continued prescribing after initial prescriptions by a physician.	Government of Estonia (2015)	Nurses working together with a family physician (*pereast*), having passed a clinical pharmacology course, and are registered as nurse prescribers in the national register
Finland	RNs: In 2010, legislation came into force, introducing limited prescriptive authority for nurses. A national formulary of medicines and minimum education was regulated in 2011. Nurse prescribing is authorised for all nurses meeting the requirements. The range of prescriptive authority granted is limited to medicines for initial prescriptions (e.g. local anesthesia, medicines for pharyngitis, contraceptives), and continued prescribing only (e.g. certain medications for hypertension, diabetes, asthma)	2010 Decree 1088 and 2011 regulation on postgraduate education (Ministry of Health and Social Services Finland, 2010)	All nurses, if (i) employed with municipal health center (ii) 3-year work experience (iii) postgraduate education on nurse prescribing, 45 ECTS (iv) authorised by physician (v) registered as prescriber, and (vi) identification number with National Supervisory Authority for Welfare and Health

	Extent of prescribing authority	Major laws enacted / references	Requirements
Ireland	RNs: Since 2007, nurses - if registered as Nurse Prescribers - can prescribe independently any medication within their scope of practice, upon the condition of collaborative practice agreements. No pre-defined formulary or list of drugs exists. Registered Nurse Prescribers can also prescribe certain controlled drugs, however, limits and further restrictions exist.	2007 Pharmacy Act (Government of Ireland, 2007), plus 2010 Nurse Rules	All nurses with (i) degree level in nursing; (ii) registered as nurse and nurse prescriber (iii) 3-year experience (iv) employed at least one year in the specialty where they wish to prescribe (v), prescribing course (vi) collaborative agreement
Nether-lands	Nurse specialists (Master in APN): includes all licensed medicines for all medical conditions within specialty area, through adoption of the 2011 so-called experimental law, enacted in 2012 for five years until further evaluation (Article 36A, Individual Healthcare Professions Act)	2011 experimental law (Dutch Government, 2011)	Nurse Specialists with Master's degree in APN, registered in the Dutch nurse specialist register
	Three specialised nurses: limited prescriptive authority for specialised Bachelor-level nurses, namely, diabetes care nurses, lung nurses and oncology nurses, following protocols and after initial diagnosis by a physician (Article 36, Individual Healthcare Professions Act)		Diabetes, lung and oncology nurses with Bachelor's degree and completion of pharmacotherapy course at a university of applied science

	Extent of prescribing authority	Major laws enacted / references	Requirements
New Zealand	NPs: full prescriptive authority since 2013 under the Medicines Amendment Act within the specialty. The 2014 Misuse of Drugs Amendment Regulations authorised NPs to prescribe controlled drugs within their scope of practice for up to one month's supply for Class A and B and up to three months' supply for Class C controlled drugs.	2013 legislation (Parliament of New Zealand, 2013, Parliament of New Zealand, 2014)	NP endorsement in registry
	Diabetes nurse prescribers: since 2011, diabetes specialist nurses if authorised as diabetes nurse prescribers can prescribe common medicines for patients with diabetes in partnership with medical practitioners	2011 regulation within the Medicines Act for Designated prescribers	RNs with specialisation in diabetes, authorised as diabetes nurse prescriber by the Nursing Council of New Zealand
	RN prescribing: *in development*. In November 2015, the New Zealand Government agreed that RNs working in primary health and specialty teams would become designated prescribers meeting qualification standards. Regulations will allow suitably qualified RNs working in primary health and specialty teams to prescribe specified medicines. The medicines RNs will be allowed will be specified in the Medicines Act and in amendments to the Misuse of Drugs Regulations.	2015 Government decision (Cabinet paper) (Ministry of Health New Zealand, 2016)	Criteria and qualification standards *in development*
Poland	RN: In 2015, a law has been adopted on limited prescriptive authority for nurses, taking effect in January 2016. Nurses with a Master's degree will be allowed to prescribe certain medications autonomously, whereas nurses with a Bachelor's degree will be only allowed to perform continued prescribing Prescribing is restricted to a formulary, structured according to 12 groups of medicines containing active substances as defined by the law (Portal for Nurses and Midwives Poland, 2015). The groups of active substances include anti-emetics, gynecological drugs, anti-infective drugs for anemia, anti-infectious drugs in general (diseases of the throat, ear, sinus, urinary tract infection), locally acting anesthetics, analgesics, anti-parasitic drugs, bronchodilators, vitamins and infusion fluids for intravenous infusion.	Ministry of Health Poland (2015).	All nurses with at least a Bachelor or Master degree having passed an additional specialist course, e.g. on pharmacology (of 65 hours, including 45 hours theory and 20 hours clinical training/practice) and obtained the competencies. Transitional arrangements will be put in place. As of 2016, five universities have established courses on nurse prescribing

	Extent of prescribing authority	Major laws enacted / references	Requirements
Spain	RN: Limited prescriptive authority as of 2016, following adoption of a law in 2015. Independent prescribing is authorised only for over-the-counter medicines and certain health care products. For all other medications, nurses can only prescribe following clinical practice guidelines and under physician supervision. Moreover, since all clinical practice guidelines must be approved by the Nursing and Physician Councils and the Ministry of Health, implementation and uptake may take time.	Ministry of Health; Social Services and Equality Spain (2015)	All RNs having passed a pharmacology course of 6 ECTS
Sweden	RN: Limited prescriptive authority for all registered nurses having successfully completed courses in pharmacology and pathology, and granted a prescribing code. Nurses are then allowed to prescribe from pre-defined list of medicines and vaccines, structured according to 15 areas, including diseases of the throat and mouth, gastrointestinal diseases, urinary tract diseases, dermatological diseases, infections, pain management, ear, nose and throat, and eye-related conditions, among others. All prescriptions are registered in a national system.	Swedish National Board of Health and Welfare (2015)	All RNs having successfully passed courses in pharmacology and pathology, length varies by prior qualifications (from no additional training, e.g. for district nurses, to 30 ECTS for nurses with basic primary RN education of 180 ECTS). Other requirements: employment with county council, primary, home health or elderly care; application to the National Board of Health and Welfare, individual prescribing code.
United Kingdom (England, Northern Ireland, Wales, Scotland)	RN: as *Independent* Prescriber: since 2012, authorised to prescribe any medicine for any condition, including controlled drugs within specialty and competency; *Supplementary* prescriber: a voluntary partnership between a physician and the nurse allowing to prescribe medicines as set out in a patient-specific clinical management plan, after the diagnosis by the physician; prescribing partnership with physician is required	Royal College of Nursing (RCN) (2012)	Requirements: (i) independent prescriber: post registration prescribing course, annotation in registry, at least three years post-registration clinical nursing experience, support from employing organisation, have a designated medical practitioner to support the student with supervision; (ii) supplementary prescriber: can prescribe medicines in patient-specific clinical management plan, after diagnosis by physician; prescribing partnership with physician required

	Extent of prescribing authority	Major laws enacted / references	Requirements
United States (U.S.)	NP: Full prescriptive authority. One state (Florida) has restrictions on controlled drugs. Physician oversight requirements vary by state: as of 2015, 22 U.S. states and Washington D.C. grant full, independent practice to NPs, whereas collaborative agreements or other measures are required in 28 states (Phillips, 2016)	U.S. state-specific regulations (Phillips, 2016)	License to practice as NP at U.S. state-level
	CNS: approximately 25% of all CNS are authorised to prescribe medications (U.S. National Association of Clinical Nurse Specialists, 2015)	U.S. state-specific regulations	Licensed to practice as CNS, additional requirements vary by state, usually an additional pharmacology course required

Notes: France is not included in the table, as the decrees of the 2016 law have not been adopted yet; NP=Nurse Practitioner, RN=Registered Nurse, CNS=Clinical Nurse Specialist, APN=Advanced Practice Nurse

Sources: TaskShift2Nurses Survey 2015, and sources cited directly in the table

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