

# **Nurse prescribing**

**A study on task substitution and professional jurisdictions**

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**Nurse prescribing:  
A study on task substitution and  
professional jurisdictions**

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# **1**

## **General introduction**



## Task substitution and the professionalisation of nursing

In the current climate of cost containment in health care, governments increasingly see the shifting of tasks from physicians to nurses as a suitable policy response. The aim of task substitution is to provide health services in the most efficient and effective way, while simultaneously maintaining and improving the quality of care [1-3]. Moreover, task substitution is seen as a strategy to alleviate the shortage of health professionals [4,5].

At the same time, the nursing profession has been under-going a process of professionalisation in many Western countries over the last decades [6,7]. Porter [8] and Gerrish *et al.* [7], for example, describe several strategies of occupational advancement used by nurses over the past few years, such as the introduction of Master's level nurse education, aimed at expanding the scope of nursing practice.

The combined processes of task substitution and professionalisation within nursing have resulted in nurses taking up new positions – such as the role of the clinical nurse specialist in the UK and the nurse specialist in the Netherlands [9-11] – and new tasks. Nowadays, there are even services that are completely nurse-driven. Nurse-led clinics for example, in which patient care is completely managed and organised by specialised nurses, have become commonplace internationally in recent years [12,13]. In view of the challenges that many countries are facing in responding to growing healthcare workforce shortages and limitations to financial resources, it is expected that task substitution will continue to expand in the coming years [14,15]. One of the most prominent developments in this regard, often as part of broader task substitution processes, has been the partial shift of the task of prescribing medicines from doctors to nurses. Much is expected of task substitution and nurse prescribing in particular. In the UK, it has been claimed that many of the quality targets set by the Department of Health for the primary care setting will rely on nurses taking on new roles [16]. In the Netherlands, nurse prescribing is expected to contribute to efficient and effective patient care and to improve the quality and continuity of care [17,18]. In situations where nurses work independently, such as in nurse-led clinics, their ability to prescribe medicines significantly contributes to efficient and effective patient care.

When nurses start prescribing medicines, they enter an area that has traditionally been the sole domain of the medical profession [19-21]. This has consequences for the relationship between the medical and nursing

professions and for the division of jurisdictional control over the prescribing task. Up to now, little theory-based empirical research has been conducted into the consequences of nurse prescribing for the nursing and medical professions and for the division of jurisdictional control over prescribing between the two professions at the macro and micro levels. The implementation of task substitution is influenced by various contextual factors, such as the structure of the healthcare system, professional domains and the interests of various groups of healthcare professionals [11,16]. Therefore, it is important to study the legal, professional and organisational contexts within which nurse prescribing is implemented [15,22,23]. The research described in this thesis focuses on the forces that led to the introduction of nurse prescribing in Western countries and the conditions under which nurse prescribing has been implemented. Furthermore, the processes will be examined that are going on within the nursing and medical professions and at the interface between them where nurse prescribing is concerned, both at the legislative level and in the workplace. To fully understand the significance of the substitution of nurses for doctors in the task of prescribing medicines, the next section describes what the act of prescribing actually encompasses and its significance in modern healthcare practice.

## **Prescribing medicines**

The act of prescribing medicines is a major clinical intervention for practitioners and is a central part of modern medicine [24-27]. Since ancient times, mankind has tried to avert, treat and combat diseases with the use of substances and resources from the immediate environment [28]. The risks associated with the use of medicines – including addiction and undesirable adverse effects – grew with the growth in the number of medicines available and rapid developments in chemistry. As a result, the use of medicines became increasingly regulated by legislation, and control was transferred to the medical profession. From the early nineteenth century onwards, public access to many medicines became limited and more and more medicines became exclusively available on prescription [29]. The practice of prescribing expanded in modern times as the number of pharmacological therapies, devices and treatments continually increased [30]. Currently, pharmacological therapy is the most common approach to the treatment of disease and the use

of prescription-only medicines is the norm [24,29]. However, it should be noted that recently a trend can be discerned in which some categories of prescription-only medicines are being reclassified as non-prescription medicines, i.e. over-the-counter medicines [31].

Prescribing is a major element in the delivery of health care and medicines have a significant effect on the health of individuals. Inappropriate prescribing can cause serious harm and represents a clinical and economic burden to patients and society [32,33]. Because of the important role of prescribing in healthcare delivery, the value and prestige attached to the act of prescribing are significant [34-36]. Moreover, as Van der Geest *et al.* [27] and Britten [25] note, there is much more to prescribing than meets the eye. Besides its clinical effects, prescribing for example demonstrates power, as the prescriber provides access to a desired product. Hence, prescribing is a sensitive subject in health care, as it involves both patient safety issues and status issues.

### **Non-medical prescribing**

Ever since the majority of medicines became exclusively available on prescription, the task of prescribing medicines has been the domain of the medical profession [19-21]. However, in the current climate of task substitution in health care, the prescribing of medicines is increasingly being outsourced to nursing and other allied healthcare professionals. This is called 'non-medical prescribing'. The term non-medical prescribing is used to describe the prescribing practices of professional groups who are permitted to prescribe medicines but who do not fall under the professional healthcare category of doctors and dentists [37]. Non-medical prescribing is a relatively recent phenomenon in most countries and constitutes a growing international practice [38,39]. Currently, non-medical prescribing is moving forward to include nurses, pharmacists, physiotherapists, midwives and other allied health professionals [40,41]. This thesis focuses on one particular form of non-medical prescribing, namely nurse prescribing.

### **Nurse prescribing**

During the past decades, the number of countries that have introduced nurse prescribing has grown considerably (see Chapters 3 and 4 of this thesis and

[42,43]). In view of this development, important questions have been raised about whether nurse prescribing is safe and clinically appropriate [36,44-49]. The following chapter in this thesis addresses these questions by providing an overview of the effects of nurse prescribing compared to physician prescribing (see Chapter 2).

Despite the growing number of countries introducing nurse prescribing, a comprehensive definition of nurse prescribing does not exist. Rather, the term 'nurse prescribing' can best be described as an umbrella term that covers a wide range of practices. In general, when speaking about nurse prescribing, no distinction is made between the type of nurse who is prescribing, e.g. a registered nurse educated to Bachelor's level or a nurse specialist educated to Master's level. Moreover, various categories of nurse prescribing have been discerned (see for example [50-52]). In the literature, three main models of nurse prescribing are usually distinguished: independent nurse prescribing, supplementary nurse prescribing and nurse prescribing based on patient group directions [50,51].

### ***Independent nurse prescribing***

Independent nurse prescribing is done by legally permitted and qualified prescribers who are responsible for the clinical assessment of a patient, the establishment of a diagnosis and decisions about the appropriateness of a medicine, treatment or appliance, including the issuing of a prescription [50,51,53,54]. Independent nurse prescribing usually takes place from a limited formulary – a list containing a limited and defined number of medicines that can be prescribed – or an open formulary. This type of prescribing is also referred to as 'initial prescribing', 'autonomous prescribing', 'substitutive prescribing' and 'open prescribing' [55,56].

### ***Supplementary nurse prescribing***

Supplementary prescribing is defined as a voluntary partnership between an independent prescriber – a doctor or a dentist – and a supplementary prescriber – usually a nurse or a pharmacist. After the initial assessment and diagnosis of a patient's condition have been carried out by the independent prescriber, the supplementary prescriber may prescribe from an open or limited formulary and will collaborate or consult with the independent prescriber before issuing the prescription, even though direct supervision is not required [50,51,55,57].

### ***Nurse prescribing based on patient group directions***

Patient group directions (PGDs), formerly known as group protocols, refer to written instructions for the supply and administration of named medicines in an identified clinical situation [55,56,58,59]. Drawn up by a multidisciplinary team, they are specifically designed for a particular group of patients with a specific condition, thus excluding individualised prescriptions [60]. Group protocols should not be seen as independent prescribing, since nurses or other healthcare professionals are only allowed to supply and administer medication within the strict terms of a predetermined protocol, albeit using their own assessment of patient needs [59,61].

These models are fairly broad and do not do justice to the different interpretations and general diversity that is found across countries when it comes to nurse prescribing. As said before, to fully understand the implementation of nurse prescribing across countries, it is important to study the legal, professional and organisational contexts within which nurse prescribing is implemented [15,22,23]. Yet up to now, fairly little attention has been paid to the conditions under which nurse prescribing has been implemented internationally. As McKee *et al.* [2] note, changes in professional roles are frequently not even described in a structured way. To address this deficiency, this thesis focuses on the legal, educational and organisational conditions under which nurse prescribing has been introduced internationally. After all, two crucial aspects in the organisation of nurse prescribing are legislation and education [62], since these aspects determine who can prescribe and what can be prescribed. How legal and educational conditions translate into practice is largely determined by the organisational conditions in place.

The introduction of nurse prescribing has consequences for the relationship between the nursing and medical professions and for the division of jurisdictional control over prescribing as well. What was traditionally the exclusive domain of the medical profession is now being extended to include nurses. Little theory-based empirical research has been conducted into the consequences of nurse prescribing for the two professions and for the division between them of jurisdictional control over prescribing. Therefore, this thesis studies the processes going on within and at the interface between the nursing and medical professions where the substitution is concerned of nurses for doctors in the prescribing task, and the division of jurisdictional control over prescribing at both the macro and the micro level.

The thesis incorporates both an international perspective and a particular focus on the Netherlands. Research was conducted on an international basis to study the effects of nurse prescribing and present a comparison and overview of the conditions under which nurse prescribing has been realised. However, the focus is on the Netherlands in the examination of the interprofessional processes surrounding the substitution of nurses for doctors in the prescribing task and the division of jurisdictional control over prescribing at both the macro and the micro levels. The Netherlands started an introduction process for nurse prescribing relatively recently and granted nurse specialists legal authority to prescribe in January 2012. The Netherlands is therefore well suited as a case for studying processes leading to the introduction of nurse prescribing as well as for studying nurse prescribing in everyday practice. Therefore, before moving on to the theoretical framework, a short overview of developments in nurse prescribing in the Netherlands will be given.

### **Nurse prescribing in the Netherlands**

A number of important changes took place in the Dutch legal framework for health care over the past few decades that paved the way for task substitution and the introduction of nurse prescribing. Several reports appeared that recommended task substitution in Dutch health care (e.g.[63,64]). Moreover, in view of the expected capacity problems in health care and professional developments taking place on the work floor, the Dutch Ministry of Health developed a positive attitude towards task substitution, stating that task substitution would enable the optimum utilisation of health care professionals in terms of quality and efficiency. In 2006, an amendment to the Individual Healthcare Professions Act was adopted by the Dutch House of Representatives that added the prescribing of prescription-only medicines as a reserved procedure to Article 36 of the Individual Healthcare Professions Act, and specified that categories of specialised nurses, under certain conditions, were one of the healthcare professions authorised to perform the procedure [65]. In December 2011, the Individual Healthcare Professions Act was changed to include the possibility of task substitution (Article 36A), including prescribing, for physician assistants and nurse specialists (with a Master's degree in Advanced Nursing Practice). As of January 2012, Dutch nurse specialists are allowed to prescribe any licensed medicine for any medical

condition within their specialism and competence. Specific categories of registered nurses (RNs), namely diabetes care nurses and lung nurses, started prescribing on 1 February 2014. From 1 September 2014 onwards, oncology nurses will also be allowed to prescribe a limited number of medicines [66]. Box 1.1 presents an overview of the legal framework concerning nurse prescribing in the Netherlands as at February 2014.

Box 1.1 Legal framework concerning nurse prescribing in the Netherlands as at February 2014

Nurse prescribing is governed by two acts in the Netherlands: the Medicines Act (Dutch: *Geneesmiddelenwet*) and the Individual Healthcare Professions Act (Dutch: *Wet BIG*). The Medicines Act regulates processes around the production, marketing, prescribing and distribution of medicines. The Individual Healthcare Professions Act protects the quality of care provided by healthcare professionals and protects patients against improper and careless conduct by healthcare professionals.

**Dutch Medicines Act**

Article 1 of the Medicines Act defines a ‘prescription’ as follows:

“A document prepared by a practitioner with specified name and work address as defined in Article 36, paragraph 14 of the Individual Healthcare Professions Act, or a practitioner designated in another Member State, that gives a prescription to a person or body as defined in Article 61, paragraph 1, to dispense a medicine, designated by product name or brand name, in the specified quantity and strength and with the specified method of use to an identified patient, and that is signed by the designated professional or, if without a signature, is protected by a code such that a competent person or authority may establish its authenticity.” (Medicines Act, Section 1(1) pp)

**Dutch Individual Healthcare Professions Act**

The Individual Healthcare Professions Act is relevant for nurse prescribing as it regulates which healthcare professionals are authorised to perform certain reserved procedures, including the prescribing of medicines. Nurse prescribing is regulated by two different articles in the Individual Healthcare Professions Act: one for nurse specialists (with a Master’s degree in Advanced Nursing Practice) and one for registered nurses (who hold a Bachelor’s degree and in addition have successfully completed a ‘Pharmacotherapy’ module at a university of applied sciences).

***Prescriptive authority for nurse specialists***

Dutch nurse specialists have been allowed to prescribe any licensed medicine for any medical condition within their specialism and competence since January 2012. Their prescriptive authority is regulated by Article 36A (the so-called ‘experimental article’) of the Individual Healthcare Professions Act. This means that nurse specialists are allowed to perform reserved procedures, including the prescribing of medicines, for an

*Box 1.1 - To be continued -*

experimental period of five years. Upon positive evaluation, a permanent arrangement may be included in the law that will grant nurse specialists permanent authority to perform reserved procedures, including prescribing. There are five nurse specialisms in the Netherlands, namely acute care, chronic care, intensive care, preventive care and mental health care [17,18].

Nurse specialists are a relatively new group of professionals in the Netherlands. On 27 January 2009, the title 'nurse specialist' was officially recognised by the Minister of Health, Welfare and Sport and it has been legally protected since then [67]. Nurse specialists work at the interface between medical and nursing care, and treat defined groups of patients with whom they establish an individual treatment relationship [68]. To be allowed to use the title 'nurse specialist', nurses must have successfully completed a two year Master's degree programme in Advanced Nursing Practice and must afterwards have registered their names in the Nurse Specialist Register (Dutch: *Verpleegkundig Specialisten Register*) [69].

***Prescriptive authority for categories of specialised nurses*** Article 36 (14) of the Individual Healthcare Professions Act states that the authority to prescribe prescription-only medicines can be granted to specific categories of RNs that are designated by a Ministerial Order. The categories of RNs designated by Ministerial Order as authorised to prescribe prescription-only medication are only allowed to prescribe after a diagnosis has been made by a doctor, and they can only prescribe a limited number of medicines within their specialism as specified within protocols and standards. Moreover, to be allowed to prescribe, RNs who fall in one of the designated categories must hold a Bachelor's degree and they must have successfully completed a Pharmacotherapy module at a university of applied sciences. The categories of RNs that are initially designated by Ministerial Order as authorised to prescribe medication are diabetes care nurses, lung nurses and oncology nurses [70]. The Ministerial Order for diabetes care nurses and lung nurses took effect on 1 February 2014, while the Ministerial Order for oncology nurses will take effect on 1 September 2014 [71].

It should be noted that the title 'specialised nurse' is not legally protected and as such is not recognised by Dutch law. Hence, specialised nurses are registered as 'nurse' in the Individual Healthcare Professions-register. Nonetheless, 'specialised nurse' is an established and commonly used title in health care practice. A specialised nurse is a registered nurse (RN), often with a number of years of work experience, who has successfully completed further education in his/her area of professional expertise, e.g. diabetes care, lung care, oncology care, et cetera [72].

## **Theoretical framework of this thesis**

When nurses start prescribing medicines, they enter an area that traditionally has been the sole domain of the medical profession [19-21]. Therefore, the expansion of prescriptive authority to include nurses touches on issues of

professional domains and the division and reallocation of jurisdictional control over the task of prescribing medicines [73]. This thesis seeks to explain the division of jurisdictional control over prescribing between the nursing and medical professions, how it has developed, both at the legislative level and in the workplace, and how professions try to protect/retain their professional boundaries where the prescribing of medicines is concerned. Renegotiations over professional boundaries and professional efforts to secure or obtain jurisdiction over task areas are key themes in the sociology of professions [74]. Hence, we study the introduction and consequences of nurse prescribing from a sociology of professions perspective. The next sections will introduce the core theoretical concepts.

### ***Professions and professionalism***

The medical profession is considered the prototype of a profession [75,76]. The professional status of nursing, on the other hand, has been subject to a long-standing debate and forms a contested issue [77,78]. In this thesis, professions are defined as “exclusive occupational groups applying somewhat abstract knowledge to particular cases” [73]. This definition considers both medicine and nursing to be professions.

The relationship between the medical and nursing professions is usually referred to as the classical case of a dominant profession controlling a subordinate profession [73,75,79], even though it has been shown that blurring and informal crossing of boundaries takes place between doctors and nurses on the work floor [80,81]. Nonetheless, the medical profession seeks to maintain its dominant position in the provision of health care [82,83] whereas the nursing profession tries to increase its professional status [7,8]. The introduction of nurse prescribing can be viewed as a new chapter in the ongoing process of boundary negotiations between the medical and nursing professions.

To understand professional boundary negotiations and occupational changes, sociologists have turned to the idea of ‘professionalism’. Professionalism is increasingly being conceptualised as an ‘ideology’, in that professions hold on to their professional status to preserve their power and control over certain task areas [84]. Freidson [85] has labelled professionalism in this sense as the occupational control of work. It draws attention to the ways in which professions are socially constructed and based upon interdependence, as they compete with each other over jurisdictions [86,87]. Even though this idea had its genesis in the 1960s, it is still relevant as professional jurisdictional disputes

and struggles for control flourish in the current environment of reform and task substitution in healthcare [88].

According to Evetts [84], professionalism can be seen as operational at the macro level (societal, state and market), meso level (organisations and institutions) and micro level (groups and actors). Most studies approach professional negotiations over tasks from a macro-sociological perspective, as in the case of professional negotiations in education [89]. The substantial and distorting influence that workplace jurisdictions can have on legal structures is often disregarded [90,91]. However, as noted earlier, role blurring and informal crossing of boundaries takes place between doctors and nurses on the work floor [80,81]. Therefore, it is important to study workplace jurisdictions at the meso level and micro level as well.

### ***Jurisdictional control over prescribing***

With the introduction of nurse prescribing, professional boundaries have been shifted and the division of jurisdiction between the medical and nursing professions has changed. According to Abbott [73], jurisdiction is crucial for professions. It is their means of continued livelihood [91]. Professionals who are recognised as experts in a certain area, in this case the area of prescribing medicines, typically possess a form of cultural capital whose ownership confers status and power [92]. Within their jurisdictional domains, these professions tend to make more or less exclusive claims to authority over the knowledge and skills that fall within their scope [93]. These professions often enjoy a number of privileges, such as control over professional training, recruiting and licensing [73]. Apart from the direct benefits, these help them to sustain their position in competition with other professions. Therefore, Abbott [73] labels jurisdiction – “the link between a profession and its work” – as the central phenomenon of professional life. Since one profession can preempt another’s jurisdiction or control over a task, professions exist in an interdependent system with competing jurisdictional claims. Hence, the division of labour can be seen as a process of social interaction in which participants continuously negotiate the tasks they perform and the relationship with others that their tasks presuppose [73,88,94]. In the case of prescribing of medicines, doctors and nurses negotiate jurisdiction over the prescribing task, influencing the relationship between the two professions.

When negotiating jurisdiction over tasks, profession can make use of so-called ‘internal’ and ‘external’ forces. These forces shape the competition between professions about jurisdiction over tasks [73]. Internal forces can be classified

as arising from within the professions themselves, and external forces as general social forces. An example of an external force that could possibly shape professional competition over prescribing rights is governmental striving for a more cost-effective healthcare system, whereas an internal force might be nurses' desire for more professional autonomy. Professions can use these internal and external forces to classify a problem to their advantage. For example, by stating that nurses are cheaper prescribers than doctors, nurses' can use the focus on cost containment in health care to their advantage. At the same time, professions will try to show that they are the most appropriate professionals to reason about a task and perform the task. By constructing problems in such a way that their knowledge is acknowledged as expert knowledge, professions can successfully claim jurisdiction over a task [73]. Physicians can for example claim that to be able to prescribe, one needs a 'medical perspective'. Hence, knowledge claims – claims to unique bodies of knowledge and/or expertise – play an important role in achieving jurisdictional control and represent an important vehicle through which professions can rhetorically play out their professional struggles [83,92].

Professional jurisdictional claims can be made in several arenas, i.e. professions can claim control over tasks in the legal arena, the workplace and the arena of public opinion (Abbott, 1988). Applying this to the task of prescribing, nurses can for example seek official legal authority over prescribing or they can negotiate and obtain informal permission by doctors in the workplace to prescribe medicines. The division of jurisdiction over prescribing in the legal arena is determined by the legal and educational conditions that are in place concerning prescribing, as these conditions determine who can legally prescribe and what can be prescribed. The division of jurisdictional control over prescribing in the workplace is largely determined by the organisational conditions in place, as these translate legal and educational conditions into practice, or equally can prevent this happening. Hence, this thesis studies in detail the legal, educational and organisational conditions under which nurses are allowed to prescribe in order to determine the division of jurisdiction over prescribing in the legal and workplace arenas.

While Abbott makes a distinction between jurisdictional control at the macro level (the legal and public arena) and at the micro level (the workplace), his theory is strongly focused on the macro level and pays relatively little attention to the interplay between the different levels and the influence of organisational contexts on jurisdictions, as noted by Bureau and Suquet [95].

In most studies of professional negotiations over jurisdiction, the micro level and its influence on jurisdiction receive too little attention [90,91]. Yet organisational and individual factors at the micro level can mediate the influence of legislation on professional work jurisdictions [22]. Psychological professional barriers among healthcare professionals, for example, have been reported as one of the most persistent problems to the uptake of task substitution in practice, whereas more supportive views among healthcare professionals have been shown to positively influence the uptake of nurse prescribing [64,96-98]. Hence, the views of individual healthcare professionals can have a significant influence on the division of jurisdiction at the micro level and will therefore also be considered in this thesis. Moreover, developments taking place at the micro-level or meso-level may translate into macro-level changes. The introduction of dental hygiene practices in the USA, for example, preceded and eventually led to the actual institutional legalisation of these practices [99]. Therefore, this thesis focuses on macro, meso and micro factors in its analysis of the division of jurisdiction over prescribing between the medical and nursing professions.

Not only does professional competition over jurisdiction takes place in several arenas, it can also have various outcomes. After all, not every profession striving for full jurisdiction will obtain it. Where nurses are able to independently prescribe medicines, with a fair range of prescribing freedom concerning medicine choice, as in the UK, the nursing and medical professions hold equal and full jurisdiction over prescribing. However, this is exceptional. Most professional conflicts over jurisdiction result in so-called “limited jurisdictional settlements” [73]. These are alternatives to the situation in which one or more professions hold full jurisdiction over a task. In a jurisdictional settlement, professions share the jurisdiction over a task, whereby control is distributed to a greater or lesser extent equally between the professions, depending on the type of jurisdictional settlement concerned. Abbott [73] discerns five jurisdictional settlements. These jurisdictional settlements are, for example, useful in classifying the general nurse prescribing models that were discussed earlier in this introduction:

- Subordination: the second most desired outcome of a jurisdictional conflict, whereby an incumbent profession controls the division of labor for one or more subordinate groups. The nursing profession is usually considered to be in a subordinate position to the medical profession.
- Intellectual jurisdiction: in which the incumbent profession controls the cognitive knowledge of an area but allows practice by other professions.

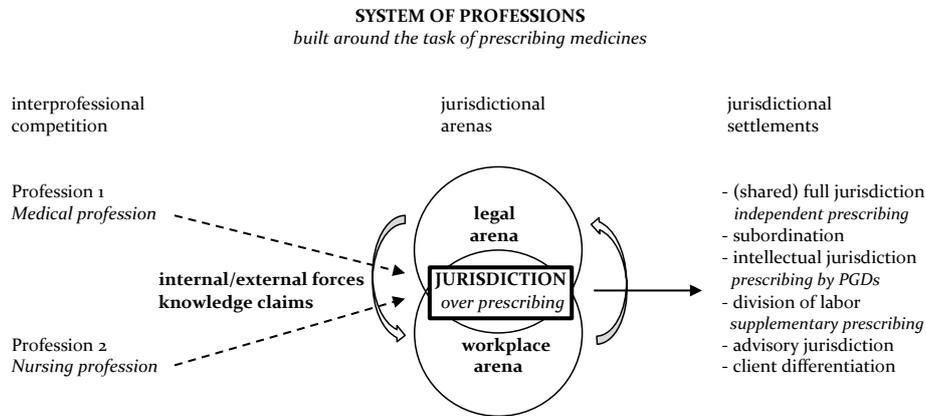
Nurse prescribing based on patient group directions (PGDs) would fit under this jurisdictional settlement. Because PGDs are developed by a multidisciplinary team – usually consisting of doctors, pharmacists and nurses – the ‘intellectual jurisdiction’ over the prescribing task lies with the team, even though nurses perform the actual task.

- Division of labour: in which the jurisdiction over a certain task is divided between professions into functionally interdependent but structurally equal parts. The supplementary prescribing model can be considered a ‘division of labour’ because of the clear delineation of areas of responsibility.
- Advisory jurisdiction: the weakest form of control, whereby a profession seeks a legitimate right to interpret, buffer or partially modify actions another profession takes within its own full jurisdiction. We can speak of advisory jurisdiction when doctors systematically advise nurses in their prescribing decisions.
- Client differentiation: in which segments of a profession serve different client groups. This is considered a workplace settlement. In the case of nurse prescribing, nurses can for example prescribe medication for ‘easy, straightforward’ patients, while doctors remain in charge of the more complex cases in a certain patient population.

Figure 1.1 shows a schematic representation of the theoretical framework used in this thesis (particularly in Chapters 3 to 6 and Chapter 9) to explain the division of jurisdictional control over prescribing between the medical and nursing professions, at the legal level as well as in the workplace. This framework can be applied at both the macro level and the micro level of the analyses. Internal and external forces and professional knowledge claims influence the division of jurisdictional control over prescribing. This thesis will examine the conditions under which nurses are prescribing in order to determine which particular jurisdictional settlements can be discerned between the medical and nursing professions concerning the task of prescribing medicines. At the macro level, the legal jurisdictional settlements between the medical and nursing professions over prescribing can be discerned based on the legal and educational conditions under which nurses are prescribing. For example, where nurses are legally allowed to prescribe according to the general ‘independent nurse prescribing’ model, they share full jurisdiction over prescribing with the medical profession. The division of workplace jurisdictions over prescribing can be determined, and is influenced,

by the implementation of legal and educational conditions in everyday practice, the organisational conditions in place and the views and practices of individual healthcare professionals. Finally, the arrows between the legal arena and workplace arena indicate the reciprocal relationship between the two jurisdictional arenas.

Figure 1.1 Schematic representation of the theoretical framework used in this thesis



## This thesis

### *Aim and research questions*

The aim of this thesis is twofold: firstly, to gain more insight from an international perspective into the effects of nurse prescribing, the forces that have led to the introduction of nurse prescribing and the legal, educational and organisational conditions under which nurse prescribing has been or is being realised; secondly, to investigate the processes going on within and between the nursing and medical professions in the Netherlands concerning nurse prescribing and the division of jurisdictional control over prescribing between the two professions, at the legal level as well as in the workplace. The legal and educational conditions under which nurses are prescribing internationally will be used to determine the legal jurisdictional settlements between the medical and nursing professions over prescribing at the macro level. The division of workplace jurisdictions over prescribing is determined and influenced by the implementation of the legal and educational conditions in everyday practice, the organisational conditions in place and the views of

individual healthcare professionals. The following research questions will be addressed:

1. What are the effects of nurse prescribing on medication and patient outcomes compared to physician prescribing? (Chapter 2)
2. As a result of what internal and external forces was nurse prescribing introduced in Western European and Anglo-Saxon countries? (Chapters 3, 4 and 5)
3. Under what legal, educational and organisational conditions is nurse prescribing realised in Western European and Anglo-Saxon countries? (Chapters 3 and 4)
4. What are the views and expectations of Dutch nursing and medical stakeholders in professional associations regarding nurse prescribing? (Chapter 5)
5. What knowledge claims were used by the medical and nursing profession in the Netherlands to secure or obtain jurisdictional control over prescribing? (Chapter 6)
6. What are the views of Dutch RNs on the consequences of nurse prescribing for nurses' practice and are these views subject to change under the influence of various internal and external forces? (Chapter 7)
7. What are the views of Dutch RNs, nurse specialists and physicians on the consequences of nurse prescribing for the quality of care, the nursing and medical professions, and the relationship between the medical and nursing professions? (Chapter 8)
8. Which jurisdictional settlements can be discerned between nurse specialists and medical specialists concerning the prescribing of medicines in the workplace? (Chapter 9)

### ***Research strategy and outline of this thesis***

This thesis comprises ten chapters, including this introductory chapter. The study followed a mixed method design, aligned with the theoretical perspective that frames it.

In view of the growing number of countries that are introducing nurse prescribing and the questions that have been raised about whether nurse prescribing is safe and clinically appropriate [36,44-49], we started with a systematic review of the literature on the effects of nurse prescribing. The review synthesised the available evidence on the effects of nurse prescribing

on the quantity and types of medication prescribed and patient outcomes when compared to physician prescribing (**Chapter 2**).

Having established the clinical appropriateness of nurse prescribing, we aimed to provide an overview of the forces that led to the introduction of nurse prescribing and of the legal, educational and organisational conditions under which nurse prescribing had been implemented internationally. This allowed us to study whether the internal and external forces that led to the introduction of nurse prescribing were related to the division of jurisdictional control over prescribing, as suggested by our theoretical framework. As systematic reviews are well positioned to make sense of large bodies of information and summarise the state of knowledge of a particular phenomenon of interest [100], a systematic literature review was conducted of the extent to and the ways in which nurse prescribing has been realised across Western-European and Anglo-Saxon countries (**Chapter 3**). The review was supplemented by an international survey among professional nursing and medical associations and government bodies to obtain information missing from the literature (**Chapter 4**). This survey also allowed us to ask nursing and medical associations about what they considered to be the reasons for the introduction of nurse prescribing in their respective countries. Potential differences in their answers could be an indication of professional problem construction by professional associations, often used for retaining or obtaining jurisdiction over certain tasks, as suggested by our theoretical framework.

In the second part of the study, the focus shifted towards the Netherlands. To further investigate Abbott's [73] assumption that professions can use internal and external forces to influence the outcomes of professional conflicts, we conducted interviews with representatives of nursing and medical associations in the Netherlands and asked them, among other things, about the reasons for the introduction of nurse prescribing and their views on nurse prescribing. Respondents' answers represented their association's point of view (**Chapter 5**). As qualitative research is well suited for understanding motives and views and for examining how reality is constructed [101,102], semi-structured interviews were used to collect the data. Since we asked respondents for reasons for the introduction of nurse prescribing which had taken place some years earlier, we decided to complement the interview data with document analysis, as this is a technique well suited for gathering

retrospective data [103]. Moreover, this enabled us to conduct a thematic analysis of the knowledge claims that were used by the medical and nursing professions in the Netherlands when it came to the introduction of nurses' prescriptive authority (**Chapter 6**).

In line with our theoretical framework, which emphasises that professional conflicts over jurisdiction take place at both the macro level and the micro level, we shifted our analysis from the associational level to the level of individual healthcare professionals. By conducting survey research among a national sample of RNs on their views on nurse prescribing, we were able to compare our results with results from a survey conducted six years earlier by the Netherlands Institute for Health Services Research. This enabled us to study if and to what extent developments in the Netherlands, i.e. internal and external forces, changed RNs' views on nurse prescribing (**Chapter 7**). Because the attitudes and support of healthcare professionals for nurse prescribing have a large influence on its implementation and/or uptake in practice, we also studied the views of all relevant individual healthcare professionals in the Netherlands by conducting survey research among national samples of RNs, nurse specialists and physicians (**Chapter 8**).

While survey research has some clear advantages, it is also known that views and attitudes do not always correspond to behaviour [90]. To elaborate on the survey results, a study of nurse prescribing within its natural setting was conducted (**Chapter 9**). This was possible as nurse specialists had just started prescribing medicines in the Netherlands by this time. Because prescribing processes are complex and context dependent, a multiple-case study research strategy was adopted [101,102]. Data on nurse specialists' prescribing practices were collected using a multi-method approach consisting of semi-structured interviews with nurse specialists and physicians, observations of nurse specialists' prescribing consultations and document analysis. Employing a variety of research methods meant that data triangulation was possible to increase confidence in the validity of the findings [102].

Finally, the last chapter of this thesis provides a general discussion of the results presented as well as of methodological considerations, implications for policy and clinical practice, and recommendations for future research.

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# 2

## **The effects of nurse prescribing: a systematic review**

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## **Abstract**

### **Background**

In 2008, we conducted a systematic review on the effects of nurse prescribing using studies with a comparative design. In view of the growing number of countries that are introducing nurse prescribing and the fact that several studies into nurse prescribing have been conducted recently, there is a need for an updated review to reassess the available information on the effects of nurse prescribing when compared to physician prescribing.

### **Objective**

To identify, appraise and synthesise the evidence on the effects of nurse prescribing when compared to physician prescribing on the quantity and types of medication prescribed and on patient outcomes.

### **Design**

A systematic review.

### **Data sources**

In addition to the previous review, which covered the literature up to 2005, eleven literature databases and four websites were searched for relevant studies from January 2006 up to January 2012 without limitations as to language or country. Moreover, full text copies of all studies included in the previous review were reviewed.

### **Review methods**

A three-stage inclusion process, consisting of an initial sifting, checking full-text papers for inclusion criteria and methodological assessment, was performed independently by two reviewers. Data on effects were synthesised using narrative and tabular methods.

### **Results**

Thirty-five studies met the inclusion criteria. All but five studies had a high risk of bias. Nurses prescribe in comparable ways to physicians. They prescribe for equal numbers of patients and prescribe comparable types and doses of medicines. Studies comparing the total amount of medication prescribed by nurses and doctors show mixed results. There appear to be few

differences between nurses and physicians in patient health outcomes: clinical parameters were the same or better for treatment by nurses, perceived quality of care was similar or better and patients treated by nurses were just as satisfied or more satisfied.

### **Conclusions**

The effects of nurse prescribing on medication and patient outcomes seem positive when compared to physician prescribing. However, conclusions must remain tentative due to methodological weaknesses in this body of research. More randomised controlled designs in the field of nurse prescribing are required for definitive conclusions about the effects of nurse prescribing.

## 2.1. Introduction

### 2.1.1. Background

Nurses can legally prescribe medication in quite a number of countries nowadays, including Australia, Canada, Finland, Ireland, New Zealand, Norway, South Africa, Sweden, the Netherlands, the United Kingdom and the United States of America [1-7]. The extension of prescribing rights to nurses has been introduced for several reasons. It is expected, among others, that nurse prescribing will contribute to efficient and effective patient care and will improve the quality and continuity of care [4,6-12]. Moreover, nurse prescribing offers the potential to make better use of nurses' professional skills, increase nurses' autonomy and yield time savings for medical practitioners and patients [4,8,9,13,14].

Even though the term 'nurse prescribing' suffices as a descriptor, the actual practice it refers to varies considerably, both within countries and internationally [4,5,15]. Nonetheless, three general models of nurse prescribing are usually distinguished in the literature, viz. independent prescribing, supplementary prescribing and prescribing based on patient group directions (see Box 2.1). This review will adhere to this general classification.

#### Box 2.1 General models of nurse prescribing

##### ***Independent prescribing***

Legally permitted and qualified independent prescribers are responsible for the clinical assessment of a patient, the establishment of a diagnosis and decisions about the appropriateness of medication, treatment or an appliance, including the issuing of a prescription [16,17]. Prescribing usually takes place from a limited formulary - a list containing a limited and defined number of medicines that can be prescribed - or an open formulary. This form of prescribing is also referred to as initial, autonomous, substitutive or open prescribing [6,18].

##### ***Supplementary prescribing***

Supplementary prescribing is defined as a voluntary partnership between an independent prescriber - a doctor or a dentist - and a supplementary prescriber - usually a nurse or a pharmacist. After the initial assessment and diagnosis of a patient's condition have been carried out by the independent prescriber, the nurse may prescribe from an open or limited formulary and will collaborate or consult with the independent prescriber before issuing the prescription, even though direct supervision is not required [17-19].

*Box 2.1 - To be continued -*

In the United Kingdom, an important additional feature of supplementary prescribing is the collaboration between the independent and supplementary prescribers in drawing up a Clinical Management Plan which needs to be approved by the patient before implementation [19,20]. Supplementary prescribing is also known as dependent, collaborative, semi-autonomous or complementary prescribing [6,18].

***Patient group directions***

Patient group directions (PGDs), formerly known as group protocols, refer to written instructions for the supply and administration of named medicines in an identified clinical situation [6,18,21,22]. Drawn up by a multidisciplinary team, they are specifically designed for a particular group of patients with a specific condition, thus excluding individualised prescriptions [23]. Group protocols should not be seen as independent prescribing, since nurses or other health care professionals are only allowed to supply and administer medications within the strict terms of a predetermined protocol, albeit using their own assessment of patient needs [20,22].

In 2008, the Netherlands Institute for Health Services Research (NIVEL) conducted a systematic literature review of the effects of nurse prescribing using studies with a comparative design [6]. In this review we concluded that overall, the effects of nurse prescribing appeared to be positive. However, of the twenty-three studies that were included in the review, all but two had a high or moderate risk of bias, based on the EPOC criteria [24]. The present systematic review is an update of this earlier review [6]. Since our previous review was published, nurse prescribing has been introduced in two more countries, viz. Finland and the Netherlands [7,25]. Moreover, quite a number of studies and evaluations from other countries have appeared. Nurse prescribing has been in place by now for a substantial number of years in some countries, such as Ireland and the UK, increasing the opportunity for more in-depth research and publications. In view of the growing number of countries that are introducing nurse prescribing and the fact that several studies into nurse prescribing have been conducted recently, there is a need for an updated review to reassess the available information on the effects of nurse prescribing.

While several reviews have been conducted into the legal and/or educational conditions under which nurse prescribing has been implemented in different countries [4,26,27], and other non-systematic reviews have addressed the advantages of nurse prescribing in terms of access and delivery of care and nurses' knowledge and skills [23,28,29], few reviews have examined the effects of nurse prescribing on medication and patient outcomes. These are

important outcome measures though, firstly because nurse prescribing is often introduced to improve the quality of care, of which medication and patient outcomes are important measures. In the second place they are important because questions have been raised about the adequacy of nurses' educational programmes and whether nurses have the competence to prescribe medicines [26,30-35].

As said, in 2008 we conducted a systematic review of the effects of nurse prescribing on medication and patient outcomes using studies with a comparative design. Three other reviews also studied the effects of nurse prescribing, but these lacked a comparative design [6,36-38]. Latter & Courtenay (2004) found that nurse prescribing has generally been evaluated positively [37]. However, their review lacked a systematic approach as well as a comparative design. O'Connell *et al.* (2009) reported advantages of nurse prescribing for both patients and nurse prescribers, but concluded that further research, preferably randomised controlled trials (RCTs), would be useful to determine the benefits of nurse prescribing versus doctor prescribing [38]. Bhanbro *et al.* (2011) conducted a systematic literature review on the contribution of prescribing in primary care by nurses, indicating that nurse prescribing effectively improves patients' condition and provides a better level of care [36]. However, many of the studies included in this review had design weaknesses and limitations, and only two presented comparative data about general practitioners. Hence, these reviews into the effects of nurse prescribing all lacked a comparative design to compare the effects of nurse prescribing to physician prescribing. However, a comparison with the traditional approach of prescribing by medical professionals is a necessary prerequisite in order to properly assess the value of nurse prescribing.

#### **2.1.2. Aim and research questions**

The aim of this updated review was to identify, appraise and synthesise the evidence presented in the literature on the effectiveness of nurse prescribing compared to physician prescribing. We looked for evidence about the effects of nurse prescribing on the quantity and types of medication and on patient outcomes. The following research questions were addressed:

1. What are the effects of nurse prescribing on the quantity and types of medication being prescribed?
2. What are the effects of nurse prescribing on patient outcomes?

## 2.2. Methods

A more stringent update of the systematic literature review by Van Ruth *et al.* [6] was conducted, working in accordance with the steps in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement [39] and the Cochrane Handbook for Systematic Reviews [40]. This update differs from the previous review in that it does not include qualitative study designs. Furthermore, in contrast to the earlier review, we do not address the effects of nurse prescribing on physician and nurse outcomes and characteristics of the health-care system.

### 2.2.1. Search strategy

To identify all relevant studies up to January 2012, the following eleven literature databases and four websites were searched: BioMed Central, CINAHL, Cochrane Database of Systematic Reviews, Current Controlled Trials, Embase, INVERT (Dutch nursing literature index), NIVEL catalogue, PiCarta (Dutch library system), PubMed, Science Citation Index and the Virginia Henderson International Nursing Library, and the website of the UK Department of Health ([www.doh.gov.uk](http://www.doh.gov.uk)), the website of the World Health Organisation ([www.who.org](http://www.who.org)), a website for health professionals ([www.escriber.com](http://www.escriber.com)) and Google Scholar ([www.scholar.google.com](http://www.scholar.google.com)). All databases and websites were searched from January 2006 up to January 2012 without limits as to country or language. The search was highly sensitive. The following search strategy was used for PubMed: (“Nurse prescribing”) OR (Nurs\* [tiab] AND Prescri\* [tiab]) OR (Nurs\* AND prescriptions, drug [MeSH]), and suitable search strategies were developed for the other databases using adaptations of the PubMed search. All the detailed search strategies can be found in the additional file 2.1, ‘Search strategies’. The hits from all the searches were entered into Reference Manager©; duplicates were eliminated in this program and then the inclusion process was carried out.

### 2.2.2. Inclusion and exclusion criteria

Our inclusion and exclusion criteria were structured according to the PICO (Patients, Intervention, Comparison, Outcome) method.

#### *Patients*

All patient groups were included. There was no restriction in terms of age.

### *Intervention*

Studies were included that addressed the nurse prescribing of medicines as defined in one of the three general models of nurse prescribing, i.e. independent prescribing, supplementary prescribing or prescribing by patient group directions. Studies that only concerned nurse prescribing based on group protocols for child vaccination or travel vaccination were excluded, as these severely limit nurses' prescribing rights.

### *Comparison*

Studies needed to have a comparative design in which nurse prescribing was compared to physician prescribing in order to be included in the review. Studies comparing nurse prescribing to prescribing by other non-medical prescribers (e.g. pharmacists) were excluded.

### *Outcome*

All studies were included that reported on the effects of nurse prescribing on the quantity and/or types of medication prescribed and/or on patient outcomes. We did not apply a strict definition of patient outcome measures. All studies with outcome measures that said something about the effects of nurse prescribing on patient outcomes were included (e.g. patients' clinical parameters, satisfaction with care or number of patient visits to the prescriber).

### *Type of study*

Only primary research studies with a quantitative design were included. Studies with a qualitative design and publications that were not primary research studies, i.e. letters, abstracts, reviews and editorials, were excluded.

A three-stage inclusion process was applied. Initially, a 10% sample of all non-duplicate references found in the literature search was studied independently by two reviewers (JD and SG), looking at the title and abstract; references were included in the study if they met the above criteria. It was stipulated beforehand that if there was substantial agreement between the two reviewers for this 10% sample, the remaining 90% of the sample would be divided between them. In accordance with the prevailing cut-off points in the literature, a Kappa value between 0.60 and 0.80 was considered an indication of good/substantial agreement [41]. If the title and abstract provided

insufficient information to determine relevance, full paper copies of the articles were ordered and these articles were included in the second selection round.

In the second stage, both reviewers independently examined all full paper copies of the articles selected in the first stage, in order to determine whether they fulfilled the inclusion criteria. Disagreements were either resolved by discussion or the final decision was made by a third reviewer.

Finally, full text copies of all twenty-three studies included in the previous review [6] were checked by both reviewers to see whether they fulfilled the stricter inclusion criteria of this review.

### **2.2.3. Quality assessment**

The methodological quality of the studies included was assessed independently by two reviewers (JD and SG) using the quality criteria of the Cochrane Effective Practice and Organisation of Care (EPOC) Review Group [24]. Differences were resolved by consensus. The EPOC quality criteria checklist includes seven criteria for randomised controlled trials and controlled clinical trials (CCTs), seven criteria for controlled before-and-after studies (CBAs) and seven criteria for interrupted time series (ITS). The EPOC criteria used to assess RCTs and CCTs are: concealment of allocation, follow-up of professionals, follow-up of patients or episodes of care, blind assessment of primary outcome(s), baseline measurement, reliable primary outcome measure(s) and protection against contamination.

We assigned an overall quality rating (high, moderate or low risk of bias) to each study. A study was judged as having a low risk of bias if it met all seven criteria, a moderate risk of bias if it met four, five or six criteria, and a high risk of bias if it met three criteria or fewer [24]. The EPOC criteria were not developed to assess the methodological quality of study designs other than RCTs, CCTs, CBAs and ITS. Other designs, such as pre-experimental post-test only designs, were judged as having a high risk of bias, as these generally have low evidence strength when studying the effects of interventions.

### **2.2.4. Data analysis and synthesis**

The first two authors (JD and SG) extracted data from the publications included and entered the data onto digital structured data-extraction forms; the last author (MK) checked the extracted data. Disagreements were resolved by discussion between the review authors. Data were extracted about the

country, model of nurse prescribing, prescribers, patients, number of medicines prescribed, types of medicines prescribed and various patient outcomes. All data extracted from the studies were based on the results sections and not on the study conclusions. Outcomes were classified according to the research questions and grouped together into effects on the medication prescribed and effects on patient outcomes..

#### *2.2.4.1. Pooling*

The option of pooling published effect sizes was considered if studies reported similar outcomes, presented raw data and reported outcomes that were either all continuous or all dichotomous. Standardised mean differences and a random effects model were used for continuous outcomes, while relative risks and a random effects model were used for dichotomous outcomes. Confidence intervals were set at 95% [42]. The decision to pool studies was based on their clinical homogeneity, defined as similarity in the care setting and in the type of illness affecting the patients included in the study. Furthermore, the results of pooling are only reported if the pooled studies show acceptable statistical homogeneity. Studies were considered to be statistically homogenous if the chi-square test value was less than the degrees of freedom, the P value was above 0.1 and the inconsistency test  $I^2$  was less than 50% [42,43].

#### *2.2.4.2. Subgroup analysis*

If data permitted, we planned to conduct subgroup analyses for different countries, nurse prescribers and models of nurse prescribing. However, due to substantial statistical heterogeneity between studies, this was only possible for countries.

#### *2.2.4.3. Sensitivity analysis*

The intention was to conduct a sensitivity analysis on the basis of study quality. However, as almost all studies included had a high risk of bias, no sensitivity analysis was performed.

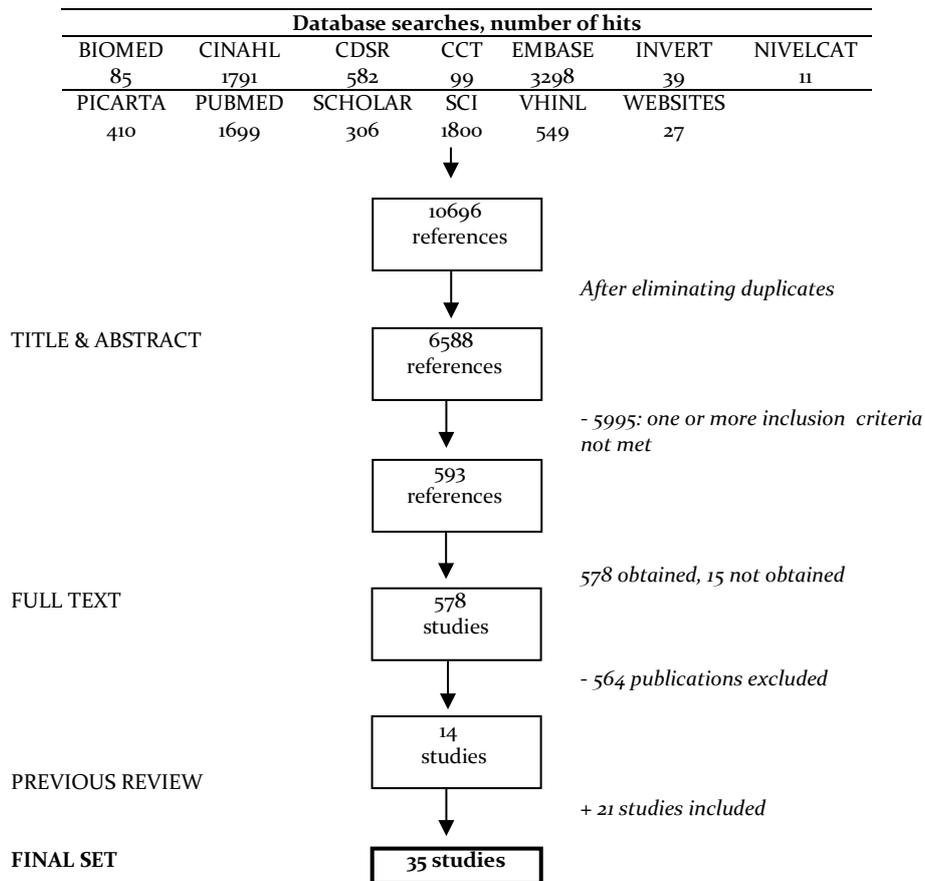
### **2.3. Results**

#### ***2.3.1. Search and inclusion results***

After duplicates had been removed, the searches in the different databases resulted in an initial set of 6588 references of potential interest. Initial sifting

based on title and abstract reduced this set to 593 references. As said, a 10% sample of all references was initially studied independently by two reviewers (JD and SG), looking at the title and abstract. These reviewers had good/moderate agreement (Cohen's Kappa = 0.76), and the remaining 90% of the sample was therefore divided between them. Full-text copies were ordered of the resulting set of 593 studies for the second stage of the inclusion process; 578 copies were actually obtained. Two reviewers (JD and SG) independently performed the second selection phase and 14 studies were deemed eligible for inclusion. Additionally, the two reviewers checked all studies included in the previous review for eligibility in this review and included 21 of them. Finally, 35 studies were selected for the next stage of the review, for data-extraction and analysis. Figure 2.1 shows the flow diagram of the inclusion process.

Figure 2.1 Flow diagram of the inclusion process



### **2.3.2. Methodological quality of the final 35 studies**

Only ten of the 35 studies included were randomised controlled trials [44-53], and one was a Controlled Clinical Trial [54]. The methodological quality of these eleven studies using a randomised or non-randomised controlled design was assessed using the EPOC criteria for RCTs and CCTs. Three studies had a low risk of bias [47,48,51], two studies had a moderate risk of bias [45,53] and the remaining RCTs and the CCT had a high risk of bias [44,46,49,50,52,54]. The remaining 24 studies either had a pre-test post-test design without a comparison group or a pre-experimental post-test only design. As these designs generally have low evidence strength when studying the effects of interventions, they were all rated as having a high risk of bias.

### **2.3.3. Characteristics of the final 35 studies**

#### *2.3.3.1. Date and geographical focus of studies*

The publication years of the selected studies varied from 1974 to 2011. Thirteen of the 35 studies were conducted in the USA, twelve in the UK, five in the Netherlands, two in Canada, two in Norway and one in Colombia.

#### *2.3.3.2. Nurse prescribing models studied*

Twenty-two of the 35 studies involved independent nurse prescribing, two studies involved supplementary nurse prescribing, five studies described a mix of independent and supplementary prescribing, and six studies looked at prescribing based on group directions.

#### *2.3.3.3. Care setting*

Twenty-three studies were conducted in primary care [44,49-70], eleven studies were conducted in secondary care [45-47,71-78] and one study was conducted in both primary and secondary care [48].

#### *2.3.3.4. Patients of interest in the studies*

Some of the studies involved nurse prescribing for several or mixed patient populations, while others were restricted to nurse prescribing for specified patient groups only (e.g. patients with diabetes, mental health patients or patients with acute minor illnesses). Eleven studies involved nurse prescribing for various groups of patients [48-50,52,54,55,58,59,62,67,70]. Seven studies focused on nurse prescribing for patients with diabetes [45,46,51,53,65,74,79], four studies studied nurse prescribing for (cardiology) patients with

hypertension [51,65,77,78], four studies were carried out in the field of mental health care [71-73,76], three studies included patients with sore throats or upper respiratory throat infections [56,57,60], three studies involved nurses prescribing birth control pills [44,66,68], one study included children with moderate asthma [48], one study focused on nurse prescribing for the medical management of constipation [64], one study focused on patients with acute minor illnesses [61], one study included all patient encounters resulting in a diagnosis of (streptococcal) pharyngitis or sore throat [69], and finally there was one study in a radiotherapy and oncology department that involved patients with diagnoses that included acute radiation toxicity causing proctitis from pelvic radiotherapy and erythema of the scalp due to cranial irradiation [75].

#### **2.3.4. *Effects on medication prescribed***

All results discussed in the following sections were statistically significant at  $P < 0.05$  unless otherwise indicated.

##### **2.3.4.1 *Total amount of medication prescribed***

Studies comparing the total amount of medication prescribed by nurses and doctors show mixed results. As most studies found divergent results for different types of medicines, it is difficult to determine whether nurses prescribe less, more or the same amount of medication compared to doctors (see Table 2.1).

Table 2.1 Total amount of medication prescribed by nurses compared with physicians

Study	Country	Patient group	Total amount of medication prescribed by nurses as compared to physicians		
			Less	Same	More
Houweling <i>et al.</i> 2009	Netherlands	Diabetes	X <sup>1</sup>		
Fletcher <i>et al.</i> (2011)	USA	Hypertension/ diabetes	X <sup>2</sup>	X	
Fisher & Vaughan-Cole (2003)	USA	Schizophrenia or depression		X	
Houweling <i>et al.</i> (2005a)	Netherlands	Diabetes	X <sup>1</sup>	X	
Ferguson <i>et al.</i> (1998)	UK	Various		X	
Sandø <i>et al.</i> (2010)	Norway	Patients who received oral contraceptives		X	
Cipher <i>et al.</i> (2006)	USA	Various		X	X <sup>3</sup>
Running <i>et al.</i> (2006)	USA	Various	X <sup>4</sup>	X	X <sup>5</sup>
Jacobs (2005)	USA	Depression, dysthymia or bipolar II disorders	unclear		

<sup>1</sup> For cholesterol-lowering agents

<sup>2</sup> For cardiovascular agents

<sup>3</sup> In non-metropolitan areas

<sup>4</sup> For bronchodilators

<sup>5</sup> For decongestants for bronchitis

Only three of the nine studies reporting on the total amount of medication prescribed found unambiguous results [47,58,68]. Ferguson *et al.* (1998) concluded that the increase in the volume of prescribing following the introduction of nurse prescribing in the UK was similar to the national increase in the volume of prescribing for the same period. Sandø *et al.* (2010) found that GPs and nurses prescribed equal numbers of initial prescriptions of the birth control pill. Houweling *et al.* (2009) found that nurses prescribed less cholesterol-lowering medication than medical specialists. Other studies found mixed results depending on therapy type and/or the type of medication being prescribed.

While Houweling *et al.* (2005a) found that specialist nurses and medical specialists prescribed the same amount of glucose and blood pressure lowering medication, specialised nurses prescribed less cholesterol-lowering medication [46]. Fletcher *et al.* (2011) concluded that there were no significant differences between nurses and physicians in the prescription of hypoglycaemic medication for patients with hypertension and/or diabetes, but patients were less likely to be prescribed cardiovascular agents if they had a nurse as their primary care provider [65]. Fisher & Vaughan-Cole (2003) found that psychiatrists and advanced practice registered nurses (APRNs) prescribed similar overall quantities of medication except for benzodiazepines, where prescriptions by psychiatrists were more than double the volume prescribed by APRNs. However, the significance of this finding remains unclear [72].

Running *et al.* (2006) found conflicting results. On the one hand, nurses prescribed more over-the-counter (OTC) decongestants for patients with bronchitis than physicians did, but on the other hand, they prescribed fewer bronchodilators [67]. In 2005, Jacobs also found conflicting results, without reporting significance levels though [73]. This study found that nurses prescribed fewer mood stabilizers, fewer secondary anti-depressants and less new-age antipsychotic medication than psychiatrists. However, where split therapy was concerned, i.e. where patients see a clinician for psychotherapy and another healthcare professional for medication management, the prescription of benzodiazepine anti-anxiety agents was slightly higher for patients who received their prescriptions from psychiatric nurses (20%) than for patients who received their prescriptions from psychiatrists (15%). For other types of therapies, prescriptions of mood stabilisers and secondary anti-depressants by psychiatric nurses were similar to those by psychiatrists [73]. Finally, CIPHER *et al.* (2006) found conflicting results in their study as well, but these stemmed from a different source, namely geographical area. In metropolitan areas, there was no difference in the average volume of medication prescribed between nurses and physicians. In non-metropolitan areas however, the average number of prescriptions was greater for nurses [63].

#### 2.3.4.2 *Number of patients prescribed medication*

Eleven out of fifteen studies on the number of patients prescribed medication report that the number of patients for whom a nurse prescribes medication is

similar to the number of patients for whom a physician prescribes medication. Two studies show nurses prescribing medication for a higher percentage of patients than physicians do and one study found nurses prescribing for a lower number of patients (see Table 2.2).

Table 2.2 Number of patients prescribed medication by nurses versus physicians

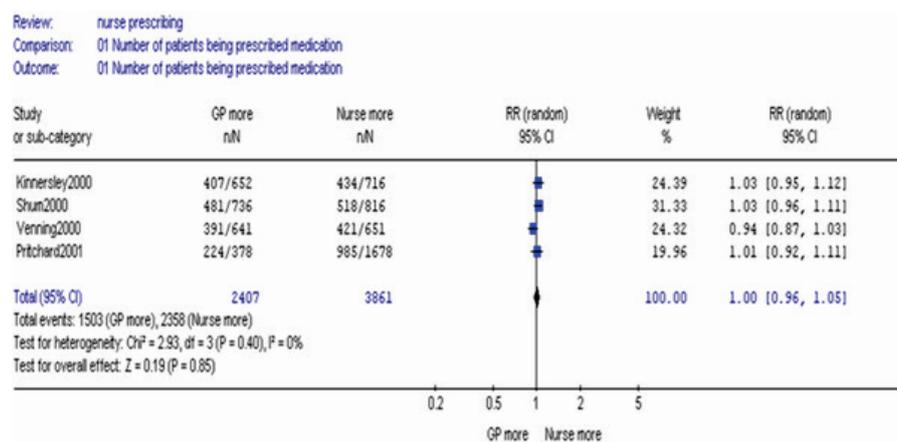
Study	Country	Patient group	Number of patients prescribed by nurse as compared to physician psychiatrist		
			Fewer	Same	More
Butler <i>et al.</i> (2001)	UK	URTI	X		
Cipher <i>et al.</i> (2006)	USA	Various		X	
Cox & Jones (2000)	UK	Sore throats		X	
Feldman <i>et al.</i> (2003)	USA	Mental health patients		X	
Jones <i>et al.</i> (2011)	UK	Hypertension/renal problems		X	
Kinnersley <i>et al.</i> (2000)	UK	Various		X	
Kuethe <i>et al.</i> (2011)	Netherlands	Asthma (children)		X	
Ladd (2005)	USA	URTI		X	
Pritchard & Kendrick (2001)	UK	Acute minor illnesses		X	
Shum <i>et al.</i> (2000)	UK	Various		X	
Venning <i>et al.</i> (2000)	UK	Various		X	
Hooker & Cipher (2005)	USA	Various		X	X <sup>1</sup>
Roumie <i>et al.</i> (2005)	USA	Various			X
Batey & Holland (1985)	USA	Various	unclear		
Hansen & Skjeldestad (2007)	Norway	Women using oral contraceptives (OCs)	unclear		

<sup>1</sup> Only in rural areas

Most studies found no differences between nurses and doctors regarding the number of patients who were prescribed medication, including prescriptions for antibiotics, antidepressants, inhaled corticosteroids and medication for hypertension [48,49,52,54,57,60,61,63,71,78].

Two studies conducted in primary care found that nurses prescribed medication for fewer patients than physicians did [55,56]. However, Batey & Holland (1985) do not report whether this difference is statistically significant. Hooker & Cipher (2005) found no difference in the overall number of patients receiving prescriptions, but when rural areas alone were taken into consideration, they found that nurse practitioners prescribed medication for significantly more patients than physicians did. Three studies conducted in primary care also found that nurses prescribed medication for more patients, but Hansen & Skjeldestad (2007) do not report significance levels [59,62,66]. The pooling of studies that reported outcomes on the number of patients being prescribed medication was considered for six studies that all reported raw dichotomous data and were conducted in a primary care setting with various patients. However, it was decided that pooling these studies was not justified due to substantial statistical heterogeneity. But a subgroup analysis based on pooling the country data was possible: four studies from the UK taken together showed no difference in the number of patients being prescribed medication by nurses as compared with GPs (Figure 2.2) [49,52,54,61].

Figure 2.2 Number of patients being prescribed medication in primary care in the UK



### 2.3.4.3 Number of medicines prescribed per patient visit

Four studies reported on the number of medicines prescribed per patient visit. Two studies concluded that the mean number of medicines prescribed per

patient visit was similar for physicians and nurse practitioners [59,63]. Jones *et al.* (2011) found no difference between nurses and doctors in the number of medicines prescribed per patient [78], while another study found that the average number of medicines used by patients per medicine visit was 1.33 for nurses and 1.87 for physicians, but the statistical significance of this finding was not reported [55].

#### 2.3.4.4 *Type of medication and dose prescribed*

There were few overall differences between nurses and doctors in the type and dose of medication prescribed. Jones *et al.* (2011) reported no statistically significant differences between nurse and doctor prescribers in the types of items prescribed per patient [78]. Kuethe *et al.* (2011) found that the corrected daily dose of inhaled corticosteroids prescribed for children with asthma was the same for specialised asthma nurses as for GPs and paediatricians [48]. Running *et al.* (2006) reported that the most common pharmacotherapeutic treatments prescribed by nurses and physicians for patients with musculoskeletal injuries and back pain were non-steroidal anti-inflammatory drugs and muscle relaxants. Nurses appeared to use more nonpharmacological interventions in addition, but these differences were not statistically significant [67]. In mental health care, both psychiatric nurses and psychiatrists primarily prescribed SSRI anti-depressant medicines, but psychiatrists prescribed more other types of antidepressant medication as well [71,72]. Finally, the study by Einhorn & Trias (1978) on contraceptives notes that while the number of patients receiving intrauterine devices (IUDs) on a second visit was similar for nurses and physicians, nurses were initially more likely to keep clients on conventional methods such as contraceptive foam and condoms [44].

Sandø *et al.* 2010 found a difference in prescribing practices between nurses and GPs, and noted that GPs were more likely than nurses to prescribe a birth control pill of the third generation [68]. Davis & Drennan (2007) likewise concluded that prescribing patterns differed between nurses and GPs, as nearly three-quarters of the prescriptions by nurses for constipation favoured items from the osmotic class of laxatives, compared to only 36% of GP prescriptions [64].

### **2.3.5. Effects on patient outcomes**

#### **2.3.5.1 Clinical outcomes**

Most of the 13 studies reporting on clinical outcomes found no differences between nurse prescribing and physician prescribing in this regard (see Table 2.3). There were no significant differences found between patients receiving prescriptions from a nurse and those receiving prescriptions from a physician in HbA<sub>1c</sub>, blood pressure and creatinine level [65]; in airway responsiveness, asthma control and number of severe exacerbations [48]; in systolic blood pressure, urine albumin status and incidence of adverse events [51]; in the number of sore throats that had settled [57]; in the resolution of symptoms and concerns [54]; in patients' rating of their health status or in terms of clinical improvement after two weeks [49]; in health status outcome [52]; in the physical status level, emotional and social function, and crude death rates [50]; and in pregnancy rates, method continuation and side effects for contraceptive services [44]. Moreover, Houweling *et al.* conducted several studies in the field of diabetes care and found no significant differences in outcomes for HbA<sub>1c</sub>, blood pressure, total cholesterol, cholesterol/HDL ratio, lipid profile, quitting smoking rates, percentage of patients within the target values for body mass index (BMI) and quality of life and diabetes-related symptoms [45,47,53].

Some differences, however, were also reported. Cox & Jones (2000) found that patients' perception of being back to normal health and the median number of days for sore throats to settle were more favourable for nurses than GPs [57]. In another study, patients with hypertension and diabetes receiving prescriptions from nurses had a significantly larger drop in diastolic blood pressure than patients receiving prescriptions from physicians [51]. Houweling *et al.* found divergent results for cholesterol/HDL ratios in diabetes patients: in one study, the cholesterol/HDL ratio improved more for patients being treated by a medical specialist [45], while in another study it improved more for patients being treated by a nurse specialised in diabetes [47].

Table 2.3 Clinical outcomes of patients receiving prescriptions from nurses versus physicians

Study	Country	Type of patient	Clinical outcomes		
			Better outcomes for nurses	No difference	Better outcomes for physicians
Tobe <i>et al.</i> (2006)	Canada	Diabetes and Hypertension	X <sup>1</sup>	X	
Cox & Jones (2000)	UK	Sore throats	X <sup>2</sup>	X <sup>3</sup>	
Einhorn & Trias (1978)	Colombia	Women seeking contraceptives		X	
Fletcher <i>et al.</i> (2011)	USA	Diabetes and/or hypertension		X	
Houweling <i>et al.</i> (2005c)	Netherlands	Diabetes		X	
Kinnersley <i>et al.</i> (2000)	UK	Various		X	
Kuethel <i>et al.</i> (2011)	Netherlands	Asthma (children)		X	
Shum <i>et al.</i> (2000)	UK	Various		X	
Spitzer <i>et al.</i> (1974)	Canada	Various		X	
Venning <i>et al.</i> (2000)	UK	Various		X	
Houweling <i>et al.</i> (2005b)	Netherlands	Diabetes		X	X <sup>4</sup>
Houweling <i>et al.</i> (2009)	Netherlands	Diabetes		X	X <sup>4</sup>
James (2004)	UK	Diabetes	unclear		

<sup>1</sup> For diastolic blood pressure

<sup>2</sup> For perception of being back to normal health and number of days for sore throat to settle

<sup>3</sup> For number of patients whose sore throats had settled

<sup>4</sup> For cholesterol/HDL ratio

### 2.3.5.2 Satisfaction with care

Patients were generally more satisfied or equally satisfied with the care provided by a nurse compared to traditional care provided by a physician. Only one study found that patients treated by a nurse were less satisfied with the care provided than patients cared for by a physician (see Table 2.4).

Table 2.4 Patients' satisfaction with care provided by nurses versus physicians

Study	Country	Patient group	Patient satisfaction with care provided by nurses versus physicians		
			Less	Same	Greater
Williams <i>et al.</i> (2009)	USA	Mental illness	X		
Kinnersley <i>et al.</i> (2000)	UK	Various		X	X <sup>1</sup>
Cox & Jones (2000)	UK	Sore throats		X	
Foreman & Morton (2011)	UK	ADHD		X	
Pritchard & Kendrick (2001)	UK	Various		X	
Spitzer <i>et al.</i> (1974)	Canada	Various		X	
Gambino <i>et al.</i> (2009)	USA	Cardiology & rehabilitation			X
Houweling <i>et al.</i> (2005b)	Netherlands	Diabetes			X
Houweling <i>et al.</i> (2005c)	Netherlands	Diabetes			X
Houweling <i>et al.</i> (2009)	Netherlands	Diabetes			X
Jones <i>et al.</i> (2011)	UK	Hypertension and/or renal			X
Shum <i>et al.</i> (2000)	UK	Various			X
Venning <i>et al.</i> (2000)	UK	Various			X

<sup>1</sup>Children are more satisfied

Seven studies found that patients were more satisfied with care received from nurses than with care received from GPs or physicians [45,47,49,52,53,77,78]. Moreover, Kinnersley *et al.* (2000) found that children were more satisfied with care received from nurses, but adult patients did not have a preference [54]. Four other studies found that patients' satisfaction with the care received was similar for nurses and doctors [50,57,61,76]. Williams *et al.* (2009), however, found that patients served by a nurse practitioner reported lower levels of satisfaction than patients served by a psychiatrist. However, the roles of the two categories of prescribers in this study were not comparable, so no substantive conclusions can be drawn from these findings [70].

### 2.3.5.3 *Quality of care*

Two studies concluded that the quality of care provided by nurses was similar to or better than the quality of care provided by GPs. Spitzer *et al.* (1974) found no significant differences between nurses and GPs in the quality of care, measured on the basis of ten indicators of care management that were developed by a group of physicians [50], while Houweling *et al.* (2005c) showed that all process indicators for the quality of care were higher for nurses than for physicians, except for two indicators for which there was no difference [53].

### 2.3.5.4 *Consultation time*

Six of the eight studies reporting on consultation times found that nurses generally spent more time with patients than doctors, while the remaining two studies found no difference. In the USA, two studies reported that psychiatric nurses in secondary mental health care spent more time with patients than psychiatrists during medication visits [72,73], although Jacobs (2005) does not report the statistical significance of this finding. Three studies concluded that nurses had longer consultation times than GPs in general practice in the UK [49,52,54], and a study in primary diabetes health care in the Netherlands also found that the total duration of the consultations per patient was higher for the practice nurse than for the physicians [53]. However, in the case of secondary diabetes health care, no differences were found in the total duration of all consultations [46,47].

### 2.3.5.5 *Provision of information*

Five studies reported that nurses gave more or the same amount of information to patients as doctors. Nurses were found to give more advice about home remedies for sore throats than GPs [57], and more advice on self-medication and general self-management [49]. Sandø *et al.* (2010) reported that significantly more nurses than physicians said that they informed patients about contraceptive security and the risk of arterial thromboembolic disease, and offered follow-up when prescribing OCs for first time [68]. In the study by Kinnersley *et al.* (2000), patients managed by nurse practitioners (NPs) reported receiving significantly more information about their illnesses [54]. Finally, Running *et al.* (2006) concluded that NPs and physicians gave similar amounts of smoking cessation information to patients [67].

#### 2.3.5.6. Investigations

One study in primary care found that that nurse practitioners were more likely to order tests and investigations than GPs [52], while another study found that GPs initiated more investigations for acute minor illnesses compared to practice nurses [61]. Kinnersley *et al.* (2000) found no difference between nurse practitioners and GPs in the number of investigations ordered [54].

#### 2.3.5.7 Referrals

Three studies in primary care reported no differences between nurses and GPs in the number of referrals to secondary care [52,54,61]. Two studies of patients with diabetes in secondary care, however, found that patients cared for by specialised nurses were more likely to be referred back to their GP to continue their treatment in the GP practice compared to patients cared for by medical specialists [45,47].

#### 2.3.5.8 Follow-up consultations

In general, patients cared for by nurses make more return visits than patients cared for by doctors. Venning *et al.* (2000) found that patients treated by nurses were more likely to make return visits to the clinic than patients cared for by GPs [52]. A study of contraceptive services showed that nurses have significantly more scheduled revisits [44], while Kuethe *et al.* (2011) reported that children cared for by nurses had more regular follow-up visits up than children cared for by GPs or paediatricians [48]. Fletcher *et al.* (2011) showed that the mean number of primary and specialty care visits did not vary by care provider type, but the average number of psychiatric care outpatient visits was significantly lower for nurse practitioners' patients compared with physicians' patients [65].

Four studies in primary care found no difference between patients cared for by nurses and patients cared for by GPs in the number of follow-up consultations [54,56,57,61]. Only two of the eight studies reporting on follow-up consultations could be pooled with regard to the number of follow-up consultations [56,57]. The studies show no significant effect when taken separately, but when pooled, they show that nurses have slightly more follow-up consultations than GPs. However, the rate of follow-up consultations is low (between 6% –10%) for both GPs and nurses, and the effect size found is small (1.68, confidence level 1.04 –2.73).

#### 2.3.5.9 *Medication adherence*

Only one study reported on medication adherence; it found no significant difference between treatment by a psychiatrist and treatment by an advanced practice registered nurse [73].

#### 2.3.5.10 *Patient enablement*

Two studies report that patient enablement, i.e. the extent to which patients understand their illness and are able to cope with it, is similar for nurse practitioners and GPs [52,61].

## 2.4. Discussion

This review has identified and mapped quantitative studies exploring the effects of nurse prescribing on medication and patient outcomes. Our results support the findings of the previous review [6]. Our findings suggest that nurses prescribe for a wide range of patients and in comparable ways to physicians. Overall, nurses appear to prescribe for just as many patients as physicians do, nurses prescribe comparable numbers of medicines per patient visit and there appear to be few differences between nurses and physicians in the type and dose of medication prescribed and in clinical outcomes. Studies comparing the total number of medicines prescribed by nurses and doctors show mixed results though, depending on therapy type and the type of medication being prescribed. Patients were generally more or equally satisfied with the care provided by nurses compared to the traditional care provided by physicians. Moreover, nurses generally appear to spend more time with patients than physicians do and to give more or the same amount of information to patients. Results concerning differences in the number of investigations by nurses and physicians are mixed. While there appear to be no differences between nurses and physicians in referrals to secondary care, patients cared for by nurses seem to make more return visits than patients cared for by physicians. Based on these results, it appears that nurse prescribing is of similar quality to physician prescribing, and worries about whether nurses have the competence to prescribe appear to be unfounded.

#### ***2.4.1 Strengths and weaknesses of the review***

The main strength of this review is that it reviews the effects of nurse prescribing on medication and patient outcomes when compared to physician prescribing. The strength of the studies included stems from their real-world setting, with clinically typical, routinely managed patients, and the direct examination of clinically relevant outcomes. Moreover, the datasets of most studies were sufficiently large to explore the phenomenon of interest in this systematic review.

While our findings suggest that nurses prescribe in comparable ways to physicians, the findings should be understood in the context of some limitations. Due to methodological limitations in the studies included, conclusions about the effects of nurse prescribing on medication and patient outcomes remain tentative. We included 35 studies, 24 of which were of low methodological quality owing to their study design, i.e. they were not RCTs or CCTs. Of the eleven RCTs and CCTs included in the review, three had a low risk of bias, two had a moderate risk of bias and six had a high risk of bias. Therefore, only tentative conclusions can be drawn about the effects of nurse prescribing on medication and patient outcomes. Yet it should be noted that the overall general findings as outlined above, indicating that nurses prescribe in similar ways to doctors, are in line with the findings of the five studies that had a moderate to high methodological quality.

Furthermore, our results should be interpreted with caution since a number of other factors may have influenced our results. After all, nurse prescribing is embedded in other tasks such as consultation, diagnosis and treatment. It is difficult to distinguish the effects of nurse prescribing from these other tasks and determine, for example, whether patients are more satisfied with nurse prescribing because of their prescribing practices or because nurses have more time for patients. One possible solution to this problem would be to further elucidate the factors that lead to greater patient satisfaction [80].

Finally, it should be noted that comparisons between nurses and physicians in the quantity and type of medication prescribed cannot be directly linked to clinical outcomes or effects on patients. Where nurses and physicians prescribe in similar ways, such as the prescription of antibiotics for patients with upper respiratory tract infections, this is usually considered a good thing. However, the prescription of antibiotics is not appropriate for viral upper respiratory tract infections and hence both nurses and physicians, although prescribing in similar ways, are exhibiting suboptimal prescription behaviour

in that case [60]. In general, however, nurses appear to prescribe clinically appropriate medication [81-83]. Moreover, while doctors and nurses within one country will usually prescribe from the same national protocols or guidelines, it is possible that where professionally tailored protocols or guidelines have been developed, comparisons between doctors and nurses in quantity of medicines may be hampered by differences in directions in the protocols and guidelines that are used.

#### **2.4.2 Directions for future research**

Future research should preferably employ a randomised controlled design in order to determine the effects of nurse prescribing when compared to physician prescribing on the quantity and types of medication prescribed and on patient outcomes. Moreover, further research is needed in order to address issues that have received less attention in the literature so far, including the effects of nurse prescribing on the quality of care, provision of information, investigations and referrals, and medication adherence.

### **2.5. Conclusion**

Nurses prescribe in comparable ways to physicians and the effects of nurse prescribing on medication and patient outcomes are similar or better when compared to physician prescribing. However, due to methodological weaknesses in this body of research, conclusions must remain tentative. More randomised controlled designs in the field of nurse prescribing are required to enable definitive conclusions about the effects of nurse prescribing.

### **Acknowledgements**

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## Additional file 2.1 Search strategies

### Databases

Search strategy BIOMED Central dd. 05-01-2012

Search ID#	Search Terms
S1	Nurs* AND prescri* in citation and abstract from 2006 to 2011

85 references were included in the original literature list.

Search strategy CINAHL dd. 05-01-2012

Search ID#	Search Terms	Search Options
S1	Nurse prescribing	Boolean/Phrase
S2	(TI nurs* OR AB nurs*) AND (TI prescri* OR AB prescri*)	Boolean/Phrase
S3	(TI nurs* OR AB nurs*) AND (MH "Prescriptions, Drug")	Boolean/Phrase
S4	#S1 OR #S2 OR #S3	Boolean/Phrase

1791 references were included in the original literature list.

Search strategy Cochrane Library dd. 05-01-2012

Search ID#	Search query
S1	nurs* in Record Title or nurs* in Abstract, from 2006 to 2011 in Cochrane Database of Systematic Reviews
S2	prescri* in Record Title or prescri* in Abstract, from 2006 to 2011 in Cochrane Database of Systematic Reviews
S3	"prescriptions, drugs" in Keywords, from 2006 to 2011 in Cochrane Database of Systematic Reviews
S4	"nurse prescribing", from 2006 to 2011 in Cochrane Database of Systematic Reviews
S5	(#1 AND #2), from 2006 to 2011 in Cochrane Database of Systematic Reviews"
S6	(#1 AND #3), from 2006 to 2011 in Cochrane Database of Systematic Reviews
S7	(#4 OR #5 OR #6), from 2006 to 2011 in Cochrane Database of Systematic Reviews

582 references were included in the original literature list.

Search strategy Current Controlled Trials- International Standard Randomised Controlled Trial Number Register dd. 05-01-2012

Search ID#	Search Terms
#1	"nurse prescribing"
#2	Nurse AND prescribing
#3	Nurse*
#4	Prescri*
#5	Prescri* AND nurse*

64 references were included in the original literature list.

Search strategy Current Controlled Trials- International Standard Randomised Controlled Trial Number Register dd. 05-01-2012

Search ID#	Search Terms
#1	"nurse prescribing"
#2	Nurse AND prescribing

35 references were included in the original literature list.

Search strategy EMBASE dd. 05-01-2012

No.	Search query
1	nurs*:ti OR nurs*:ab AND [2006-2011]/py
2	prescri*:ti OR prescri*:ab AND [1-1-2006]/sd NOT [31-12-2011]/sd AND [2006-2011]/py
3	#1 AND #2
4	'nurse'/exp OR 'nurse' AND prescribing AND [2006-2011]/py
5	#3 OR #4

3298 references were included in the original literature list.

Search strategy INVERT Catalogue dd. 05-01-2012

No.	Search query
1	Titelwoorden verpleging OF titelwoorden verpleegks EN titelwoorden voorschrijfs
2	Titelwoorden nurs\$ EN titelwoorden prescri\$
3	Trefwoorden verpleegkundigen EN titelwoorden voorschrijfs
4	Trefwoorden verpleegsters en verplegers EN titelwoorden voorschrijfs
5	Trefwoorden verpleging EN titelwoorden voorschrijfs
6	Trefwoorden verpleegkundig specialisten EN titelwoorden voorschrijfs

39 references were included in the original literature list.

Search strategy NIVEL Catalogue dd. 05-01-2012

No.	Search query
1	(Trefwoord: verpleging (inclusief alle specifiekere termen)) OF (Trefwoord: verpleegkundigen (inclusief alle specifiekere termen)) OF (Trefwoorden: praktijkverpleegkundigen) EN (Trefwoord: voorschrijven)

11 references were included in the original literature list.

Search strategy PICARTA for articles dd. 05-01-2012

No.	Search query
1	Alle woorden: verpleging OF verpleegk*
2	Alle woorden: voorschrij*
3	S1 en s2
4	Alle woorden: nurs*
5	Alle woorden: prescri*
6	S4 en S5
7	Alle woorden: "nurse prescribing"
8	S3 of S6

407 references were included in the original literature list.

Search strategy PICARTA for books dd. 05-01-2012

<b>No.</b>	<b>Search query</b>
1	Alle woorden: verpleging OF verpleegk*
2	Alle woorden: voorschrij*
3	S1 en s2
4	Alle woorden: nurs*
5	Alle woorden: prescri*
6	S4 en S5
7	Alle woorden: "nurse prescribing"
8	S3 of S6

3 references were included in the original literature list.

Search strategy PubMed dd. 05-01-2012

<b>Search</b>	<b>Search query</b>
#1	Search "Nurse prescribing" OR (Nurse* [tiab] AND Prescri* [tiab]) OR (Nurs* AND drug prescriptions [MeSH]) AND ( ( "2006/01/01"[PDat] : "2011/12/31"[PDat] ) )

1699 references were included in the original literature list.

Search strategy Science Citation Index dd. 05-01-2012

<b>No.</b>	<b>Search query</b>
1	TS=nurs* AND TS=prescri*
2	TS=(nurse prescribing)
3	(TS=nurs* AND TS=prescri*) OR (TS=(nurse prescribing))

1800 references were included in the original literature list.

Search strategy Virginia Henderson Library dd. 05-01-2012

<b>No.</b>	<b>Search query</b>
1	Nurse AND prescri* in abstract, published between 2006 and 2011

549 references were included in the original literature list.

Total result of literature searches in databases: 10243 references.

## Websites

<b>Name, link and date searched</b>	<b>Search strategy</b>
Escriber.com <a href="http://www.escriber.com/view/o/index.html">http://www.escriber.com/view/o/index.html</a> 28-06-2012	Website was searched using basic search facilities. Search term: "nurse prescribing"
Google Scholar <a href="http://scholar.google.nl/">http://scholar.google.nl/</a> 28-06-2012	Website searched for PDFs with abstract using basic search facilities. Search term: "nurse prescribing".
UK Department of Health <a href="https://www.gov.uk/government/organisations/department-of-health">https://www.gov.uk/government/organisations/department-of-health</a> 28-06-2012	Website was searched using basic search facilities. Search term: "nurse prescribing"
World Health Organisation <a href="http://www.who.int/en/">http://www.who.int/en/</a> 28-06-2012	Website was searched using basic search facilities. Search term: "nurse prescribing"

Total result of literature searches in websites: 333 references.

Literature searches in databases: N= 10363 references  
Literature searches in websites: N= 333 references  
**Total result literature searches: N = 10696 references**

# 3

## **Nurse prescribing of medicines in Western European and Anglo-Saxon countries: a systematic review of the literature**

Published as:

Kroezen M, Van Dijk L, Groenewegen PP, Francke AL: Nurse prescribing of medicines in Western European and Anglo-Saxon countries: a systematic review of the literature. *BMC Health Services Research* 2011, 11(1), 127.

## **Abstract**

### **Background**

A growing number of countries are introducing some form of nurse prescribing. However, international reviews concerning nurse prescribing are scarce and lack a systematic and theoretical approach. The aim of this review was twofold: firstly, to gain insight into the scientific and professional literature describing the extent to and the ways in which nurse prescribing has been realised or is being introduced in Western European and Anglo-Saxon countries; secondly, to identify possible mechanisms underlying the introduction and organisation of nurse prescribing on the basis of Abbott's theory on the division of professional labor.

### **Methods**

A comprehensive search of six literature databases and seven websites was performed without any limitation as to date of publication, language or country. Additionally, experts in the field of nurse prescribing were consulted. A three stage inclusion process, consisting of initial sifting, more detailed selection and checking full-text publications, was performed independently by pairs of reviewers. Data were synthesized using narrative and tabular methods.

### **Results**

One hundred and twenty-four publications met the inclusion criteria. So far, seven Western European and Anglo-Saxon countries have implemented nurse prescribing of medicines, viz., Australia, Canada, Ireland, New Zealand, Sweden, the UK and the USA. The Netherlands and Spain are in the process of introducing nurse prescribing. A diversity of external and internal forces has led to the introduction of nurse prescribing internationally. The legal, educational and organizational conditions under which nurses prescribe medicines vary considerably between countries; from situations where nurses prescribe independently to situations in which prescribing by nurses is only allowed under strict conditions and supervision of physicians.

### **Conclusions**

Differences between countries are reflected in the jurisdictional settlements between the nursing and medical professions concerning prescribing. In some countries, nurses share (full) jurisdiction with the medical profession, whereas

in other countries nurses prescribe in a subordinate position. In most countries the jurisdiction over prescribing remains predominantly with the medical profession. There seems to be a mechanism linking the jurisdictional settlements between professions with the forces that led to the introduction of nurse prescribing. Forces focussing on efficiency appear to lead to more extensive prescribing rights.

### 3.1. Background

The number of countries where nurses are legally permitted to prescribe medication has grown considerably over the last two decades [1,2]. However, even though the term ‘nurse prescribing’ suffices as descriptor term, the actual practice it refers to varies considerably, both within countries and internationally [3]. Still, international comparisons with regard to nurse prescribing are scarce and those reviews that make an international comparison either focus on the effects of nurse prescribing [4], or lack a clear theoretical and systematic approach [5,6]. A comparative review of the extent of, and the ways in which nurse prescribing has been realised or is being initiated internationally, supported by a sound theoretical model, is lacking. The way in which prescribing by nurses is organized has far-reaching implications, both for the allocation of jurisdictional control over prescriptive authority and for the potential success of nurse prescribing in daily practice. Theoretical insights can help to shed light on these relationships. We therefore set out an international systematic review of publications dealing with the implementation process of nurse prescribing and current nurse prescribing practices within Western European and Anglo-Saxon countries. The theoretical framework used in the review is based on Andrew Abbott’s theory on the division of expert labor in modern societies [7].

Traditionally, the task of prescribing medicines has been the domain of the medical profession [8,9], but the development of nurse prescribing represents an incursion on the medical profession’s jurisdiction over prescribing. According to Abbott [7], jurisdiction – ‘the link between a profession and its work’ – forms the central phenomenon of professional life. Since one profession can pre-empt another’s jurisdiction or control over a task, professions exist in an interdependent system with competing jurisdictional claims. These claims can be made in several arenas, i.e. professions can claim control over tasks in the legal arena, the workplace and in the arena of public opinion.

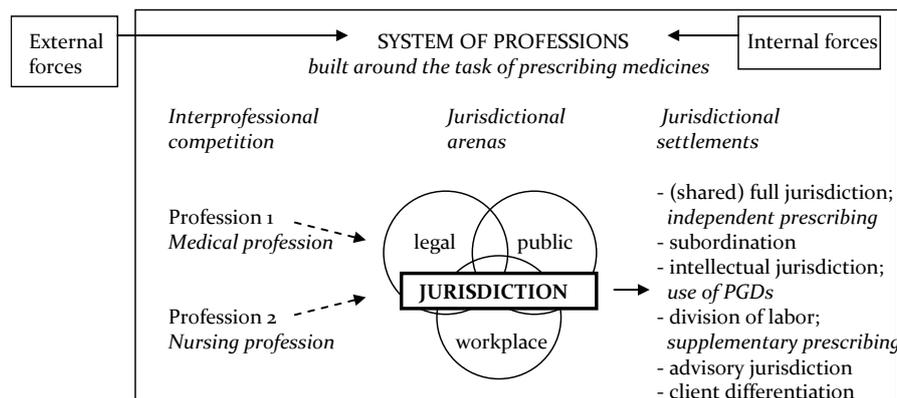
Abbott [7] extensively discusses the internal and external forces that shape professional competition over jurisdiction. Examples of external and internal forces that could possibly shape professional competition over prescribing rights are, respectively, striving for a more cost-effective healthcare system and a shortage of doctors within the healthcare workforce [10]. However, ‘there are only so many full jurisdictions to go around’ [7]. Consequently, most

professional conflicts over jurisdiction result in so-called 'limited jurisdictional settlements', of which Abbott distinguishes five:

- *Subordination*: the second most desired outcome of a jurisdictional conflict, as the incumbent profession controls the division of labor in which one or more subordinate groups take their place.
- *Intellectual jurisdiction*: in which the incumbent profession controls the cognitive knowledge of an area but allows practice by other professions.
- *Division of labor*: in which the jurisdiction over a certain task is divided between professions into 'functionally interdependent but structurally equal parts'.
- *Advisory jurisdiction*: the weakest form of control, whereby a profession seeks 'a legitimate right to interpret, buffer or partially modify actions another takes within its own full jurisdiction'.
- *Client differentiation*: in which segments of a profession serve different client groups. This is considered a workplace settlement by Abbott.

Figure 3.1 shows a graphic and partial representation of Abbott's theory, applied to the case of nurse prescribing.

Figure 3.1 Graphic and partial depiction of Abbott's theory applied to the case of nurse prescribing



Although this article focuses on the introduction and realization of legal nurse prescribing, potential jurisdictional claims over prescribing held by one of the involved professions in other arenas were also included in our model, since they might influence claims made in the legal arena. For example in the

United States of America, as Abbott [7] states, it is 'through public opinion that professions establish the power that enables them to achieve legal protection'. And as Sampson [11] states, a strong cohesive nursing community, grassroots legislative constituency and patient support are crucial in political battles over prescribing rights. We also applied Abbott's potential settlements of a jurisdictional conflict to the case of nurse prescribing (see figure 3.1). For this purpose, the three general models of (nurse) prescribing usually distinguished in the literature were used as a point of departure:

#### *Independent prescribing*

Legally permitted and qualified independent prescribers are responsible for the clinical assessment of a patient, the establishment of a diagnosis and decisions about the appropriateness of a medication, treatment or appliance, including the issuing of a prescription [12,13]. Prescribing usually takes place from a limited formulary – a list containing a limited and defined number of medicines that can be prescribed – or an open formulary. This type of prescribing is also referred to as initial, autonomous, substitutive and open prescribing [4,14]. Where nurses are able to independently prescribe medicines, with a fair range of prescribing freedom concerning medicine choice, we considered both the nursing and the medical profession to hold equal and full jurisdiction over prescribing, according to Abbott's classification (see figure 3.1). It should be noted however that this is an exceptional case, as it is very rare for two groups to hold equal jurisdiction in a particular task area [7].

#### *Supplementary prescribing*

Supplementary prescribing is defined as a voluntary partnership between an independent prescriber – a doctor or a dentist – and a supplementary prescriber – usually a nurse or a pharmacist. After the initial assessment and diagnosis of a patient's condition have been carried out by the independent prescriber, the supplementary prescriber may prescribe from an open or limited formulary and will collaborate or consult with the independent prescriber before issuing the prescription, even though direct supervision is not required [13-16]. Because of the clear delineation of areas of responsibility, we considered supplementary prescribing as a 'division of labor' in Abbott's terms (see figure 3.1).

In the United Kingdom, an important additional feature of supplementary prescribing is formed by the collaboration between the independent and

supplementary prescribers in drawing up a Clinical Management Plan which needs to be approved by the patient before implementation [15,16]. Supplementary prescribing is also known as dependent, collaborative, semi-autonomous or complementary prescribing [4,14].

#### *Patient group directions*

Patient group directions (PGDs), formerly known as group protocols, refer to written instructions for the supply and administration of named medicines in an identified clinical situation [4,14,17,18]. Drawn up by a multidisciplinary team, they are specifically designed for a particular group of patients with a specific condition, thus excluding individualised prescriptions [19]. Group protocols should not be seen as independent prescribing, since nurses or other health care professionals are only allowed to supply and administer medications within the strict terms of a predetermined protocol, albeit using their own assessment of patient need [16,18]. Because PGDs are developed by a multidisciplinary team – usually consisting of doctors, pharmacists and nurses – we considered the ‘intellectual jurisdiction’ over the prescribing task to lie with the team, according to Abbott’s classification, even though the nurse performs the actual task (see figure 3.1).

Following Ryan, Cash and Hannis [20], ‘time and dose prescribing’, a fourth model sometimes distinguished in the literature, was not considered as a form of nurse prescribing in this review, as nurses are only allowed to alter the time and/or dosage of a particular medication. Furthermore, whilst the use of PGDs is not an actual form of prescribing, we nevertheless decided to include PGDs as a third model of prescribing in our study, considering their omnipresence in much of the nurse prescribing literature. Moreover, when using PGDs nurses do make a decision that refers to the medication itself, whereas with time and dose prescribing the decision to start with a particular medication has already been taken.

This article reports on the findings of a systematic review of the scientific and professional literature concerning nurse prescribing. The review is the first phase in a larger research project focussing on nurse prescribing and has a twofold aim. Firstly, to gain insight into the scientific and professional literature describing the extent to and the ways in which nurse prescribing has been realised or is being initiated in Western European and Anglo-Saxon countries. Secondly, to propose possible mechanisms underlying the

organisation of nurse prescribing internationally, and relate these to Abbott's theory on the division of expert labor [7].

The following questions were addressed:

1. To what extent has nurse prescribing of medicines been initiated or already realised in Western European and Anglo-Saxon countries?
2. As a result of which external and internal forces has nurse prescribing been initiated or already realised in Western European and Anglo-Saxon countries?
3. Under which legal, educational and organizational conditions are nurses allowed to prescribe medicines within Western European and Anglo-Saxon countries?
4. Which jurisdictional settlements can be discerned between the medical and nursing professions concerning the task of prescribing medicines?
5. Which mechanism, if any, can be discerned between the forces that lead to the introduction of nurse prescribing and the resulting jurisdictional settlements between the medical and nursing professions?

### **3.2. Methods**

#### ***Search strategy***

The following six electronic databases were searched without any limitation as to date of publication or language: PubMed, Embase, CINAHL, Web of Science, EBSCO Academic Search Elite and the NIVEL-catalogue. Searches were highly sensitive, using the following search strategy for PubMed: ("Nurse prescribing") or (Nurs\* [tiab] AND Prescri\* [tiab]) or (Nurses [MeSH] AND "drug prescriptions" [MeSH]) or (Nurses [MeSH] AND formulary [tiab]). Suitable search strategies were developed for the other databases, using adaptations of the PubMed search. All detailed search strategies can be found in additional file 3.1 'Search strategies'.

In addition to the electronic databases, the following relevant websites were searched: the website of the Virginia Henderson International Nursing Library ([www.nursinglibrary.org](http://www.nursinglibrary.org)), the website of the World Health Organization ([www.who.int](http://www.who.int)), websites for health professionals ([www.nurse-prescriber.co.uk](http://www.nurse-prescriber.co.uk), [www.nursingtimes.net](http://www.nursingtimes.net), [www.escriber.com](http://www.escriber.com), [www.internurse.com](http://www.internurse.com)) and Google Scholar ([scholar.google.com](http://scholar.google.com)). Since most of these websites lacked advanced search facilities, the following keywords were used to search for relevant

publications: “nurse prescribing”, “independent (nurse) prescribing”, “autonomous prescribing” “supplementary (nurse) prescribing”, “dependent (nurse) prescribing”, “collaborative prescribing”, “group protocols” “patient group directions”, “time and dose prescribing”, “nurse formulary” and combinations of these keywords. All detailed search strategies can be found in additional file 3.1 ‘Search strategies’. Additionally, we consulted experts in the field to identify any studies that might have been missed.

The hits of all searches were entered into Reference Manager©; duplicates were sifted out in this program, and the inclusion process was executed thereafter.

### ***Study selection***

Publications from 2005 onwards had to fulfil all of the following criteria in order to be included:

1. The publication concerns a situation in which legal nurse prescribing of medicines is being initiated or has already been realised. We considered legal nurse prescribing as ‘being initiated’ if at least a change in the law, or new legislation enabling nurses to prescribe medicines was in preparation, either at national, provincial or state level.
2. The publication addresses legal nurse prescribing of medicines within the geographical context of at least one Western European or Anglo-Saxon country. Since the definition of Western Europe is complex and carries economic and cultural connotations, we adopted the definition of the renowned National Geographic Society.
3. The publication specifies either the external or internal forces under which legal nurse prescribing has been initiated or realised, or the legal, educational or organizational conditions under which nurses are allowed to prescribe medicines.
4. The group of professionals with prescribing rights discussed in the publication includes registered nurses (but not Physician Assistants).
5. The publication is a professionally or scholarly ‘sound’ publication, i.e. a scientifically peer reviewed publication or a publication by a government body or professional association.

Because we aimed to describe nurse prescribing as it is currently being initiated or has been realised in Western European and Anglo-Saxon countries, publications from 2005 and later had to meet all the inclusion

criteria. However, in view of our comparative theoretical framework, we were also interested in the external and internal forces that led to the introduction of nurse prescribing and which influence the system of professions and the division of jurisdictions between professions. As these forces are mainly found in publications dating from the period of introduction, and nurse prescribing has been established in some countries for years, publications prior to 2005 were also included in the review. However, as our review is only concerned with contemporary nurse prescribing practices, publications prior to 2005 did not have to fulfil the second part of inclusion criterion 3, i.e. they did not have to address the conditions under which nurses are allowed to prescribe medicines.

Publications were excluded if:

1. They focused on legal nurse prescribing in countries other than Western European and Anglo-Saxon countries .
2. They exclusively related to legal nurse prescribing of appliances and dressings and made no reference to legal nurse prescribing of medicines.
3. They only concerned nurse prescribing by specified group protocols that severely limit the prescribing rights of nurses, more specifically group protocols for (emergency) contraception, child and travel vaccinations and annual influenza vaccinations.
4. They merely related to time and dose prescribing.
5. They focused solely on illegal rather than legal nurse prescribing of medicines.
6. They only discussed the prescribing rights of midwives and/or nurses holding midwifery credentials – the latter only if their prescribing rights were based on their midwifery credentials or if uncertainty existed about the underpinning of their prescribing rights.

In some cases the boundary between nurses and midwives proved blurred, for example in the case of the American certified nurse-midwife, who is an advanced practice nurse with specialized education and training in both nursing and midwifery. We adopted a consistent approach to this issue and excluded all midwives from the review. Specialised nurses working in an obstetrics department without holding a midwifery certification were included.

A three-stage inclusion process was applied. All references found in the literature search of databases and websites were initially studied independently by title and abstract by pairs of reviewers (MK, ALF and LvD) and included in the study if they met the above mentioned criteria. All references deemed eligible for inclusion by at least one reviewer proceeded to the next selection round.

In the second stage, pairs of reviewers (MK, ALF and LvD) independently examined the remaining references once more by title and abstract. References from 2005 onwards that – on closer scrutiny – did not meet all inclusion criteria were excluded. All references prior to 2005 that did not explain the external or internal forces under which nurse prescribing was initiated or realised were likewise excluded. Again, all references deemed eligible for inclusion by at least one reviewer were included. However, because of the abundance of UK-based references selected in the first two stages, and the large number of internal and external forces mentioned in these references, the first author, after discussion with the other two reviewers, excluded all UK-based references prior to 2005 from the review before turning to the final selection round.

In the final stage, the full text of all remaining publications was obtained. Pairs of reviewers (MK, ALF and LvD) independently studied each publication in order to determine whether it fulfilled the inclusion criteria, and disagreements were resolved by discussion.

Where several publications were based on the same study, containing identical information, the first author only selected the most recent as well as the most elaborative publication for final inclusion in the review.

#### *Additional step during study selection*

During the study selection process, the first reviewer drew up a list containing all Western European and Anglo-Saxon countries referred to in the titles and abstracts of the initial search results as having initiated or realised nurse prescribing. It was assumed that countries missing on the resulting list had not initiated or realised nurse prescribing. To make sure that this division into ‘prescribing’ and ‘non-prescribing’ countries corresponded with the current state of affairs across countries, we verified our findings with representatives of leading national nurses and medical associations and government representatives.

### ***Data synthesis and analysis***

The first author (MK) extracted data from the included publications onto digital structured data-extraction forms, and two other authors (ALF and LvD) checked the extracted data. Disagreements were resolved by discussion between the review authors. Data were extracted on country, external and internal forces that led to the introduction of nurse prescribing; the educational and organizational criteria that must be fulfilled in order for nurses to prescribe medicines; the legal conditions in place; the financial issues with regard to nurse prescribing and; where appropriate, the models of nurse prescribing being used.

We used Abbott's theory on the division of labor as a point of departure to organize and summarize the data. Abbott pays considerable attention to the internal and external forces that shape professional competition over jurisdiction – in this case the jurisdiction over prescriptive authority. Moreover, he proposes a number of 'jurisdictional settlements' that are easily compatible with the three general models of nurse prescribing usually distinguished in the literature. These models mainly focus on the legal conditions in place. As educational and organizational conditions further determine the organization of nurse prescribing and hence the outcomes of jurisdictional conflicts, data were eventually organized under the following broad themes: forces related to the introduction of nurse prescribing; legal conditions under which nurse prescribing of medicines will be or has been realised; educational conditions under which nurse prescribing of medicines will be or has been realised; and the organizational conditions under which nurse prescribing of medicines will be or has been realized.

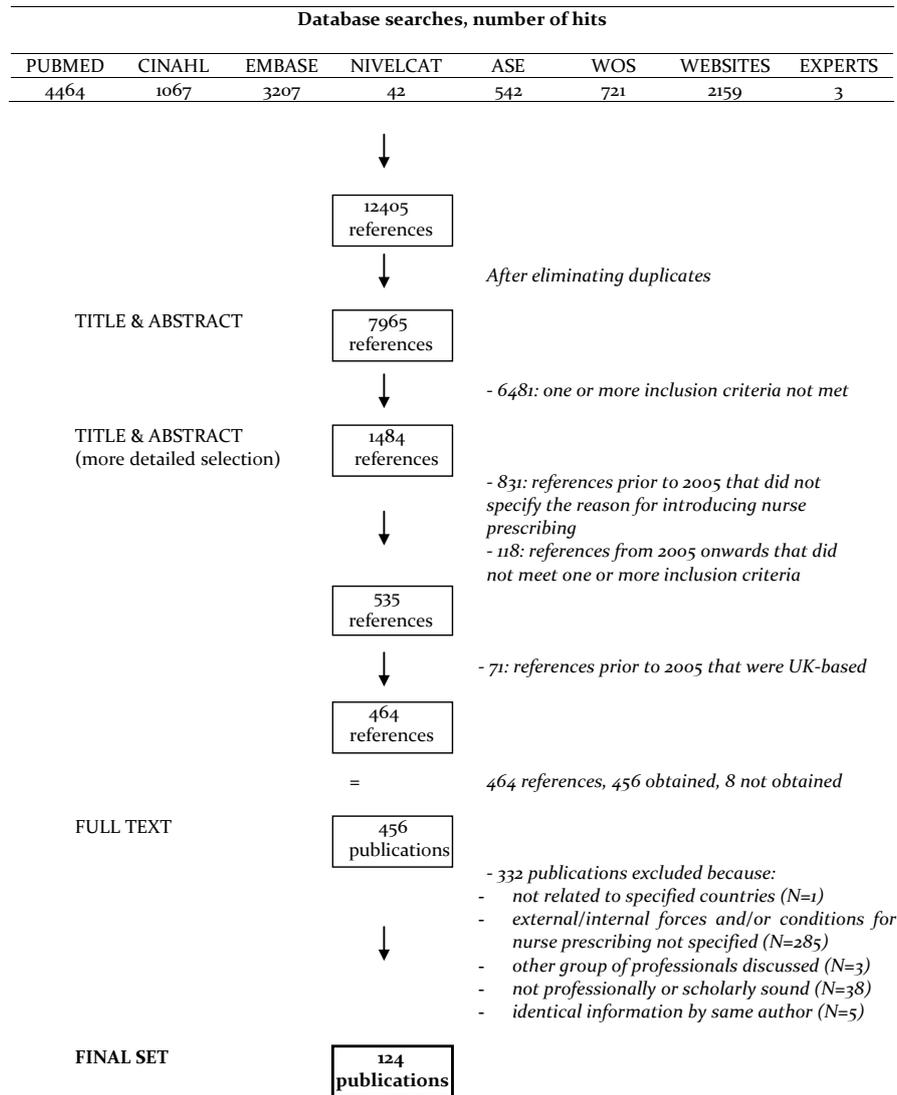
## **3.3. Results**

### ***Search and inclusion results***

After duplicates had been removed, the searches resulted in an initial set of 7965 references of potential interest. Following a first sifting based on title and abstract, 1484 references were selected for more detailed scrutiny by title and abstract. The resulting set of 464 articles was ordered in full text. After application of the inclusion criteria, 167 studies were deemed eligible for inclusion, of which 5 publications contained duplicate information by the same author and 38 publications did not live up to our 'soundness' criteria. Finally, 124 publications were selected for the next stage of the review, for

data-extraction and analysis. Figure 3.2 shows the flow diagram of the inclusion process.

Figure 3.2 Flow diagram of the study selection process



### ***Characteristics of the final 124 publications***

#### *Countries of interest*

Additional file 3.2 'Characteristics of included publications' provides a descriptive overview of all included publications. The majority of included publications focussed on one country (N=99) [21-119]. Of these, seventy-five publications were based in the United Kingdom, ten in the United States of America, five in New Zealand, four in the Netherlands, two in Ireland and the rest in Australia, Canada or Sweden. Twenty-three publications made reference to multiple countries, almost always including the UK and the USA [120-142]. Just two international comparative nurse prescribing publications were included in the review, covering 10 and 12 countries respectively [5,6].

As said before, it was assumed that countries not mentioned in the titles and/or abstracts of the search results had not initiated or realised nurse prescribing. We checked our findings regarding 'nurse prescribing countries' with relevant stakeholders across Western European and Anglo-Saxon countries (see additional file 3.3: Results of verification literature search with relevant stakeholders in Western European and Anglo-Saxon countries). This proved fruitful, as we were informed that an implementation process for nurse prescribing is currently being rolled out in Finland. However, since no literature on Finland was identified through our search strategy, Finland will not feature in our results section. From all other Western European and Anglo-Saxon countries that were not identified with our literature search, we received confirmation that nurses are indeed not allowed to prescribe medicines and no implementation process is being initiated.

#### *Date and type of publications*

Most publications were published in 2008 and 2009. The oldest publication included in the review dates from 1982 and the most recent ones from 2010. Publications were derived from a variety of sources, including fifty-five journals and magazines, four books and three reports.

#### *Main focus of publications*

There was much diversity as to the main focus of the included publications. Nevertheless, a number of recurring themes could be discerned, such as the views of nurses, doctors and other parties involved concerning nurse prescribing [45,47,51,53,81,94,108,109,115,121,139], prescribing behaviours of nurses [36,43,124,126,128,129,131,137], and nurse prescribing in relation to specific diseases [38,44,84,89,91-93,101,108,116,125] – most notably concerning

nurse prescribing in mental health care [21,32,39,67,76,83,100,102,104-106,132,135]. Also, a number of publications focussed on the history and evolution of (nurse) prescribing of medicines, but these remained relatively limited [5,6,46,48,49,75,90,96,103,142].

#### *Nurse prescribing themes discussed*

Four broad themes were considered to be relevant for the organization of nurse prescribing internationally and the outcomes of jurisdictional competition over the prescription of medicines. All publications were labelled with appropriate themes (see additional file 3.2: Characteristics of included publications). Table 3.1 provides an overview of publications per theme. The content of these themes will be discussed later. Additional file 3.4 provides a descriptive overview of nurse prescribing across Western European and Anglo-Saxon countries at national level.

Table 3.1 Identified themes of nurse prescribing

<b>Nurse prescribing theme</b>	<b>Studied by</b>
Internal and external forces related to the introduction of nurse prescribing	[5,6,21-42,44-47,51,52,54-56,58-69,73-76,79-90,92-94,96,97,100,102-104,106-112,114-118,120-125,127,128,130-138,140-142]
Legal conditions under which nurse prescribing of medicines will be or has been realised	[5,6,21,23-29,31-35,37-40,42-53,56-58,60,61,63-66,68-73,76,78,82-85,89,92,94,95,97,98,100-105,108-110,112-114,116-121,123-129,131-139,141,142]
Educational conditions under which nurse prescribing of medicines will be or has been realised	[5,6,21,22,24-29,32-34,37-40,42,44,46-53,55-57,60,63-67,69,71,72,76-79,82,84,85,88-95,97,99-101,104,105,107-110,112-114,116-118,122-128,131,132,134-142]
Organizational conditions under which nurse prescribing of medicines will be or has been realised	[5,6,22,23,27,29,40,42,46,47,50,55,64,65,69,71,72,77,79,85,89,91,92,95,99,116,125,128,129,135,137,142]

#### *Initiation and realization of nurse prescribing*

##### *Year of introduction*

It is notable that nurse prescribing was introduced at very different points in time in the seven Western European and Anglo-Saxon countries that have so far realised nurse prescribing, viz. Australia, Canada, Ireland, New Zealand,

Sweden, the United Kingdom and the United States of America. While nurse prescribing has been in place in the USA since the 1960s [5,6,30,107,115,123,128,134,135,138], it is a relatively new phenomenon in most other countries. Table 3.2 presents an overview of the (expected) year of introduction of nurse prescribing in Western European and Anglo-Saxon countries. While community nurses were the first group of nurses to start prescribing in the UK in 1998, one should note that in the years thereafter two other models of nurse prescribing were introduced there: in 2002 the form now known as ‘independent prescribing’ was implemented [5,6,24,32,48,49,56,68,72,76,84,87,100,101,121,124,136], followed by ‘supplementary prescribing’ in 2003 [5,6,24,26,27,32,35,36,40,42,46,47,49,52,56,62,67-69,72,76,78,81,83,91-94,101,104,121,123,124,136,138].

Currently, nurses in the Netherlands are awaiting for the final amendments to legislation to enable them to start prescribing [5,58,117,118], and in Spain the legal regulation of nurse prescribing is in the procedural phase [5].

Table 3.2 Year of introduction of nurse prescribing

Year of introduction	Country
1960s	United States of America [5,6,30,107,115,123,128,134,135,138]
Early 1990s	Canada [6]
1994	Sweden [5,6,85,112,125,127,136]
1998	United Kingdom [5,6,25,27,40,42,46,48,56,57,62,67-69,72,76,78,85,98,100,101,104,114,116,122,135]
2000	Australia [5,129]
2001	New Zealand [5,6,122,138]
2007	Ireland [5,55,115,139]
Expected in the near future	The Netherlands [5,117,118]
Expected in the future	Spain [5]

#### *Forces related to the introduction of nurse prescribing*

External and internal forces which led to the introduction of nurse prescribing were mentioned in hundred and two of the hundred and twenty-four publications included. In the Netherlands, the aim of task reallocation in the health care sector and more particularly the undesirable situation in which nurses prescribe medicines on an illegal basis, have been the main driving force behind the introduction of nurse prescribing [117,118]. The objective of creating quicker and more efficient patient access to medicines has also been highly influential in the introduction process of nurse prescribing internationally, especially within the UK and Ireland [21,25,26,29,31,32,34-

37,39,42,46,47,51,52,55,58,61,62,64,67,69,76,82-84,87,89,90,94,100,102,104,106, 112,114,116,120,128,132,135-137,140]. Another important force in this process has been the aim to make better use of nurses' skills and knowledge, and to improve the use of both health professionals' and patients' time [5,6,23,26,30,34,37,39,41,42,44,46,47,51,52,55,56,60,64,66-69,73-76,79,84,86, 87,89,90,92,93,100,102,103,106,109,115-118,124,125,130,132-134,137]. Whereas these seem to have been the main drivers behind the introduction of nurse prescribing in the UK and Ireland, forces originating from within the health professions appear to have prevailed in other countries. In Australia, Canada, New Zealand, Sweden and the USA nurses were granted prescribing rights in order to reduce the workload of doctors and physicians, address the shortage of physicians – partly resulting from the growing specialisation of health professionals – and meet the medication needs of patients in remote areas who were often suffering as a result of a shortage of physicians [5,6,22,28,30,33,34,41,51,59,61,85,85,86,107,120-122,124,125,127,128,131,135,138]. Moreover, prescriptive authority for nurses in Canada, New Zealand and the USA followed the development of advanced practice nurse (APN) roles [5,61,74,124], which clearly connects their prescribing privileges with internal developments within the nursing profession.

#### ***Legal conditions regarding nurse prescribing***

All Western-European and Anglo-Saxon countries that have realised or initiated nurse prescribing have imposed legal restrictions on which categories of nurses can prescribe medicines, what, how much and to whom they can prescribe, and whether they are allowed to do so on an independent basis or under the supervision of a physician. In most countries, these issues are regulated at national level, but in some, such as Australia, Canada and the USA, prescriptive authority is regulated at federal, state or regional level [5,6,28,85,125,129,131].

Table 3.3 offers an overview of prescriptive authority for nurses across Western European and Anglo-Saxon countries. Independent prescribing rights were granted to nurses across all countries that have introduced nurse prescribing or are set to do so in the (near) future. Some countries introduced other models of nurse prescribing as well, such as supplementary or collaborative prescribing – prescribing in partnership with a physician – or the use of Patient Group Directions (PGDs) or medical directives by nurses to supply and administer medicines to patients [6,24,27,39,40,61,64,71,72,78 ,105,128]. For example, in over half of the US states nurses have full

independent prescriptive authority, whereas in other states mandatory collaboration with and/or supervision by a physician is required [5,6,28,54,59,75,96,124,135,137]. Likewise in the Netherlands in the future, Nurse Specialists will be allowed to prescribe on an independent basis, although this authority will be limited to a maximum 'experimental period' of five years [117], while specific categories of specialist nurses will prescribe through a model resembling supplementary prescribing [118].

Even though nurses in all countries are (or will be) allowed to prescribe medicines on an independent basis, their scope of practice or freedom to act varies considerably, depending on whether or not protocols and/or formularies are in place and if so, how restrictive these are. In Ireland nurse prescribers may independently prescribe from an open formulary specific to their field of clinical practice [5,139] whereas in the UK independent prescribers can prescribe from the entire British National Formulary (BNF), including unlicensed medicines and some controlled drugs [5,24,26,35,44-46,48,49,51-53,63,65,68,69,76,78,83,84,92,94,100-103,105,108,109,113,126,128,136,137,139]. Supplementary prescribers in the UK can in addition prescribe all controlled drugs, provided they are listed in a clinical management plan agreed by the independent prescriber, nurse and patient [5,21,24,26,27,35,38,40,43-45,48-53,63,76,78,82,95,100,101,108,114,123-126]. Community practitioner nurse prescribers in the UK however, have their own more limited formulary to prescribe from [5,27] and in South Australia, every nurse practitioner has their own individual formulary of medicines from which to prescribe [129]. Most Australian states however, just as a number of American states, Canadian provinces and Sweden, have general limited formularies for nurse prescribers in place [5,6,28,85,90,112,125-127,136]. Other commonly used means to restrict nurses independent prescriptive authority are protocols. The Australian states of New South Wales and Queensland, a number of American states, Canadian provinces and the Netherlands all (will) use protocols in enabling nurse prescribing [28,58,61,118,119,133].

Table 3.3 Prescriptive authority for nurses in Western European and Anglo-Saxon countries

Country	Prescriptive authority		
	Independent	Collaborative/ supplementary	Use of PGDs/ medical directives
Australia	√		√
Canada	√		√
Ireland	√		
Netherlands*	√	√	
New Zealand	√		
Spain*	√	√	
Sweden	√		
United Kingdom	√	√	√
United States of America	√	√	

\* Intended form(s) of prescriptive authority, nurse prescribing is not yet legal (see table 3.2)

When it comes to legal restrictions regarding patients and/or medical conditions for which nurses are allowed to prescribe medicines, the UK has granted nurses the most extensive prescription privileges. Community practitioner nurse prescribers can prescribe for a number of common conditions, but both independent and supplementary nurse prescribers can prescribe for any medical condition or patient group within their clinical competence [5,25,27,35,40,50,52,63,68,69,71,78,84,89,92,94,95,100-102,105,109]. A PGD can in principle also be drawn up for any medical condition, but should be reserved for those situations where it offers ‘an advantage for the patient without compromising patient safety’ [40,72]. In most other countries however, restrictions apply. In Sweden, only district nurses and nurses working in elderly care may prescribe for 60 conditions [5,6,85,125,127,136] and in Ontario (Canada) nurses can only prescribe in primary care, long-term care and outpatient clinics [61]. In New Zealand, prescriptive authority was for a long time granted only to nurses working in specific areas of care [90,125,138,139] but this recently appears to have been expanded to include the whole NP scope of practice [5].

The formal responsibilities that nurse prescribers carry are clearly defined in most Western European and Anglo-Saxon countries. For example, in the Canadian province of British Columbia, registered nurses who initiate medicines are ‘fully responsible and accountable’ for their prescription [61], and in Massachusetts (USA) nurses likewise assume responsibility for

prescribing [134]. As the prescription of medicines forms just one element in the medical care of a patient, formal responsibilities are also established for the related tasks in the treatment process, viz. accountability and responsibility for the clinical assessment of a patient and the establishment of a diagnosis. In Australia, for example, nursing curricula focus on 'taking full responsibility for patient's treatment' [5]. In the UK, responsibility for the various aspects of the treatment process differs between the three categories of nurse prescribers. Independent nurse prescribers and qualified community nurse prescribers are responsible for the clinical assessment and diagnosis of a patient and for decisions about the clinical management required, including prescribing [27,40,47,48,51,56,69,72,78,83,84,89,92,100,102,108-110,114,124-126,136-138]. Supplementary prescribers, however, are only responsible for the continuing care of a patient, including prescribing, whilst the collaborating independent prescriber shares the responsibility for prescribing and holds full responsibility for the assessment and diagnosis of a patient [25,40,47-49,51,56,63,69,72,78,84,100,103,123,124,135]. In the Netherlands likewise, specialist nurses are only allowed to prescribe medicines after a diagnosis has been made by a doctor [118].

### ***Educational conditions regarding nurse prescribing***

In all Western European and Anglo-Saxon countries that have realised legal nurse prescribing, nurses are required to successfully complete a prescribing course before they are allowed to start prescribing [55,88,107,112,114,122,123,131,134,137-139,141,142]. However, no specific training is required for UK nurses using PGDs, although most individual Trusts provide some in-house training [24,39,40,105].

Regarding the place that nurse prescribing training occupies within the various national education systems and the level at which it is provided, there are differences between countries. Education programmes for nurse prescribing in Ireland as well as independent and supplementary prescribing courses in the UK, which are combined into a 'dual qualification' [5,32,33,44,51,53,64,72,93,110,116,122-126], are offered on a stand-alone basis, i.e. they are not part of a regular nursing curriculum. However, training to prescribe from the British Nurse Prescribers Formulary for Community Practitioners is incorporated into Specialist Practitioner Programmes [5,6,22,27,40,49,107,138] and in Sweden prescribing training is part of the Primary Health Care Specialist Nursing programme, undertaken by all district nurses [5]. In the Netherlands, it is anticipated that independent prescribing

for Nurse Specialists will become an obligatory component of the Masters programme of Advanced Nursing Practice [5,117], just as in New Zealand where preparation courses for nurse prescribing are offered within a Masters programme for advanced nursing practice or as a stand-alone Post Graduate Diploma (Prescribing) for nurses who already completed a Masters [5,6,22,27,40,49,107,138].

There are also differences between countries regarding the educational level of nurse prescribing training. Where most countries, including Australia, Canada, New Zealand, the Netherlands and the USA require nurses to complete a master level degree before they are allowed to prescribe independently, the Irish nurse prescribing training is awarded at level 8 in the Irish education system – which is comparable to Honours Bachelor Degree level – and in the UK prescribing courses are taught at undergraduate level 3 (degree level) [5,6,24,27-29,37,48,50,52,53,56,60,63-65,69,72,76,77,79,84,88,89,91,95,99,107-109,116,120,122-125,131,134,137,138,140-142]. This is remarkable when we recall that nurses in Ireland and especially nurses in the UK have very broad independent prescribing rights. In the Netherlands, specialist nurses who will prescribe through a model resembling supplementary prescribing will be trained at Bachelor degree level [118].

Criteria to enter prescribing courses are relatively similar across countries. One of the most important requirements for nurses internationally to enter prescribing programmes is sufficient clinical experience. However, the minimum number of years of clinical experience required varies. In Ireland and the UK, three years of clinical experience are required [5,29,42,53,71,84,108,109,124,126,137,140], whereas in New Zealand, nurses must have at least four years of clinical experience in their speciality area [107,122]. In Australia as of January 2010, nurses must have five years of clinical experience in their own field of practice, before they are eligible for endorsements as a nurse practitioner and hence for prescribing medicines [5]. Thus, it seems that the UK and Ireland have lower educational- and clinical experience requirements in place for nurse prescribing than other Western European and Anglo-Saxon countries.

Another important requirement that often needs to be fulfilled, for example in Australia [131], New Zealand [107] and the UK [37,38,42,53,65,84,95,99,137], is the ability of nurses to demonstrate clinical assessment and clinical decision-making skills. In the UK, additional prerequisites for potential nurse prescribers include nurses' ability to arrange for a Designated Medical Practitioner (DMP) who will supervise them during their practice period and

they must occupy a post in which nurse prescribing will enhance patient care [5,26,40,50,52,53,77,95,97,108,109,125].

The content of training programmes for nurse prescribing seems to be fairly similar across countries. Swedish nurses attend lectures on pharmacology, pharmacovigilance (PV/PVG) and adverse drug reaction (ADR) reporting [5]. In Australia [5], Ireland [5], New Zealand [5,122,138] and the UK, pharmacology likewise constitutes an important topic in the prescribing training, just as the legal and ethical aspects of prescribing and clinical decision making [5,48-50,52,110,114,122,124,125,132,136]. In the literature, assessments performed during or at the end of the prescribing course were only specified for the British situation and could therefore not be compared across countries. In the UK these include the completion of a portfolio and an assessment of nurses' calculation skills, on which a 100% score must be attained for independent and supplementary prescribing [5,21,29,38,40,50,52,89,100,113,116,122,127].

### ***Organizational conditions regarding nurse prescribing***

The organizational conditions under which nurses are allowed to prescribe medicines in Western European and Anglo-Saxon countries are much less discussed in the literature than educational and legal conditions for nurse prescribing. It is nonetheless clear that most countries operate some sort of mandatory registration system in which nurse prescribers have to be registered before they are allowed to prescribe. In Australia, nurses have to submit a formulary of all the medicines they may prescribe to their respective Nursing Boards as part of their endorsement process [5,88]; in the Netherlands prescribing nurses must be registered in the 'BIG' registration system kept by the Ministry of Health [117,118]; and in Ireland [5,115,139], New Zealand [5,6,79], the UK [5,22,23,29,38,42,71,77,85,91,92,95,116,142] and the USA [134] nurse prescribers must register their qualification with their respective national regulatory nursing bodies.

In the UK, the Nursing and Midwifery Council (NMC) together with the National Prescribing Centre (NPC), have defined the 'standards of proficiency that underpin principles of prescribing practice' [27,87,137], and several UK-based publications refer to nurses' responsibility to maintain and update their prescribing knowledge, known as continuing professional development [5,32,33,35,40,50,60,62,89,136]. These topics nevertheless draw little attention in the literature and are virtually absent in publications relating to the other Western European and Anglo-Saxon countries that have realised nurse

prescribing, with the exception of Ireland and New Zealand where continuing education and development are also being stressed [5].

The financial aspects of nurse prescribing were touched upon in a mere nine publications. In the UK, funding to undertake nurse prescribing training is made available from central government through local level organizations, such as workforce development confederations, strategic health authorities and local NHS Trusts [40,42,46,47,65,69,72]. However, medical supervisors of nurses during their practical training period in the prescribing course are generally not financially rewarded for their support [40,99]. Moreover, in the UK, access to a prescribing budget needs to be created for nurse prescribers before they can perform their role [40,85]. Another important point that has scarcely been touched upon in the literature is the reimbursement of prescriptions written by nurses. In New Zealand, if a nurse practitioner prescribes a medicine, the costs to the patient are the same as if a doctor prescribes [129]. However, in several states of the USA, the social welfare program Medicaid does not reimburse prescriptions written by nurses [135].

### **3.4. Discussion**

Nurse prescribing of medicines is a major area of interest in the scientific as well as professional literature, as shown by the high number of identified publications. This review provides insight into the diversity of external and internal forces which led to the introduction of nurse prescribing in the nine identified Western European and Anglo-Saxon countries, while shedding light on the variety of legal, educational and organizational conditions in place. Moreover, by applying Abbott's theory on the division of labor in modern societies, a variety of jurisdictional settlements between the nursing and medical professions concerning the task of prescribing were discerned.

**Models of nurse prescribing and jurisdictional settlements**

In the introduction to this article we briefly discussed the three general models of (nurse) prescribing usually distinguished in the literature, viz. independent prescribing, supplementary prescribing and the use of patient group directions (PGDs). However, these models appear to be largely based on the situation in the UK and may be less applicable to nurses' prescriptive authority in other Western European and Anglo-Saxon countries. For example, we found that nurses in Sweden and Ontario are only allowed to independently prescribe for a limited number of medical conditions. Hence,

their prescribing practices do not fit with the common definition of 'independent prescribing' in which nurses enjoy unrestricted independent prescribing freedom with regard to medical conditions.

However, broadly speaking, all nine Western European and Anglo-Saxon countries identified in this review grant some form of independent prescribing authority to nurses, albeit with varying levels of autonomy. But where we considered 'independent prescribing' in the introduction as a situation in which both the nursing and medical professions hold equal and full jurisdiction over prescribing, according to Abbott's classification, this does not hold for all countries. Only in Ireland and the UK, where nurses' scope of prescribing practice is fairly extensive, did the level of autonomy prove sufficient to consider both the nursing and medical professions to hold equal and full jurisdiction over prescribing. All the other countries imposed such stringent restrictions on nurses' independent prescriptive authority via protocols and/or limited formularies of medicines, that the medical profession still has exclusive full jurisdiction over the prescribing task. Since nurses are often only allowed to prescribe relatively harmless medication in these countries, the medical profession has delegated to them the 'routine' part of prescribing and remains in control over the complex and professionally more important part. Hence, nurses prescribe on the basis of a subordinate jurisdiction.

Moreover, some countries such as Sweden not only place restrictions on the medicines that nurses are allowed to prescribe, but also on the type of patients for whom nurses may prescribe. Because of the inclusion of elements of client differentiation, we consider this an even more restrictive form of subordinate jurisdiction, thereby disputing Abbott's assumption that client differentiation is only a workplace settlement.

It is possible that these subordinate settlements of nurse prescribing constitute phases in a process towards shared full jurisdiction for the nursing profession. After all, the road towards extensive prescribing rights for nurses in the UK was also a gradual process, and we note that in New Zealand prescriptive authority was recently expanded to include the whole NP scope of practice [5]. Nonetheless, movements in countries other than the UK are generally slow. In some countries, hardly any developments have been made since the initial introduction of nurse prescribing, even though nurse prescribing was sometimes introduced at a (much) earlier point in time, such as in Sweden and the USA.

Whereas all nine Western European and Anglo-Saxon countries identified in this review have granted independent prescribing authority to nurses, some of them introduced other models of nurse prescribing as well, resulting in a variety of jurisdictional settlements. The requirements of several American states regarding physician involvement in nurse prescribing creates a model of prescriptive authority comparable to supplementary prescribing in the UK. In the Netherlands specific categories of specialist nurses will in the future also prescribe through a model resembling supplementary prescribing. Because of the clear distinction between areas of responsibility, we consider both supplementary prescribing and collaborative/supervised prescribing as forms of prescribing within a 'full division of labor', in Abbott's terms. PGDs and medical directives, on the contrary, are developed by a multidisciplinary team and a physician respectively, while the nurse is the one who uses them in daily practice. Hence, the 'intellectual jurisdiction' over the prescribing task lies with the developers.

Applying Abbott's classification system of jurisdictional settlements to the prescribing scope of nurses in Western European and Anglo-Saxon countries, it is clear that the jurisdiction over the prescribing task in most countries, apart from the UK and Ireland, remains predominantly with the medical profession.

### ***Mechanisms***

In view of the extensive prescribing privileges that nurses in Ireland and especially the UK enjoy, it is remarkable that requirements concerning number of years of clinical experience and educational level in these two countries proved less stringent than in other Western-European and Anglo-Saxon countries. Nurse prescribing training in the UK and Ireland is taught at (Honours) degree level and three years of clinical experience are required, whereas in most other countries where nurse prescribing was or is being introduced, nurses are trained at Master degree level. The number of years of clinical experience required is also higher in some countries, for example in New Zealand and Australia, where the limit is set at four and five years respectively. As Abbott states, internal and external forces shape professional competition over jurisdiction. In the UK and Ireland the emphasis was on enhancing efficiency when introducing nurse prescribing, i.e. striving for quicker and more efficient patient access to medicines and better use of health professionals' skills and knowledge. In other countries, however, more urgent internal needs such as a shortage of physicians and unmet medication

needs of patients in remote areas were the most important reasons for introducing nurse prescribing. Forces focussing on efficiency seem to lead to more extensive prescribing rights, at least for nurses in Ireland and the UK. This would appear to confirm Abbott's assumption that external and internal forces shape professional competition over jurisdiction. However, because of our focus on nurse prescribing, alternatives to prescribing, such as statutory exemptions and emergency provisions, were mainly left out of this review. Nevertheless, their possible presence across countries might have influenced the conditions under which nurse prescribing was realized as well, in addition to the influence of the internal and external forces we examined.

Perhaps the question as to whether or not national medical associations support the nurse prescribing initiative is also important when it comes to nurses' prescriptive authority. It is established that the British Medical Association in the UK has supported the nurse prescribing initiative from the outset [85] and this may have been beneficial to its extensive roll out. By contrast, in Australia, Spain and the USA, professional medical organizations have mainly opposed nurse prescribing [5,85,96], which may equally explain the relatively limited prescribing rights of US nurses, especially in view of the much longer period of familiarity with nurse prescribing in the USA compared to the UK.

However, on the basis of current data no definitive conclusions can be drawn about underlying mechanisms that operate between the forces that led to the introduction of nurse prescribing internationally and the scope of prescribing rights nurses enjoy. It would be interesting to further examine these mechanisms, preferably in a quantitative manner. Data on the percentage of total healthcare expenditure on medicines, number of physicians per capita and time of introduction of nurse prescribing could for example be used in an ecological analysis.

### ***Gaps in the literature***

An interesting finding in this review is the near absence in the literature of reference to practice-related and organizational conditions under which nurses are allowed to prescribe medicines. This hinders a comparison and further theoretical interpretation of the organization of nurse prescribing internationally. For example, even though we found that most countries have mandatory registration systems in place for nurse prescribers, it remains unclear whether all nurses have individually registered provider numbers. However, where prescribing has been introduced to improve cost-

effectiveness, individual provider numbers are needed to thoroughly monitor who prescribes which medicines how often and ascertain whether the implementation of nurse prescribing has had its intended effect.

When it comes to financial issues, likewise, many questions remain unanswered in the literature. What became clear however, is that reimbursement issues are not always properly catered for and this can, even with an otherwise good organisation, have far-reaching consequences for the success of nurse prescribing. For example, where medicines prescribed by nurses are not (fully) covered by insurance providers and/or national health programs, such as in some American states, this can generate an unfavourable reaction from the public towards nurse prescribing. Patients will prefer their physician to write their prescriptions, as reimbursement issues for this profession are well arranged. Consequently nurses might lose part of their workplace jurisdiction to the medical profession, who in their turn will claim more legal jurisdiction. Moreover, the fact that nurses' prescriptions are not always eligible for reimbursement underlines once more the full jurisdiction that medicine still has over prescribing, despite nurses' (limited) independent prescribing rights.

While we do not say that the organizational conditions have not been properly addressed across countries, they are largely missing from the literature. Both for interpreting the organization of nurse prescribing on a theoretical basis and for critically monitoring whether expected goals are being met, it is important that organizational conditions – as much as educational and legal conditions – are extensively discussed in the nurse prescribing literature.

### ***Limitations***

It could be argued that this systematic review does not give a complete picture of the state of the art, as a number of policy documents and other relevant grey literature might potentially have been excluded from the review by our choice of search strategy. We choose this strategy, however, to safeguard the quality of sources. Even though the number of references to the organizational conditions under which nurses prescribe medicines as identified in this review proved somewhat disappointing, it is unlikely that this is due to our search strategy, as the educational and legal conditions under which nurses are allowed to prescribe medicines were sufficiently addressed in the identified literature.

Furthermore, as nurse prescribing is still in the process of development, there is a possibility that some of the included literature may be out of date in certain respects or doesn't contain the most recent developments in nurse prescribing. We tried to prevent this by including only publications from 2005 onwards that discussed the legal, educational and organizational conditions under which nurses are allowed to prescribe medicines. Nevertheless, it might prove beneficial to conduct a further survey among relevant stakeholders across all Western European and Anglo-Saxon countries that have realised or initiated nurse prescribing. This might also shed light on information that was largely missing from the scientific and professional literature, such as the organizational conditions under which nurse prescribing has been or will be realised internationally.

### ***Challenges for future research***

Future research should provide more insight into the organizational and more especially the financial conditions under which nurses prescribe. These are not only important in everyday practice but are also indicators for the potential efficiency of nurse prescribing. There is also a need for more theory-based research on nurse prescribing. For example, we do not know how nurses' legal and workplace jurisdictions over prescribing relate to each other once legal prescriptive authority is obtained. There are indications that qualified nurse prescribers in the UK are not (fully) using their legal prescribing rights on the work floor, partly because of their own uncertainty about their educational preparation and partly resulting from organizational conditions such as a lack of system change within their work environment [36]. Future research should address this discrepancy between obtained legal authority and workplace jurisdiction. It is important to examine which mechanisms and forces influence this relationship.

### **3.5. Conclusions**

A diversity of external and internal forces has led to the introduction of nurse prescribing internationally. The precise nature of legal, educational and organizational conditions for nurse prescribing varies considerably, from situations where nurses prescribe independently to situations in which prescribing by nurses is only allowed under strict conditions and close supervision by physicians. As a result, a variety of jurisdictional settlements

between the nursing and medical professions concerning the task of prescribing can be discerned. In some countries, nurses share (full) jurisdiction with the medical profession, whereas in others nurses prescribe in a subordinate position. However, in most countries the jurisdiction over prescribing remains predominantly with the medical profession. There seems to be an underlying mechanism linking the jurisdictional settlements between professions with the forces that led to the introduction of nurse prescribing. Forces focusing on efficiency appear to lead to more extensive prescribing rights.

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## Additional file 3.1 Search strategies

### Databases

Search strategy Academic Search Elite dd. 06-01-2010

Search ID#	Search Terms	Search Options	Results
S21	TI nurs* and AB nurs*	Boolean/Phrase	31788
S22	TI prescri* and AB prescri*	Boolean/Phrase	4370
S23	DE "NURSES" (exploded)	Boolean/Phrase	32498
S24	TI formulary and AB formulary	Boolean/Phrase	123
S25	DE "DRUGS -- Prescribing" (exploded)	Boolean/Phrase	3732
S26	(S23 and S25)	Boolean/Phrase	222
S27	"nurse prescribing"	Boolean/Phrase	311
S28	(S21 and S22)	Boolean/Phrase	277
S29	(S23 and S24)	Boolean/Phrase	3
S30	(S26 or S27 or S28 or S29)	Boolean/Phrase	542

542 references were included in the original literature list.

Search strategy CINAHL dd. 06-01-2010

Search ID#	Search Terms	Search Options	Results
S1	TI nurs* and AB nurs*	Boolean/Phrase	61367
S2	TI prescri* and AB prescri*	Boolean/Phrase	2557
S3	(MH "Nurses+")	Boolean/Phrase	110856
S4	TI formulary and AB formulary	Boolean/Phrase	71
S5	(MH "Prescriptions, Drug")	Boolean/Phrase	2610
S6	(MH "Prescriptions, Drug") and (MH "Nurses+")	Boolean/Phrase	141
S7	"nurse prescribing"	Boolean/Phrase	727
S8	(S1 and S2)	Boolean/Phrase	509
S9	(S3 and S4)	Boolean/Phrase	1
S10	(S6 or S7 or S8 or S9)	Boolean/Phrase	1067

1067 references were included in the original literature list.

Search strategy EMBASE dd. 22-12-2009

No.	Search query	Results
1	nurs*:ab,ti AND [embase]/lim	77087
2	prescri*:ab,ti AND [embase]/lim	85396
3	'nurse'/exp AND [embase]/lim	20665
4	formulary:ab,ti AND [embase]/lim	2263
5	'nurse'/exp AND 'prescription'/exp AND [embase]/lim	826
6	'nurse prescribing' AND [embase]/lim	72
7	#1 AND #2 AND [embase]/lim	2777
8	#3 AND #4 AND [embase]/lim	31
9	#5 OR #6 OR #7 OR #8 AND [embase]/lim	3207

3207 references were included in the original literature list.

Search strategy NIVEL Catalogue dd. 04-01-2010

No.	Search query	Results
1	nurs* AND prescri*	43
2	nurs* AND formulary	1
3	nurs* AND drug prescription	2
4	nurse prescribing	29

After removing duplicates 42 references were included in the original literature list.

Search strategy PubMed dd. 22-12-2009

Search	Most Recent Queries	Results
#6	Search <b>nurs*</b> [tiab]	275043
#7	Search <b>prescri*</b> [tiab]	90279
#8	Search <b>"Nurses"</b> [Mesh]	59805
#9	Search <b>formulary</b> [tiab]	2213
#10	Search <b>"Nurses"</b> [Mesh] AND <b>"Drug Prescriptions"</b> [Mesh]	657
#11	Search <b>"nurse prescribing"</b>	307
#12	Search <b>#6 AND #7</b>	4306
#13	Search <b>#8 AND #9</b>	31
#14	Search <b>#10 OR #11 OR #12 OR #13</b>	4664

4664 references were included in the original literature list.

Search strategy Web of Science dd. 24-12-2009

No.	Search query	Results
1	TI=nurs*	75785
2	TI=prescri*	24110
3	TI=formulary	967
4	TS=(nurs* AND drug prescription)	372
5	TS="nurse prescribing"	132
6	#1 AND #2	349
7	#1 AND #3	7
8	#4 OR #5 OR #6 OR #7	721

721 references were included in the original literature list.

Total result of literature searches in databases: 10243 references.

## Websites

Name, link and date searched	Search strategy	Number of references found
Escriber.com <a href="http://www.escriber.com/view/o/index.html">http://www.escriber.com/view/o/index.html</a> 04-01-2010	Website was searched using basic search facilities. Search terms: 1. "nurse prescribing" 2. "independent (nurse) prescribing" 3. "autonomous prescribing" 4. "supplementary (nurse) prescribing" 5. "dependent (nurse) prescribing" 6. "collaborative prescribing" 7. "group protocols" 8. "patient group directions" 9. "nurse formulary"	N= 5 N= 3 - N= 4 - - - N= 2 - After removing duplicates 12 references were included in the original literature list
Google Scholar <a href="http://scholar.google.nl/">http://scholar.google.nl/</a> 05-01-2010	Website searched using basic search facilities. Search term: "nurse prescribing".	After removing duplicates 1000 references were included in the original literature list
Internurse.com <a href="http://www.internurse.com/">http://www.internurse.com/</a> 04-01-2010	Website was searched using advanced search facilities. Search terms: 1. "nurse prescribing" 2. "independent (nurse) prescribing" 3. "autonomous prescribing" 4. "supplementary (nurse) prescribing" 5. "dependent (nurse) prescribing" 6. "collaborative prescribing" 7. "group protocols" 8. "patient group directions" 9. "nurse formulary"	N >500 N= 382 N= 1 N= 339 N= 30 N= 1 N= 56 N= 183 N= 31 After removing duplicates 690 references were included in the original literature list.
Nurse Prescriber <a href="http://www.nurse-prescriber.co.uk/">http://www.nurse-prescriber.co.uk/</a> 04-01-2010	Website was manually searched.	After removing duplicates 78 references were included in the original literature list.

Websites - To be continued -

Name, link and date searched	Search strategy	Number of references found
Nursingtimes.net <a href="http://www.nursingtimes.net/">http://www.nursingtimes.net/</a> 04-01-2010	Website was searched using basic search facilities. Search terms: 1. "nurse prescribing" 2. "independent (nurse) prescribing" 3. "autonomous prescribing" 4. "supplementary (nurse) prescribing" 5. "dependent (nurse) prescribing" 6. "collaborative prescribing" 7. "group protocols" 8. "patient group directions" 9. "nurse formulary"	N= 118 N= 40 - N= 40 N= 2 - N= 10 N= 44 N= 2 After removing duplicates 162 references were included in the original literature list
Virginia Henderson International Nursing Library <a href="http://www.nursinglibrary.org/portal/main.aspx">http://www.nursinglibrary.org/portal/main.aspx</a> 24-12-2009	Website was searched using basic search facilities. Search terms: 1. "nurse prescribing" 2. "independent (nurse) prescribing" 3. "autonomous prescribing" 4. "supplementary (nurse) prescribing" 5. "dependent (nurse) prescribing" 6. "collaborative prescribing" 7. "group protocols" 8. "patient group directions" 9. "nurse formulary"	N= 52 N= 7 - - N= 9 N= 5 N= 129 N= 16 N= 7 After removing duplicates 185 references were included in the original literature list
World Health Organisation <a href="http://www.who.int/en/">http://www.who.int/en/</a> 18-01-2010	Website was searched using advanced search facilities. Search terms: 1. "nurse prescribing" 2. "independent (nurse) prescribing" 3. "autonomous prescribing" 4. "supplementary (nurse) prescribing" 5. "dependent (nurse) prescribing" 6. "collaborative prescribing" 7. "group protocols" 8. "patient group directions" 9. "nurse formulary"	N= 38 N= 12 - N= 4 - N= 1 N= 2 N= 1 - After removing duplicates 32 references were included in the original literature list
Total result of literature searches in websites: 2159 references.		
Literature searches in databases:	N= 10243 references	
Literature searches in websites:	N= 2159 references	
Expert advice:	N= 3 references	
<b>Total result literature searches:</b>	<b>N = 12405 references</b>	

### Additional file 3.2 Characteristics of included publications

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Allsop [21]	2005	The United Kingdom	Supplementary prescribing in mental health and learning disabilities	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Asher [22]	2005	New Zealand	The initiative to extend prescribing rights	Independent nurse prescribing	FORC, EDUC, PROR
Astles [23]	2006	The United Kingdom	The benefits to older people in a hospital setting through extended nurse prescribing.	Independent nurse prescribing	FORC, LEGL, PROR
Baird [24]	2005	The United Kingdom	The forms of prescribing and administration of medication for non-medical staff.	Independent and supplementary nurse prescribing, and patient group directions	FORC, LEGL, EDUC
Ball [5]	2009	Australia, Canada, Ireland, Netherlands, New Zealand, Spain, Sweden, the UK, the USA	The worldwide developments in nurse prescribing policy and practice	Independent and supplementary nurse prescribing, and patient group directions	FORC, LEGL, EDUC, PROR
Barlow, Magorrian, Jones <i>et al.</i> [25]	2008	The United Kingdom	Experiences of implementing nurse prescribing in a specialist dementia service.	Supplementary nurse prescribing	FORC, LEGL, EDUC
Barrowman [26]	2007	The United Kingdom (Northern Ireland)	The implementation of nurse prescribing in Northern Ireland.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Beckwith, Franklin [27]	2007	The United Kingdom	Practical guidance on all aspects of prescribing	Independent and supplementary nurse prescribing, and patient group directions	FORC, LEGL, EDUC, PROR

Additional file 3.2 - To be continued -

<b>Author(s)</b>	<b>Year</b>	<b>Country/ setting</b>	<b>Focus of publication</b>	<b>Model(s) of NP discussed</b>	<b>NP dimension(s) discussed</b>
Beekman, Patterson [120]	2003	New Zealand, Australia	The drivers behind changes in nursing work and in particular nurse prescribing	Independent nurse prescribing	FORC, LEGL, EDUC
Berry, Courtenay, Bersellini [121]	2006	The United Kingdom, Sweden	Attitudes towards and information needs in relation to supplementary prescribing	Independent and supplementary nurse prescribing	FORC, LEGL
Berry, Dahl [28]	2007	The USA	Prescriptive authority of APNs in the USA	Independent nurse prescribing	FORC, LEGL, EDUC
Betts, Burgess [29]	2006	The United Kingdom	The evaluation of the first e-learning nurse prescribing course in England.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR
Birkholz, Walker [30]	1994	The USA (Alaska, New Mexico)	The scope of practice and prescriptive privileges of Nurse Practitioners	Independent nurse prescribing	FORC
Bowden [31]	2005	The United Kingdom	The experiences of nurse prescribing by a group of district nurses working within one of the UK pilot sites.	Independent and supplementary nurse prescribing	FORC, LEGL
Bradley, Nolan [32]	2005	The United Kingdom	The issues around non-medical prescribing that are currently prominent within mental health teams.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Bradley, Campbell, Nolan [33]	2005	The United Kingdom	The professional background and reasons for choosing to become nurse prescribers of recently qualified nurse prescribers.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Bradley, Blackshaw, Nolan [34]	2006	The United Kingdom	Nurse lecturers' experiences of delivering nurse prescribing courses.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC

Additional file 3.2 - To be continued -

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Bradley, Hynam, Nolan [35]	2007	The United Kingdom	The description, rating and safety of prescribing by recently qualified nurse prescribers.	Independent and supplementary nurse prescribing	FORC, LEGL
Bradley, Wain, Nolan [36]	2008	The United Kingdom	Why some nurses put their prescribing role in practice and others do not.	Independent and supplementary nurse prescribing	FORC
Bramley [37]	2006	The United Kingdom	The strategic approach to be taken by managers when identifying future nurse prescribers.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Bray, Dawson, Gibson <i>et al.</i> [38]	2009	The United Kingdom	The support and informing of nurses in critical care currently undertaking prescribing and those who are intending to prescribe.	Independent and supplementary nurse prescribing, and patient group directions	FORC, LEGL, EDUC
Brimblecombe, Parr, Gray [39]	2005	The United Kingdom	Development of new ways of working for mental health nurses	Supplementary nurse prescribing and patient group directions	FORC, LEGL, EDUC
Brookes, Smith [40]	2006	The United Kingdom	Non-medical prescribing in health care practice	Independent and supplementary nurse prescribing, and patient group directions	FORC, LEGL, EDUC, PROR
Buchan, Calman [6]	2004	Australia, Canada, New Zealand, Sweden, the UK, the USA	A review of current nurse prescribing practices	Independent and supplementary nurse prescribing, and patient group directions	FORC, LEGL, EDUC, PROR

Additional file 3.2 - To be continued -

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Bullough [41]	1983	The USA	The prescribing authority for nurses in American states	Independent nurse prescribing	FORC
Camp [42]	2008	The United Kingdom (Scotland)	The implementation process of the public policy of nurse prescribing from a Scottish perspective.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR
Carey, Courtenay, Burke [43]	2007	The United Kingdom	The prescribing practices of nurses who prescribe for patients with skin conditions and related facilitating and inhibiting factors.	Independent and supplementary nurse prescribing	FORC, LEGL
Carey, Stenner, Courtenay [45]	2009	The United Kingdom	The views of children's nurses on the adoption of the prescribing role in their practice.	Independent and supplementary nurse prescribing	FORC, LEGL
Carey, Courtenay [44]	2010	The United Kingdom	The pharmaceutical knowledge and provision of CPD to nurses who prescribe for patients with diabetes.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Chaston, Seccombe [122]	2009	The UK, New Zealand	The difference in educational preparation and context with regards to nurse prescribing between New Zealand and the UK.	Independent and supplementary nurse prescribing	FORC, EDUC
Cooper, Anderson, Avery <i>et al.</i> [123]	2008	The UK, the USA	Reviewing the literature on nurse and pharmacist SP to inform further research, policy and education.	Supplementary nurse prescribing	FORC, LEGL, EDUC
Cooper, Guillaume, Avery <i>et al.</i> [46]	2008	The United Kingdom	The developments and stakeholder interests of non medical prescribing.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR

Additional file 3.2 - To be continued -

<b>Author(s)</b>	<b>Year</b>	<b>Country/ setting</b>	<b>Focus of publication</b>	<b>Model(s) of NP discussed</b>	<b>NP dimension(s) discussed</b>
Cooper, Anderson, Avery <i>et al.</i> [47]	2008	The United Kingdom	The views of stakeholders involved in SP on benefits, facilitators, challenges, and safety and costs.	Independent and supplementary nurse prescribing and patient group directions	FORC, LEGL, EDUC, PROR
Courtenay, Carey [48]	2006	The United Kingdom	The advancement of nurse independent- and supplementary prescribing	Independent and supplementary nurse prescribing	LEGL, EDUC
Courtenay, Carey, Burke [124]	2006	The UK, Sweden, Canada, Australia, the USA	The prescribing practice and confidence to educate and access prescribing students of nurse prescribers.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Courtenay [49]	2007	The United Kingdom	The progression of nurse prescribing in the UK	Independent and supplementary nurse prescribing	LEGL, EDUC
Courtenay, Carey [125]	2007	The UK, Sweden, Australia, New Zealand, the USA	The preparedness of nurses to prescribe medicines for patients with diabetes.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR
Courtenay, Carey [126]	2008	The UK, Sweden, Australia, Canada, the USA	The prescribing practices of nurse independent prescribers caring for patients with diabetes	Independent and supplementary nurse prescribing	LEGL, EDUC
Courtenay [50]	2008	The United Kingdom	Recent policy changes surrounding nurse prescribing and specifically changes pertinent to community nurses	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR
Courtenay [52]	2009	The United Kingdom	Overview of nurse prescribing and the required education and training	Independent nurse prescribing	FORC, LEGL, EDUC

Additional file 3.2 - To be continued -

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Courtenay, Carey [51]	2009	The United Kingdom	Views of doctors and clinical leads on nurse prescribing by children's nurses	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Courtenay, Stenner, Carey [53]	2009	The United Kingdom	The views of doctors and nurses who care for people with diabetes about the prescribing programme.	Independent and supplementary nurse prescribing	LEGL, EDUC
Craig [54]	1996	The USA	The prescriptive authority for nurse practitioners	Impendent nurse prescribing	FORC
Creedon, O'Connell [55]	2009	Ireland	The introduction of nurse prescribing to the Irish setting.	Independent and supplementary nurse prescribing	FORC, EDUC, PROR
Culley [56]	2005	The United Kingdom	Current prescribing options for nurses	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Daly [57]	2006	The United Kingdom	The policies that led to developments in non-medical prescribing and implications for practice.	Independent and supplementary nurse prescribing	LEGL, EDUC
David, Brown [127]	1995	Sweden, the UK	The Swedish nurse prescribing system	Independent nurse prescribing	FORC, LEGL, EDUC
Davis, Drennan [128]	2007	The UK, the USA, New Zealand, Australia	The prescribing behaviours of community-based nurses and general practitioners.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR
Donato [58]	2009	The Netherlands	Nurse practitioners in the Netherlands.	Supplementary nurse prescribing	FORC, LEGL
Dragon [129]	2008	Australia, New Zealand	The prescribing patterns of advanced practitioners and why many are not working to capacity.	Independent nurse prescribing	LEGL, PROR

Additional file 3.2 - To be continued -

<b>Author(s)</b>	<b>Year</b>	<b>Country/ setting</b>	<b>Focus of publication</b>	<b>Model(s) of NP discussed</b>	<b>NP dimension(s) discussed</b>
Durand [130]	1998	The UK, the USA	The restriction on role development of the ENP	Independent nurse prescribing	FORC
Elsom, Happell, Manias [131]	2009	Australia, the USA	The standard of care provided by nurse practitioners and medical practitioners.	Independent nurse prescribing	FORC, LEGL, EDUC
Evans [132]	2009	The UK and the USA	The historical context of mental health nursing and its relationship to nurse prescribing.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Faucher [59]	1992	The USA	The legal avenues used by nurse practitioners to obtain prescriptive authority	Independent nurse prescribing	FORC
Fisher [60]	2005	The United Kingdom	The impact of nurse prescribing on the relation- ships between prescribers, nurses, doctors, pharmacists, patients and carers.	Independent nurse prescribing	FORC, LEGL, EDUC
Forchuk, Kohr [61]	2009	Canada	The role of prescriptive authority for nurses within Canada	Independent and supplementary nurse prescribing, patient group directions	FORC, LEGL
Ford, Otway [62]	2008	The United Kingdom	The need for continuing professional development in the area of prescribing	Independent and supplementary nurse prescribing	FORC
Gallagher [63]	2006	The United Kingdom	The anticipated benefits of prescribing changes for patients receiving treatment for substance misuse.	Independent and supplementary nurse prescribing	LEGL, EDUC
Gilmour, Bickford [64]	2007	The United Kingdom	The development of patient group directions and independent and supplementary prescribing.	Independent and supplementary nurse prescribing, patient group directions	FORC, LEGL, EDUC, PROR

Additional file 3.2 - To be continued -

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Goswell, Siefers [65]	2009	The United Kingdom	The experiences of ward-based nurse prescribers regarding the use of non-medical prescribing with the open formulary	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR
Grassby [66]	2005	The United Kingdom	The prescription of controlled drugs.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Gray, Parr, Brimblecombe [67]	2005	The United Kingdom	The current activities and attitudes regarding supplementary nurse prescribing in psychiatric settings.	Supplementary nurse prescribing	FORC, EDUC
Green, Westwood, Smith <i>et al.</i> [68]	2009	The United Kingdom	The provision of continued professional development for non-medical prescribers.	Independent and supplementary nurse prescribing	FORC, LEGL
	2009	The United Kingdom	The safety and efficacy of nurse independent prescribing in inflammatory bowel disease.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR
Greveson [69]	2006	The United Kingdom	Extension of the right to prescribe controlled drugs to independent, supplementary nurse prescribers	Independent and supplementary nurse prescribing, patient group directions	LEGL
Griffith [70]	2007	The United Kingdom	The legal requirements for the prescribing and administration of medicines.	Independent and supplementary nurse prescribing, patient group directions	LEGL, EDUC, PROR
Griffith [71]	2007	The UK and the USA	The skills of prescribing and clinically assessing patients.	Independent nurse prescribing	FORC, LEGL

Additional file 3.2 - To be continued -

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Haidar [133]	2005	The United Kingdom	Supplementary prescribing for nurses.	Independent and supplementary nurse prescribing, patient group directions	LEGL, EDUC, PROR
Hall [72]	2006	The United Kingdom	The barriers that could either prevent community nurses from prescribing or reduce the number of times a nurse might prescribe.	Independent and supplementary nurse prescribing	FORC, LEGL
Hall, Cantrill, Noyce [73]	2009	The USA	Successful advocating of nurses for legislative reforms in Pennsylvania	Independent nurse prescribing	FORC
Hansen-Turton, Ritter, Valdez [74]	1989	The USA	The historical development of medical prescriptive authority	Independent nurse prescribing	FORC
Harkless [75]	2006	The UK and the USA	The clinical practice and educational preparation for prescriptive authority for nurses in US centres.	Independent nurse prescribing	FORC, LEGL, EDUC
Hemingway, McAllister, Bailey <i>et al.</i> [134]	2009	The United Kingdom	Historical overview of- and the growth of mental health nurse prescribing in the UK.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Hemingway, Ely [76]	2006	The United Kingdom	The 'All Wales' Supplementary Prescribing training course	Independent and supplementary nurse prescribing	FORC, EDUC, PROR
Hinchliffe [77]	2007	The United Kingdom	The legal options available for nurses to supply and administer medicines.	Independent and supplementary nurse prescribing, patient group directions	EDUC, LEGL

Additional file 3.2 - To be continued -

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Hobden [78]	2009	The Netherlands	The transfer of management of type 2 diabetes from an internist to a nurse specialised in diabetes	Supplementary nurse prescribing	LEGL
Houweling, Kleefstra, van Hateren <i>et al.</i> [119]	2004	New Zealand	The introduction of nurse prescribing in New Zealand	Independent nurse prescribing	FORC, EDUC, PROR
Hughes, Lockyer [79]	2008	New Zealand	The conditions and forces in play in the development of advanced nursing practice in New Zealand.	Independent nurse prescribing	FORC
Jacobs, Boddy [80]	1999	The United Kingdom	The implementation and future of nurse prescribing	Independent and supplementary nurse prescribing, patient group directions	FORC, LEGL, EDUC, PROR
Jones [85]	2005	The UK and the USA	Supplementary nurse prescribing and it's potential application in a number of mental health settings.	Independent and supplementary nurse prescribing, patient group directions	FORC, LEGL, EDUC, PROR
Jones, Jones [135]	2006	The United Kingdom	Perceptions of nurses and psychiatrists concerning supplementary prescribing on acute psychiatric wards.	Independent and supplementary nurse prescribing, patient group directions	FORC
Jones [81]	2006	The United Kingdom	Impact of supplementary prescribing on relationships between nurses and psychiatrists	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Jones [82]	2008	The United Kingdom	The implementation of independent nurse prescribing in mental health settings	Independent and supplementary nurse prescribing	FORC, LEGL

Additional file 3.2 - To be continued -

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Jones [83]	2009	The United Kingdom	The development of a prescribing role for acute care nurses.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Jones [84]	1992	The USA	The first 20 years of nurse practitioner literature	Independent nurse prescribing	FORC
Koch, Pazaki, Campbell [86]	2007	The UK and the USA	The prescribing competencies and standards of independent nurse prescribers.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR
Latter, Mabel, Myall <i>et al.</i> [137]	2007	The United Kingdom and Sweden	Independent nurse prescribers' education and continuing professional development.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Latter, Mabel, Myall <i>et al.</i> [136]	2008	The United Kingdom	The safety and quality of independent nurse prescribers' current practice.	Independent nurse prescribing	FORC
Latter [87]	2008	Australia	The development of an internship model for nurse practitioners.	Independent nurse prescribing	FORC, EDUC
Lee, Fitzgerald [88]	2005	The United Kingdom	The introduction of nurse prescribing in a paediatric hospital setting.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR
Lilley, Marshall, McIntosh <i>et al.</i> [89]	2007	New Zealand, the UK and the USA	The educational framework for teaching pharmacology to prepare nurses for prescribing in New Zealand.	Independent nurse prescribing	FORC, LEGL, EDUC
Lim, Honey, Kilpatrick [138]	2008	Ireland and New Zealand	The attitudes and perceived barriers of Irish clinical nurse specialists to nurse prescribing.	Independent and supplementary nurse prescribing	EDUC, LEGL
Lockwood, Fealy [139]	2008	The UK, the USA and Australia	Evaluation of pharmacology education for nurse prescribing students.	Independent and supplementary nurse prescribing	FORC, EDUC

Additional file 3.2 - To be continued -

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Lymn, Bath-Hextall, Wharrad [140]	1998	New Zealand	The extension of prescribing rights to nurses	Independent nurse prescribing	FORC, EDUC
Manchester [90]	2005	The United Kingdom	The expanding role of the rheumatology nurse.	Independent and supplementary nurse prescribing, patient group directions	LEGL, EDUC, PROR
Meadows, Sheehan [91]	2007	The United Kingdom	The development of nurse prescribing within the cancer nursing team of a general hospital.	Independent nurse prescribing	FORC, LEGL, EDUC, PROR
O'Hare [92]	2005	The United Kingdom	Nurse prescribing in diabetes care.	Independent and supplementary nurse prescribing, patient group directions	FORC, EDUC
Padmore [93]	2009	The United Kingdom	The attitudes of psychiatrists and nurses regarding mental health nurse prescribing.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Patel, Robson, Rance <i>et al.</i> [94]	2010	The Netherlands	The experimental law concerning the independent authority of the Nurse Specialist in the Netherlands	Independent prescribing	FORC, LEGL, EDUC
Peet, van der [117]	2010	The Netherlands	The law concerning the prescriptive authority of nurses in the Netherlands	Supplementary prescribing	FORC, LEGL, EDUC
Peet, van der [118]	2007	The United Kingdom	Consultation on non-medical prescribing.	Independent and supplementary nurse prescribing	LEGL, EDUC, PROR
Peniston-Bird [95]	2003	The USA	The evolution of prescriptive authority for nurses in the United States	Independent nurse prescribing	FORC
Plonczynski, Oldenburg, Buck [96]	2006	The United Kingdom	The blockages, facilitating factors and current practice of nurse prescribing in Scotland.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC

Additional file 3.2 - To be continued -

<b>Author(s)</b>	<b>Year</b>	<b>Country/ setting</b>	<b>Focus of publication</b>	<b>Model(s) of NP discussed</b>	<b>NP dimension(s) discussed</b>
Pollock, Dudgeon [97]	2007	The United Kingdom	The opportunities and barriers to nurse prescribing for children's nurses, and the development of a training strategy.	Independent and supplementary nurse prescribing, patient group directions	FORC, LEGL
Pontin, Jones [98]	2006	The United Kingdom	The challenges influencing the development, implementation and effectiveness of nurse prescribing.	Independent and supplementary nurse prescribing	EDUC, PROR
Ring [99]	2009	The United Kingdom	The barriers to implementing mental health nurse independent prescribing .	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Ross [100]	2007	The United Kingdom	Challenges and opportunities of nurse prescribing in child and adolescent mental health services.	Independent and supplementary nurse prescribing	FORC, LEGL
Ryan [102]	2008	The United Kingdom	The prescribing practice of and views of specialist nurses working in cancer and palliative care on nurse prescribing training.	Independent and supplementary nurse prescribing	LEGL, EDUC
Ryan- Woolley, McHugh, Luker [101]	2008	The UK, Canada, the USA, Australia and New Zealand	To examine the development of advanced nursing practice globally.	Independent nurse prescribing and patient group directions	LEGL, EDUC
Sheer, Wong [141]	2005	The United Kingdom	The history of nurse prescribing in the UK and the most recent extension	Independent and supplementary nurse prescribing	FORC, LEGL
Shuttleworth [103]	2006	The United Kingdom	The development and content of a 'top-up' neuropharmacology module for mental health nurses.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC

Additional file 3.2 - To be continued -

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Skingsley, Bradley, Nolan [104]	2006	The United Kingdom	Suggestion of a CMP for community psychiatric nurses prescribing for elderly with mental health needs.	Independent and supplementary nurse prescribing, patient group directions	LEGL, EDUC
Snowden [105]	2006	The United Kingdom	The impact of mental health nurse prescribing	Independent and supplementary nurse prescribing	FORC
Snowden [106]	2008	The UK and the USA	The history of the regulation of medicines.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR
Snowden [142]	2007	New Zealand	The implementation of a prescribing practicum within a Master's degree in advanced nursing practice.	Independent nurse prescribing	FORC, EDUC
Spence, Anderson [107]	2008	The United Kingdom	Nurse prescribers' views on the role of inter-professional relationships and support for nurse prescribing in acute and chronic pain.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Stenner, Courtenay [108]	2009	The United Kingdom	Doctor and non- prescribing nurse views about nurse prescribing in dermatology.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Stenner, Carey, Courtenay [109]	2008	The United Kingdom	The expressed beliefs about the pharmacological knowledge of nurses in prescribing practice.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Strickland- Hodge [110]	1982	The USA	The prescriptive privileges of nurse practitioners in Utah	Independent nurse prescribing	FORC
Tarmina [111]	2007	Sweden	The analysis of adverse drug reaction reporting by nurses.	Independent nurse prescribing	FORC, LEGL, EDUC

Additional file 3.2 - To be continued -

Author(s)	Year	Country/ setting	Focus of publication	Model(s) of NP discussed	NP dimension(s) discussed
Ulfvarson, Mejyr, Bergman [112]	2007	The United Kingdom	The standards for- and numeracy skills of nurse prescribers.	Independent and supplementary nurse prescribing	LEGL, EDUC
Warburton, Kahn [113]	2005	The United Kingdom	The theory that underpins nurse prescribing	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC
Warner [114]	2009	Ireland	The views of community mental health nurses on nurse prescribing.	Independent and supplementary nurse prescribing	FORC
Wells, Bergin, Gooney <i>et al.</i> [115]	2005	The United Kingdom	Supplementary nurse prescribing for overactive bladder.	Independent and supplementary nurse prescribing	FORC, LEGL, EDUC, PROR

Dimensions of nurse prescribing being discussed:  
 internal and external forces related to the introduction of legal nurse prescribing (FORC);  
 legal conditions under which nurse prescribing of medicines will be or has been realized (LEGL);  
 educational conditions under which legal nurse prescribing of medicines will be or has been  
 realized (EDUC);  
 practical-organizational conditions under which legal nurse prescribing of medicines will be or  
 has been realized (PROR)

Additional file 3.3 Results verification search with relevant stakeholders in Western European and Anglo-Saxon countries

Country	Stakeholders	Results
Australia	Australian Nursing Federation, Western Australian Department of Health	Confirmation received that nurses are allowed to prescribe medicines in all States and Territories in Australia.
Austria	Österreichischen Gesundheits- und Krankenpflegeverband, Federal Ministry of Health	Confirmation received that nurses are not allowed to prescribe medicines and no implementation process is being initiated.
Belgium	Association Belge des Syndicats Médicaux, FPS Public health-General Directory Healthcare Facilities Organization	Confirmation received that nurses are not allowed to prescribe medicines and no implementation process is being initiated.
Canada	Canadian Nurses Association, Canadian Medical Association	Confirmation received that nurses are allowed to prescribe medicines in all Canadian jurisdictions.
Denmark	Danish Nurses' Organization, Danish Medical Association, National Board of Health	Confirmation received that nurses are not allowed to prescribe medicines and no implementation process is being initiated, although the Danish Nurses' Organization is currently lobbying to gain limited prescription rights for relevant groups of nurses.
Finland	Finnish Nurses Association	In contradiction to our literature findings, we were informed that an implementation process of legal nurse prescribing is currently being rolled out in Finland to allow a specific category of nurses the right to prescribe a limited number of medicines.
France	IRDES- Institute for Research and Information in Health Economics	Confirmation received that nurses are not allowed to prescribe medicines and no implementation process is being initiated.
Germany	German Nurses Association, Bundesärztekammer, Bundesministerium für Gesundheit	Confirmation received that nurses are not allowed to prescribe medicines and no implementation process is being initiated.
Iceland	Icelandic Nurses Association, Ministry of Health	Confirmation received that nurses are not allowed to prescribe medicines and no implementation process is being initiated.
Ireland	Irish Nurses and Midwives Organisation, Irish Medical Organisation, Department of Health and Children	Confirmation received that nurses are allowed to prescribe medicines within Ireland.
Italy	Ministero della Sanita	Confirmation received that nurses are not allowed to prescribe medicines and no implementation process is being initiated.
Luxembourg	Luxemburg Nurses Association, Ministry of Health	Confirmation received that nurses are not allowed to prescribe medicines and no implementation process is being initiated.
Netherlands	Verpleegkundigen & Verzorgenden Nederland, Koninklijke Nederlandsche Maatschappij tot bevordering der Geneeskunst	Confirmation received that legal nurse prescribing is being implemented.

Additional file 3.3 .- To be continued -

Country	Stakeholders	Results
New Zealand	New Zealand Nurses Organisation, New Zealand Medical Association, Ministry of Health	Confirmation received that nurses are allowed to prescribe medicines within New Zealand.
Norway	Norwegian Nurses Organisation, Ministry of Health and Care Services	We were informed that Public Health Nurses for Children and Young Adults are allowed to prescribe the birth control pill for girls and young women (16 to 19 years old), for which they must complete a certified course. Moreover, over the last year there has been discussion about the establishment of a Nurse Practitioner Master program with possible inclusion of prescribing of medicines.
Portugal	Nursing Board of the Ordem dos Enfermeiros, Portuguese Medical Association	Confirmation received that nurses are not allowed to prescribe medicines and no implementation process is being initiated.
Spain	Universidad de Barcelona	Confirmation received that nurse prescribing is in a regulatory process in Spain.
Sweden	Swedish Nurses Association, Swedish Medical Association, Socialdepartementet	Confirmation received that certain nurses are allowed to prescribe medicines within Sweden.
Switzerland	Swiss Nursing Association (SBK-ASI), FMH Verbindung der Schweizer Ärztinnen und Ärzte	Confirmation received that nurses are not allowed to prescribe medicines and no implementation process is being initiated.
United Kingdom	The Royal College of Nursing, Department of Health	Confirmation received that nurses are allowed to prescribe medicines within the United Kingdom.
United States of America	American Nurses Association	Confirmation received that nurses are allowed to prescribe medicines within the United States of America.

Additional file 3.4 Description of nurse prescribing in nine Western European and Anglo-Saxon countries according to core themes

**Australia**

**Description of nurse prescribing in Australia**

*Year of introduction:*

In Australia, the first group of nurses started prescribing in the year 2000 [5,129].

*Forces which led to introduction of nurse prescribing:*

Predominantly because of a shortage of doctors in rural areas. Nurse prescribers had to meet the medication needs of patients in these remote areas [5,120,124,125,131]. Followed by a desire to develop the nurse practitioner role [88,131].

*Legal conditions:*

Regulated at: State/territory level [5,6,129,131]

Prescriptive authority:

Independent prescriptive authority: Some nurse practitioners have independent prescriptive authority [6].

In other states, nurses prescribe under standing directives put in place by a doctor [6,128].

Protocols/formularies in place: In the state South Australia, every nurse practitioner has their own individual formulary of medicines from which to prescribe [129]. Other Australian states have general limited formularies for nurse prescribers in place [6,131], and a number of Australian states such as New South Wales and Queensland use protocols to facilitate nurses' prescriptions [129].

To whom can nurses prescribe: -

Formal responsibilities: Nurses must take full responsibility for patient's treatment [5].

*Educational conditions:*

Place within educational system: Prescribing training is part of general Nurse Practitioner curricula[5,6,88,131].

Level of prescribing training: Master level [5,6,88,131]

Admission criteria: In the state Victoria admission criteria to Victoria's NP programme are a Bachelor of Nursing degree, at least 2 years of professional nursing experience, demonstration of advanced clinical practice, research, and leadership, usually requiring many years of experience and additional postgraduate qualifications in a particular area of nursing speciality [131].

Content prescribing training: Pharmacological and therapeutical treatment elements, legal and ethical considerations of prescribing, focus on taking full responsibility for patient's treatment [5].

*Practical-organizational conditions:*

Registration: -

Continuing professional development: -

Financial issues: -

## Canada

### Description of nurse prescribing in Canada

#### *Year of introduction:*

In Canada, the first group of nurses started prescribing in the early 1990s [6].

#### *Forces related to introduction:*

Nurse prescribing was introduced to meet the health service needs of patients in remote and isolated areas and to address the general shortage of doctors, particularly in remote areas. In addition, illegal prescribing by community health nurses could be formally recognized [6,61,124].

#### *Legal conditions:*

Regulated at: Provincial/territorial level [5,6]

Prescriptive authority:

Independent prescriptive authority: In some states, nurses have independent prescriptive authority [5,6,61].

In other states, medical directions offer the opportunity to develop protocols that allow nurses to prescribe medicines [5,61].

Protocols/formularies in place: A number Canadian provinces use protocols to facilitate nurses' prescriptions, others use formularies [5,6,61].

To whom can nurses prescribe: In the province Ontario nurses can only prescribe in primary care, long-term care and outpatient clinics [61].

Formal responsibilities: In the province British Columbia registered nurses who initiate medicines are 'fully responsible and accountable' for their prescription [61].

#### *Educational conditions:*

Place within educational system: Part of general Nurse Practitioner education [5,6,141]

Level of prescribing training: Most educational programmes for nurse practitioners are at postgraduate level [5,141]

Admission criteria: -

Content prescribing training: -

#### *Practical-organizational conditions:*

Registration: -

Continuing professional development: -

Financial issues: -

## **Ireland**

### **Description of nurse prescribing in Ireland**

#### *Year of introduction:*

In Ireland, the first group of nurses started prescribing in the year 2007 [5,55,115,139].

#### *Forces which led to introduction of nurse prescribing:*

The striving for improvements in service delivery, integrated care, more cost-effectiveness, and to deploy the education and expertise of nurses more efficiently. This in the light of an ageing population [5,55,115].

#### *Legal conditions:*

Regulated at: National level

Prescriptive authority: Independent [5,139]

Protocols/formularies in place: Nurse prescribers may independently prescribe from an open formulary specific to their field of clinical practice [5,139].

To whom can nurses prescribe: -

Formal responsibilities: -

#### *Educational conditions:*

Place within educational system: Prescribing courses are offered on a stand-alone basis, i.e. they are not part of some regular nursing curriculum [5,55,139].

Level of prescribing training: Level 8 in the Irish education system, comparable to Honours Bachelor Degree level [5].

Admission criteria: Applicants must have a minimum of three years clinical experience post-registration, be competent to study at graduate level and appear on the live register of An Bord Altranais [5].

Content prescribing training: The three core modules are: Professional accountability in nurse and midwife prescribing, drug action and therapeutics, and systematic assessment and evaluation in patient care. There is also a practicum component [5].

#### *Practical-organizational conditions:*

Registration: Nurse prescribers must be registered with the national nursing board An Bord Altranais [5,115,139].

Continuing professional development: The responsibility for continuing professional development lies with each health service provider and the individual nurse prescriber and is focused on maintaining competence and promoting evidence based learning [5].

Financial issues: -

## Netherlands

### Description of nurse prescribing in the Netherlands

#### *Year of introduction:*

In the Netherlands, the first group of nurses is expected to start prescribing in the near future [5,117,118].

#### *Forces which led to introduction of nurse prescribing:*

The striving for a more cost-effective healthcare system, the ageing of the population and a serious shortage of specialists and inner-city physicians led to the (further) development of the nurse practitioner role [58]. Developments in this role and the role of specialist nurses prompted the nurse prescribing initiative in the Netherlands [5]. Moreover, it is known that nurses in practice are already prescribing medicines for decades, which is illegal, and legalizing nurse prescribing can put a stop on this undesirable situation [118]. Furthermore, the government is striving for task reallocation in the health care sector [117,118].

#### *Legal conditions:*

Regulated at: National level

Prescriptive authority:

Independent: for Nurse Specialists [117]

Form resembling supplementary prescribing: for specific other categories of specialist nurses, most probably nurses specialized in caring for patients with diabetes, lung diseases and cancer [118].

Protocols/formularies in place: Protocols will in the future be used to facilitate nurses' prescriptions [58,119,118].

To whom can nurses prescribe: -

Formal responsibilities: -

#### *Educational conditions:*

Place within educational system: For Nurse Specialists, it is anticipated that prescribing will become an obligatory component of the Masters programme of Advanced Nursing Practice [5].

Level of prescribing training: Nurse Specialists are prepared at Master level [5,117].

Admission criteria: -

Content prescribing training: The course for Nurse Specialists has been developed based on the programme used for GPs in the Netherlands [5].

#### *Practical-organizational conditions:*

Registration: For Nurse Specialists, registering their title shows their prescriptive authority (during the experimental period of maximally 5 years) [117].

Prescriptive authority for specialist nurses will be linked to their possession of an educational certificate/qualification approved by the Minister of Health. Nurses can then request the Minister for a special endorsement in their BIG registration (registration system for health professionals kept up by the Ministry of Health) which shows their prescribing qualification [118].

Continuing professional development: -

Financial issues: -

## **New Zealand**

### **Description of nurse prescribing in New Zealand**

#### *Year of introduction:*

In New Zealand, the first group of nurses started prescribing in the year 2001 [5,6,122,138].

#### *Forces which led to introduction of nurse prescribing:*

Nurse prescribing was introduced to meet the medication needs of patients in remote areas, improve patient care, increase the cost-effectiveness of the healthcare system, and make better use of the skills of the highly educated nursing workforce [5,6,22,79,80,90,107,120,122,125].

#### *Legal conditions:*

Regulated at: National level

Prescriptive authority: Independent [5,6].

Protocols/formularies in place: New Zealand has general limited formularies for nurse prescribers in place [5,6,90,125].

To whom can nurses prescribe: Prescriptive authority was for a long time only granted to nurses working in specific areas of care [90,125,138,139] but this recently appears to have expanded to include the whole NP scope of practice [5].

Formal responsibilities: -

#### *Educational conditions:*

Place within educational system: Preparation courses for nurse prescribing are offered within a Masters programme for advanced nursing practice or as a stand-alone Post Graduate Diploma (Prescribing) for nurses who already completed a Masters [5,6,22,27,40,49,107,138].

Level of prescribing training: Master level [5,6,22,27,40,49,107,138].

Admission criteria: Nurses must have at least 4 years of clinical experience in their speciality area [107,122].

Content prescribing training: Core modules are: advanced health assessment, physiology and pathophysiology, pharmacology, pharmacodynamics, pharmacokinetics, clinical decision-making skills and differential diagnosis. There is also a prescribing practicum. The mentor prescriber would also be a New Zealand practitioner in the same clinical area as the nurse [5,122,138].

#### *Practical-organizational conditions:*

Registration: Nurse prescribers must be registered with the New Zealand Nursing Council [5,6,79]

Continuing professional development: The New Zealand Nursing Council developed a comprehensive framework including requirements for ongoing competence. Nurses must provide evidence of the maintenance of their competencies in order to gain certification renewal [5,79].

Financial issues: NPs have prescriber numbers so if a NP prescribes a drug the cost to the patient is the same as if a doctor prescribes [129].

## Spain

### **Description of nurse prescribing in Spain**

#### *Forces which led to introduction of nurse prescribing:*

The Spanish General Council of Nursing was very active in the passing of the legislation to authorise nurses to “continue doing what they are already doing in the course of their daily practice”, i.e. to legalize the practices of nurses who were already prescribing for a long time [5].

#### *Legal conditions:*

Regulated at: The Medicine Law needs to be amended at national level to legally authorise nurse prescribing. However, health systems are being managed at a regional level by regional health ministers. The Regional Government of Andalusia has recently taken the initiative of leading the regulation of nurse prescribing [5].

Prescriptive authority: The goal is to achieve the following four forms of prescriptive authority for nurses [5]:

In accordance with institutional protocols and standardized health care plans.

In accordance with protocols containing treatment based on personalized medical prescriptions (follow-up of chronic patients).

In accordance with protocols relating to advanced nursing practice (specialities).

Independent prescribing by means of a nurse dispensing order (prescription) to dispense all non-prescription medicines and health care products.

Protocols/formularies in place: -

To whom can nurses prescribe: -

Formal responsibilities: -

#### *Educational conditions:*

Place within educational system: -

Level of prescribing training: -

Admission criteria: -

Content prescribing training: -

#### *Practical-organizational conditions:*

Registration: -

Continuing professional development: -

Financial issues: -

## Sweden

### **Description of nurse prescribing in Sweden**

#### *Forces which led to introduction of nurse prescribing:*

Nurse prescribing was introduced to offer patients, especially in remote areas, quicker and better access to medicines, reduce the workload of doctors, improve service to clients and make sure that primary care was given by an appropriate mix of health professionals [5,6,112,121,124,125,127].

#### *Legal conditions:*

Regulated at: National level

Prescriptive authority: Independent

Protocols/formularies in place: General limited formularies are in place for nurse prescribers [5,6,112,125-127].

To whom can nurses prescribe: Only district nurses and nurses working in elderly care may prescribe for 60 conditions [5,6,85,125,127,136].

Formal responsibilities: Nurses are not expected to make a decision about differential diagnosis before prescribing [127].

#### *Educational conditions:*

Place within educational system: Prescribing training is part of the Primary Health Care Specialist Nursing programme, undertaken by all district nurses [5].

Level of prescribing training: The Primary Health Care Specialist Nursing programme is offered at Master level.

Admission criteria: Nurses must be under 60 [5,127].

Content prescribing training: Pharmacology and drug treatment course [5].

#### *Practical-organizational conditions:*

Registration: -

Continuing professional development: -

Financial issues: -

## United Kingdom

### Description of nurse prescribing in the United Kingdom

#### *Year of introduction:*

In the United Kingdom, the first group of nurses started prescribing nationally in the year 1998 [5,6,25,27,40,42,46,56,57,62,67-69,72,76,78,85,98,100,101,104,114,116,122,135]

#### *Forces which led to introduction of nurse prescribing:*

The effort to make better use of nurses' skills and knowledge, and to improve the use of both professional and patients' time. Provide a more streamlined, accessible and flexible health service, with more team working, and reduce waiting times

[21,25,26,29,31,32,34-37,39,42,46,47,51,52,62,64,67,69,76,82-84,87,89,92,93,100,102,103,106,109,116,124,125,130,132-134,137]

#### *Legal conditions:*

Regulated at: National level

Prescriptive authority:

Independent prescriptive authority (IP)

Supplementary prescriptive authority (SP)

Community practitioner prescriptive authority (CP)

Use of Patient Group Directions (PGDs)

Protocols/formularies in place:

IP: independent prescribers can prescribe from the entire British National Formulary (BNF), including unlicensed medicines and some controlled drugs [5,24,26,35,44-46,49,51-53,63,65,68,69,76,78,83,84,92,94,100-103,105,108,109,113,126,128,136,137,139].

SP: Supplementary prescribers in the UK can prescribe from the entire BNF including all controlled drugs, provided they are listed in a clinical management plan agreed by the independent prescriber, nurse and patient [5,21,24,26,27,35,38,40,43-45,48-53,63,76,78,82,95,100,101,108,114,123-126].

CP: Community practitioner nurse prescribers in the UK however, have their own more limited formulary to prescribe from [5,27].

To whom can nurses prescribe: Community practitioner nurse prescribers can prescribe for a number of common conditions, but both independent- and supplementary nurse prescribers can prescribe for any medical condition or patient group within their clinical competence [5,25,27,35,40,50,52,63,68,69,71,78,84,89,92,94,95,100-102,105,109]. PGDs can in principle also be drawn up for any medical condition, but should be reserved for those situations where it offers 'an advantage for the patient without compromising patient safety' [40,72].

Formal responsibilities:

IP & CP: Independent nurse prescribers and qualified community nurse prescribers are responsible for the clinical assessment and diagnosis of a patient and for decisions about the clinical management required, including prescribing [27,40,47,48,51,56,69,72,78,83,84,89,92,100,102,108-110,114,124-126,136-138].

SP: Supplementary prescribers are responsible for the continuing care of a patient, including prescribing, whilst the collaborating independent prescriber shares the responsibility for prescribing and holds full responsibility for the assessment and diagnosis of a patient [25,40,47-49,51,56,63,69,72,78,84,100,103,123,124,135].

United Kingdom - To be continued -

*Educational conditions:*

Place within educational system:

IP & SP: Independent- and supplementary prescribing courses are combined into a 'dual qualification' and offered on a stand-alone basis, i.e. they are not part of some regular nursing curriculum [5,32,33,44,51,53,64,72,93,110,116,122-126].

CP: Training to prescribe from the British Nurse Prescribers Formulary for Community Practitioners is incorporated into Specialist Practitioner Programmes [5,6,22,27,40,49,107,140].

PGDs: No specific training is required for nurses using PGDs, although most individual Trusts provide some in-house training [24,39,40,105].

Level of prescribing training: IP & SP: prescribing courses are taught at undergraduate level 3 (degree level) [5,6,24,27,29,37,48,50,52,56,60,63-65,69,72,76,77,84,89,91,95,99,109,116,122-125,137,140,142].

Admission criteria: Three years of clinical experience are required, of which the last year must be in the clinical field in which they intend to practice [5,29,42,53,71,84,108,109,124,126,137,140]. Another important requirement is nurses' ability to demonstrate clinical assessment and clinical decision making skills [37,38,42,53,65,84,95,99,137]. Additional prerequisites for potential nurse prescribers include nurses' ability to arrange a Designated Medical Practitioner (DMP) who will supervise them during their practice period and they must occupy a post in which nurse prescribing will enhance patient care [5,26,40,50,52,53,77,95,97,108,109,125].

Content prescribing training: IP & SP: Consultation skills and decision making, influence on and psychology of prescribing, clinical pharmacology including the effects of co-morbidity, evidence based practice and clinical governance, calculation skills, promoting medicines concordance, legal, policy and ethical aspects, professional accountability and responsibility, prescribing in a team context, prescribing in the public health context, influence of pharmaceutical industry [48-50,52,110,114,122,124,125,132,136].

*Practical-organizational conditions:*

Registration: Nurse prescribers must have an annotation on the Nursing and Midwifery Council (NMC) register as a nurse prescriber [5,22,23,29,38,42,71,77,85,91,92,95,116,142].

Continuing professional development: The responsibility nurses have in maintaining competence in prescribing falls into three areas: personal responsibility, employer responsibility and accessing CPD, the latter responsibility being a joint one between the nurse and the employer. CPD requirements are the same for independent, supplementary and community nurse prescribers. The NMC developed a guidance document and the National Prescribing Centre has produced a range of CD ROMs for nurse prescribers to support their continuing professional development (CPD). Nurses are responsible for remaining up-to-date with any changes in the prescribing initiative, including additions to their formularies [5,27,32,33,35,40,50,60,62,87,89,136,137].

Financial issues: Funding to undertake nurse prescribing training is made available from central government through local level organizations, such as workforce development confederations, strategic health authorities and local NHS Trusts [40,42,46,47,65,69,72]. Access to a prescribing budget needs to be created for nurse prescribers before they can perform their role [27,85].

## **United States of America**

### **Description of nurse prescribing in the United States of America**

#### *Year of introduction:*

In the United States of America, the first group of nurses started prescribing in the 1960s. [5,6,30,107,115,123,128,134,135,138].

#### *Forces which led to introduction of nurse prescribing:*

Nurse prescribing in the USA followed the development of the Advanced Practice Registered Nurse role [5,124]. The general ANP role, and hence prescriptive authority, was introduced to alleviate the shortages of medical practitioners in primary care and meet the medication- and healthcare needs of patients in remote areas [5,6,28,30,41,54,59,74,86,131,134,138]. Other incentives were the striving to increase the cost-effectiveness of the healthcare system [30,54,134], make better use of nurses skills [30,41,75,125,134] and legalise covert prescribing practices by nurses [75,96,111,130].

#### *Legal conditions:*

Regulated at: State level [5,6,28,85,125]

Prescriptive authority: In over half of the US states nurses have full independent prescriptive authority, whereas in other states mandatory collaboration with and/or supervision by a physician is required [5,6,28,54,59,75,96,124,135,137]

Protocols/formularies in place: A number of American states have limited formularies for nurse prescribers in place [5,6,28,85]. In other American states, for example Texas, nurses prescribe via protocols [28,133].

To whom can nurses prescribe: -

Formal responsibilities: In the state Massachusetts nurses assume responsibility for prescribing [134].

#### *Educational conditions:*

Place within educational system: Training for nurse prescribing is linked to educational preparation for nurse practitioner roles [5,124,134].

Level of prescribing training: In most states Master level [5,6,28,123,132,134,140,142].

Admission criteria: -

Content prescribing training: -

#### *Practical-organizational conditions:*

Registration: Nurse prescribers must register their qualification with their respective regulatory nursing bodies [134].

Continuing professional development: -

Financial issues: In several states of the U.S.A., the social welfare program Medicaid does not reimburse prescriptions written by nurses [135].

# 4

## **Nurse prescribing of medicines in Western European and Anglo-Saxon countries: a survey on forces, conditions and jurisdictional control**

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## **Abstract**

### **Background**

The number of Western European and Anglo-Saxon countries where nurses are legally allowed to prescribe medicines is growing. As the prescribing of medicines has traditionally been the task of the medical profession, nurse prescribing is changing the relationship between the medical and nursing professions.

### **Objectives**

To gain more insight into the forces that led to the introduction of nurse prescribing of medicines in Western European and Anglo-Saxon countries, as well as into the legal, educational and organizational conditions under which nurses prescribe in these countries. Moreover, this study sought to determine which consequences nurse prescribing has for the division of jurisdictional control over prescribing between the nursing and medical professions.

### **Design**

International survey.

### **Participants**

An email survey was sent to 60 stakeholders of professional nursing or medical associations or government bodies, at national, state or provincial level across ten Western European and Anglo-Saxon countries, namely Australia, Canada, Finland, Ireland, the Netherlands, New Zealand, Spain, Sweden, the United Kingdom and the United States of America.

### **Methods**

The survey addressed the reasons for the introduction of nurse prescribing and the conditions under which nurses are or will be prescribing medicines.

### **Results**

The response rate was 65% (n=39). It was shown that a diversity of forces led to the introduction of nurse prescribing, and respondents from nursing and medical associations and government bodies cited different forces as being important for the introduction of nurse prescribing. Representatives of nurses' associations oftentimes emphasized the medication needs of patients living in remote geographical areas, while representatives of medical associations more

often pointed to workforce shortages within the health care service. The conditions under which nurses prescribe medicines vary considerably, from countries where nurses prescribe independently to countries in which prescribing by nurses is only allowed under strict conditions and the supervision of physicians.

### **Conclusions**

Citing different forces as being important in the introduction of nurse prescribing can be conceived as a professional 'problem construction' in order to gain jurisdiction over the prescribing task. In most countries, nurses prescribe in a subordinate position and the jurisdiction over prescribing remains predominantly with the medical profession.

## **4.1. Introduction**

Nurse prescribing is a highly relevant issue in the current climate of cost containment and task substitution in health care. During the past decades, the number of countries where nurses are legally permitted to prescribe medication has grown considerably [1,2]. However, even though the term 'nurse prescribing' suffices as a descriptor term [3], the actual practice it refers to varies considerably, both within countries and internationally [4,5]. As a further growth of nurse prescribing can be anticipated, it is important to have a complete picture of nurse prescribing internationally, so as to inform future developments in this area.

Two crucial aspects in the organization of nurse prescribing are legislation and education [6], since these aspects determine who can prescribe and what can be prescribed. How legal and educational conditions translate into practice, is largely determined by the organizational conditions in place. Therefore, in describing nurse prescribing across Western European and Anglo-Saxon countries, this study focuses on the legal, educational and organizational conditions under which nurses prescribe.

## **4.2. Nurse prescribing models**

Despite the variety in nurse prescribing practices found internationally [3-5], three general models of nurse prescribing are usually distinguished in the literature. These prescribing models are useful in structuring the variety of legal, educational and organizational conditions under which nurses are prescribing internationally. Moreover, these models were used to structure our survey.

The two models most often discussed in the literature are independent nurse prescribing and supplementary nurse prescribing. Legally permitted and qualified independent prescribers are responsible for the clinical assessment of a patient, the establishment of a diagnosis and decisions about the appropriateness of a medication, treatment or appliance, including the issuing of a prescription [4,7-10]. Independent nurse prescribing usually takes place from a limited formulary – a list containing a limited and defined number of medicines that can be prescribed – or an open formulary.

Supplementary nurse prescribing is defined as a partnership between an independent prescriber – usually a doctor – and a nurse. After the initial

assessment and diagnosis of a patient's condition have been carried out by the independent prescriber, the nurse may prescribe from an open or limited formulary and will collaborate or consult with the independent prescriber before issuing the prescription, even though direct supervision is not required [4,7,10-13]. In the UK a third prescribing model is discerned, viz. community practitioner nurse prescribing, formerly known as district nurse and health visitor prescribing. Under this model district nurses and health visitors are allowed to prescribe independently, but only from their own specific formulary [14].

### **4.3. Theoretical background**

Traditionally, the task of prescribing medicines has been the sole domain of the medical profession [15-17]. With the development of nurse prescribing, doctors are confronted with a 'rival' profession in this domain. This has consequences for the relationship between the medical and nursing profession, in which for example a perceived change in power balance can occur [18]. After all, the introduction of nurse prescribing changes the division of jurisdiction between the medical and nursing profession, resulting in interprofessional competition over the prescribing task.

According to Abbott [19], competition between professions over the jurisdiction over a task, in this case the prescribing of medicines, is shaped by various 'internal' and 'external' forces. Abbott characterises internal forces as forces arising from within the professions themselves, and external forces as general social forces. An example of an external force that could possibly shape professional competition over prescribing rights is governmental striving for a more cost-effective healthcare system, whereas internal forces might be a shortage of doctors in the health workforce [20] or nurses' desire for more professional autonomy. Professions can use these internal and external forces to influence the outcomes of professional conflicts. Abbott states that by constructing problems in such a way that their knowledge is acknowledged as expert knowledge, professions can successfully claim jurisdiction over a task. Hence, in the case of nurse prescribing, naming certain internal or external forces can be seen as part of professional problem construction.

Professional competition can have various outcomes [19]. In general, all competing professions seek full jurisdiction over a task. Where nurses are able

to independently prescribe medicines, with a fair range of prescribing freedom concerning medicine choice, both the nursing and medical profession hold equal and full jurisdiction over prescribing, according to Abbott's classification. However, this is an exceptional case. Because 'there are only so many full jurisdictions to go around', most professional conflicts result in so-called 'limited jurisdictional settlements' [19]. These are alternatives to the situation in which one or more professions hold full jurisdiction over a task. In a jurisdictional settlement, professions share the jurisdiction over a task, whereby jurisdictional control is to a greater or lesser extent equally distributed between the professions, depending on the type of jurisdictional settlement concerned. Abbott discerns several possible jurisdictional settlements, such as: subordination, whereby an incumbent profession controls the division of labor for one or more subordinate groups; client differentiation, in which different segments of a profession serve different client groups and; a division of labor, in which the jurisdiction over a certain task is divided between professions into 'functionally interdependent but structurally equal parts'. Supplementary prescribing can be considered a 'division of labor' in Abbott's terms, because of the clear delineation of areas of responsibility in the supplementary prescribing model.

#### **4.4. Aim and research questions**

The aim of this study was to gain more insight into the forces that have led to the introduction of nurse prescribing and into the legal, educational and organizational conditions under which nurse prescribing of medicines is realised in Western European and Anglo-Saxon countries. Moreover, we aimed to investigate which consequences nurse prescribing has for the division of jurisdictional control between the nursing and medical professions. The following research questions were addressed:

1. As a result of which external and internal forces has nurse prescribing been initiated or already realised in Western European and Anglo-Saxon countries?
2. Under which legal, educational and organizational conditions are nurses allowed to prescribe medicines within Western European and Anglo-Saxon countries ?
3. Which jurisdictional settlements can be discerned between the medical and nursing professions concerning the task of prescribing medicines?

## **4.5. Methods**

### **4.5.1. Sample**

To answer our research questions, an email questionnaire was sent to representatives of national and regional professional nursing and medical associations and government representatives in ten Western European and Anglo-Saxon countries: Australia, Canada, Finland, Ireland, the Netherlands, New Zealand, Spain, Sweden, the United Kingdom and the United States of America. These countries were selected because they had realised or initiated nurse prescribing, as had been revealed in our earlier systematic review of the literature and from contact with relevant stakeholders [5]. We considered nurse prescribing as 'being initiated' if at least a change in the law, or new legislation enabling nurses to prescribe medicines was in preparation, either at national, provincial or state level. As prescriptive authority in Australia, Canada and the USA is regulated at state, territorial or provincial level, we decided to select a purposive sample of three states, three provinces and five states respectively in these countries, and to invite representatives at state and provincial level to participate in our research as well.

To ensure that the most relevant professional associations were contacted, we used the membership lists of the International Council of Nurses (ICN) and World Medical Association (WMA) as points of departure. Professional associations and government bodies in the ten countries targeted were subsequently contacted by e-mail to obtain contact details of relevant representatives. In every country, state and province targeted, we strove to include at least one representative per type of association/government body in our study. Because of the variety in size and existing functions within professional associations and government departments, the decision as to who would be best suited to complete the survey was left up to the associations themselves. The majority of our respondents proved to be (vice) president, policy adviser or (chief) nursing officer within the organization in which they were employed.

### **4.5.2. Questionnaire**

The development of questions for the questionnaire was guided by the previous systematic literature review on nurse prescribing [5] and Abbott's theoretical model, which stresses the importance of internal and external forces in shaping professional competition over jurisdiction. Questions addressed the reasons for the introduction of nurse prescribing and the legal,

educational and organizational conditions under which nurses are or will be prescribing medicines. It should be noted that we did not ask for respondents' visions or opinions on nurse prescribing, but only for the actual organization of nurse prescribing across countries.

Since some countries have introduced multiple forms of nurse prescribing, which are based on different legal, educational and organizational conditions, we structured our questionnaire according to the three general models of (nurse) prescribing usually distinguished in the literature. This means that respondents had to fill in one or more sections of the questionnaire, depending on how many nurse prescribing models were present in their country. To enhance content validity, the initial draft of the survey was reviewed by two experts on health law and policy (see Acknowledgments). Adjustments were subsequently made on the basis of their feedback.

The final questionnaire, which is available from the first author, consisted of a total of 105 questions, including skip patterns, divided in five sections. The first section asked for general background information regarding nurse prescribing, such as in what year nurse prescribing was introduced. The following three sections addressed the three general models of prescribing usually distinguished in the literature, viz. independent prescribing, supplementary prescribing and district nurse/health visitor prescribing. Each of these three sections asked for the legal, educational and organizational conditions under which nurses are or will be prescribing medicines. Which and how many of the three sections respondents had to complete, was dependent on the number of nurse prescribing models present in their country. The questionnaire ended with a section concerning the financial aspects of nurse prescribing. Questions included multiple-choice questions and free-response forms. To prevent confusion, possibly unknown terms such as 'supplementary prescribing' and 'controlled drugs' were briefly explained in the questionnaire.

#### **4.5.3. Data collection and analysis**

After we received the contact details of the 60 persons most suited to complete the questionnaire from the organizations contacted, a total of 60 surveys, accompanied by a cover letter, were sent by email. Up to two reminders were sent at three-weekly intervals to those who did not reply initially. Respondents were offered the option to complete the survey digitally and return their answers by email or return a hard copy of the questionnaire by fax. However, all responses were received by email (n=39). Subsequently,

the majority of data were analysed by comparing respondents' answers between countries, i.e. by comparing the legal, educational and organizational conditions under which nurses are prescribing between countries. Additionally, data concerning the reasons for the introduction of nurse prescribing were analysed descriptively with calculations of response frequencies and percentages.

## 4.6. Results

### 4.6.1. Demographics

Of the 60 questionnaires that were mailed out, 39 were returned, yielding a response rate of 65 percent. This is a relatively high response rate for a survey [21], and may reflect respondents' engagement in the subject. For every country, state and province, at least one survey was returned by a representative of one of the associations contacted. The response rates per country and type of organization are presented in Table 4.1.

Table 4.1 Response rates per country/*state/province* and type of organization

	Nursing organization	Medical organization	Government body	Total # of completed surveys returned per country/ <i>state/province</i>
<i>Alaska</i>	1	-	1	2
<i>Alberta</i>	1	1	1	3
<i>Australia</i>	1	1	1	3
<i>Canada</i>	1	-	-	1
<i>Finland</i>	1	1	1	3
<i>Georgia</i>	1	-	-	1
<i>Ireland</i>	-	-	1	1
<i>Missouri</i>	1	1	1	3
<i>Netherlands</i>	1	1	1	3
<i>New Hampshire</i>	1	1	1	3
<i>New South Wales</i>	-	-	1	1
<i>New Zealand</i>	1	-	1	2
<i>North Carolina</i>	1	-	1	2

Table 4.1 -To be continued-

	<b>Nursing organization</b>	<b>Medical organization</b>	<b>Government body</b>	<b>Total # of completed surveys returned per country/ state/province</b>
<i>Ontario</i>	1	-	-	1
<i>Québec</i>	1	-	-	1
<i>South Australia</i>	1	-	1	2
<i>Spain</i>	-	-	1	1
<i>Sweden</i>	1	1	-	2
<i>Victoria</i>	1	-	1	2
<i>United Kingdom</i>	1	-	1	2
<b>Total # of completed surveys returned</b>	17	7	15	39
<b># of surveys sent</b>	20	20	20	60
<b>Response rate</b>	85%	35%	75%	65%

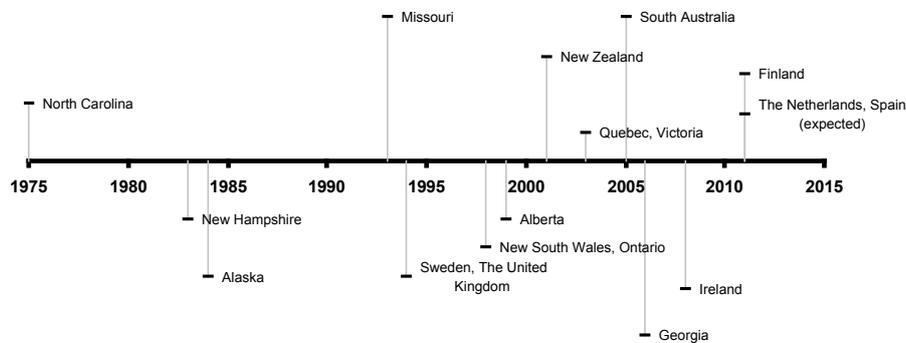
Even though our general response rate was relatively high, medical associations had a fairly low response rate (see Table 4.1). Representatives from two medical associations responded that they felt unqualified to accurately complete the questionnaire and one of them suggested alternative respondents. Health Canada (Federal Health Department) informed us that nurse prescribing falls under provincial and territorial jurisdiction and that we might wish to forward our survey to the provincial and territorial Ministries of Health. This advice was followed.

#### **4.6.2 Year of introduction of nurse prescribing**

Figure 4.1 shows the timeline for the introduction of nurse prescribing across the Western European and Anglo-Saxon countries, provinces and states studied. It is noteworthy that nurse prescribing constitutes a relatively recent development in some countries, whereas in other countries, especially in some US states, nurse prescribing has been around for decades. Respondents

sometimes showed minor deviations in the actual date of introduction. However, this might be explained by a frequently observed discrepancy between the point in time when a law is enacted or amended, and when it takes effect.

Figure 4.1 Timeline for the introduction of nurse prescribing



#### 4.6.3 Forces related to the introduction of nurse prescribing

Abbott's theoretical model stresses the importance of internal and external forces in shaping professional competition over jurisdiction. Therefore, we asked respondents the following question: "As a result of which forces was legal nurse prescribing introduced within your country?" Respondents could choose more than one answer from the list provided in Table 4.2 and/or give a free-text response under the "other" heading. Respondents most often mentioned improving the quality of care and solving the workforce shortages within the health care service as forces which led to the introduction of nurse prescribing. For example, 12 of the 17 nursing associations that completed our questionnaire mentioned these forces as having led to the introduction of nurse prescribing within their respective country, state or province. "To improve patients' compliance with drug regimens" was mentioned least often. Analysing representatives' answers at organizational level, we found differences between the three types of organizations. Representatives from nurses' associations (110/17) and government bodies (85/12) on average mentioned a higher number of forces compared to respondents from medical associations (16/7), see Table 4.2. They also think differently about the significance that certain forces have had in the introduction of nurse prescribing. While 9 out of 10 respondents from nurses' associations state that

nurse prescribing was introduced to meet the medication needs of patients living in remote geographical areas, only 1 out of 3 representatives of government bodies and medical associations labelled this as a force that led to the introduction of nurse prescribing. The forces most often cited by representatives of medical associations were the workforce shortages within the health care service (6 out of 10). Government bodies mostly considered the introduction of nurse prescribing as an effort to improve the quality of care (8 out of 10). The forces cited by respondents under the answer category “other” mainly referred to forces already covered by the predetermined answer categories. In particular the recognition of nurses’ skills and capacities, and offering patients quicker and better access to health care were again pointed out. However, answers given under the ‘other’ category were not classed under the existing multiple choice answer categories, as this would often imply double-counting.

Table 4.2 Answers given to the question: ‘As a result of which forces was legal nurse prescribing introduced within your country?’  
(multiple answers possible)

	<b>Nurses organization (n=17)</b>	<b>Medical organization (n=7)</b>	<b>Government body (n=15)</b>
To meet the medication needs of patients living in remote geographical areas	15	2	5
To improve the quality of care	12	2	12
As a solution to workforce shortages within the health care service	12	4	10
To offer patients quicker/more efficient access to medicines	12	2	10
To make better use of nurses’ skills	11	1	11
To increase the cost-effectiveness of the health care system	8	0	8
To improve patient choice	8	0	7
To modernise the health care system	8	1	6

Table 4.2 -To be continued-

	<b>Nurses organization (n=17)</b>	<b>Medical organization (n=7)</b>	<b>Government body (n=15)</b>
To increase team working within the health care service	8	0	5
To legalise standing prescribing practices by nurses (i.e. where a doctor rubber-stamps a prescribing decision taken by a nurse)	5	2	4
To reduce the workload of doctors and physicians	4	1	3
To improve patients' compliance with drug regimens	1	0	3
Other, please specify...	6	1	1
	<b>110</b>	<b>16</b>	<b>85</b>
<b>Total # of forces mentioned per type of organization</b>			
	<b>6.5</b>	<b>2.3</b>	<b>5.7</b>
<b>Mean # of forces mentioned per type of organization</b>			

#### **4.6.4 Conditions under which nurses are prescribing medicines**

##### *4.6.4.1 Legal conditions*

Before being allowed to start prescribing medicines, nurses in all Western European and Anglo-Saxon countries, provinces and states studied need to be formally registered. Most often, this involves registration with national nursing councils or health boards/councils, i.e. organizations that regulate, among others, the practice of nursing. However, where nurse prescribing is regulated at regional level, nurses generally register with state or provincial boards or colleges of nursing, such as in Canada and the USA. The exception is Australia, where nurses are always registered with the national regulatory body, even though nurse prescribing is regulated at state and territorial level.

All Western-European and Anglo-Saxon countries that have realised or initiated nurse prescribing have imposed legal restrictions on the categories of nurses that may prescribe medicines, what, how much and to whom they may prescribe, and whether they are allowed to do so on an independent basis or under the supervision of a physician. Nurses in almost all participating

countries are allowed to prescribe on an independent basis. The exceptions are formed by the US states Georgia, Missouri and North Carolina, where nurses are only allowed to prescribe under the supervision of a physician. This form of prescribing, known as supplementary prescribing or prescribing in partnership with a physician, is found in a number of the other countries, provinces and states as well, albeit in addition to independent prescribing. As stated before, a third form of nurse prescribing is found in the UK, viz. community practitioner nurse prescribing (formerly known as district nurse/health visitor prescribing). This form of nurse prescribing for community practitioners differs from independent prescribing mainly in terms of the scope of prescriptive authority.

Prescribing rights in most countries are limited to certain categories of nurses. In the majority of countries, only nurse practitioners (NPs) have independent and/or supplementary prescribing rights, but in Ireland, Spain, the UK and South Australia all registered nurses can become nurse prescribers. In a number of other countries, only nurses with a particular specialization can obtain prescribing rights, such as in the Netherlands, where NPs will be granted independent prescribing rights, and supplementary prescribing rights will be granted to three groups of specialized nurses, namely diabetes, COPD and oncology nurses.

Other regularly found limitations to nurses' prescriptive authority are mostly age or distance related. In Finland for example, all children will be excluded from nurses prescriptive authority, whereas in a number of other countries NP speciality areas are narrowing the patient age groups for which NPs can prescribe. In Georgia and Missouri, where nurses have only supplementary prescriptive authority, mileage restrictions apply which designate that the nurse must be practising within a specified number of miles of her or his collaborating MD. In most countries though, independent and supplementary prescriptive authority are not limited to specific patient age groups or specific geographical areas.

Even though we found that nurses in most countries are (or will be) allowed to prescribe medicines on an independent basis, their scope of practice varies considerably, depending on whether or not protocols and/or formularies are in place and if so, how restrictive these are. Protocols or group protocols refer to written instructions for the supply and administration of named medicines in an identified clinical situation, whereas a formulary is a list containing a

limited and defined number of medicines that can be prescribed. Clinical Management Plans (CMPs) are used in supplementary prescribing and relate to a named patient and to that patient's specific condition(s), while Collaborative Practice Agreements (CPAs) are mutually agreed upon plans between a nurse and one or more physicians that designate the scope of collaboration necessary to manage patient care.

Table 4.3 Use of formularies, group protocols, clinical management plans (CMPs) and Collaborative Practice Agreements (CPAs) in nurse prescribing

	Formularies			Group protocols	CPAs	CMPs
	Open	Specific	Individual			
<i>Alaska</i>	IP			IP		
<i>Alberta</i>	IP					
<i>Finland</i>		IP,SP				IP,SP
<i>Georgia</i>					SP	
<i>Ireland</i>					IP	
<i>Missouri</i>				SP	SP	
<i>Netherlands</i>		IP, SP		IP, SP		
<i>New Hampshire</i>	IP					
<i>New South Wales</i>		IP		SP		
<i>New Zealand</i>		IP		IP		
<i>North Carolina</i>					SP	
<i>Ontario</i>	IP					
<i>Québec</i>		IP				
<i>South Australia</i>			IP			
<i>Spain</i>		SP				
<i>Sweden</i>		IP				
<i>Victoria</i>		IP				
<i>United Kingdom</i>	IP, SP	CP				SP

IP = independent prescribing

SP= supplementary prescribing

CP= Community practitioner nurse prescribing

It is clear from Table 4.3 that formularies are most often used in nurse prescribing, especially open formularies – general formularies applicable at national or regional level – and specific formularies related to nurses' specialization and scope of practice. Other means to restrict nurses'

prescriptive authority such as (group) protocols, CMPs and restrictions contained in CPAs, are less often used in supplementary and especially independent nurse prescribing.

In practically all countries that have granted nurses independent prescribing rights, nurses are allowed to prescribe prescription-only medicines (POMs), albeit often limited to those POMs that fall within their scope of practice. The exception is formed by Spain, where independent nurses prescribers are only allowed to prescribe pharmacist-only (P) and general sales list (GSL) medicines. Internationally, most supplementary prescribers are also allowed to prescribe POMs, but again only those medicines that fall within their scope of practice. Community practitioner nurse prescribers in the UK are allowed to prescribe a very limited number of POMs, some Ps and lots of GSLs.

In the majority of countries, independent and/or supplementary nurse prescribers can prescribe all kinds of prescriptions (both initial as well as an infinite number of repeat prescriptions), just like community practitioner nurse prescribers in the UK. However, this authority is sometimes limited to a certain time period. In Ireland for example, independent prescribers are allowed to prescribe repeat prescriptions up to one month following the patient assessment, and in Georgia and Missouri supplementary nurse prescribers can prescribe a 90 day supply and a 120 day supply respectively (for schedule III narcotics).

Independent nurse prescribers and supplementary nurse prescribers bear the same responsibilities for the treatment process of patients, in which the prescription of medicines forms just one element. However, supplementary nurse prescribers share their responsibilities more often with doctors and physicians. There are a few countries where the kind of responsibility – full or shared – is the same for independent and supplementary nurse prescribers. In Spain for example, independent and supplementary nurse prescribers are fully responsible for clinical decisions regarding the care of patients, but when it comes to the clinical assessment and diagnosis of patients and the prescribing of medicines, both groups of prescribers share their responsibility with physicians.

#### *4.6.4.2 Educational conditions*

Regarding the place that nurse prescribing training occupies within the various national education systems and the level at which it is provided, there are some differences between countries. In the vast majority of Western

European and Anglo-Saxon countries, provinces and states studied, independent and supplementary prescribing courses form part of (Advanced) Nurse Practitioner education at Master degree level. However, in some countries prescribing training is provided through other educational programs. For example in Sweden prescribing training is part of the Primary Health Care Specialist Nursing programme, in the Netherlands supplementary prescribing training will initially be offered as a further education course at Bachelor level, whereas in Spain both independent and supplementary prescribing are taught as compulsory parts of the regular nursing degree (4 years) and as part of postgraduate Nursing Specialization programmes.

Furthermore, in some countries prescribing courses are offered on a stand-alone basis, i.e. they are offered apart from regular nursing curricula. In Ireland and the UK for example, where independent and supplementary prescribing training are combined into a dual qualification, education programmes for nurse prescribing are offered at Bachelor level and on a stand-alone basis. The same is true for Finland, where prescribing training is offered as a stand-alone professional development training at Bachelor level. In the Australian states New South Wales and Victoria, the prescribing subjects from the Master's Degrees of (Advanced) Nursing Practice can also be followed as separate courses, e.g. by nurses who have already completed a Master's degree. And in the UK, training for community practitioner nurse prescribing can be completed as integral part of the Specialist Community Public Health Nursing programme, but also as a stand-alone course.

Where prescribing courses are offered on a stand-alone basis, specific requirements have generally been established for nurses wishing to enter these courses. In Finland, Ireland and the UK, nurses, among others, need to have a minimum of three years clinical work experience (within the past five years) and support from their employer to be admitted to the separate prescribing course. In New South Wales and Victoria however, all interested nurses can take the prescribing subjects from the Masters Degrees as a separate course.

The content of training programmes for independent and supplementary nurse prescribing seems to be rather similar across Western European and Anglo-Saxon countries. Clinical pharmacology, clinical decision-making skills and diagnosis, consultation management, issues concerning concordance and adherence to medical treatment, legal, policy and ethical considerations

concerning nurse prescribing, professional accountability and responsibility, and prescribing within a team-context are part of nurse prescribing training in most countries that have granted nurses independent and/or supplementary prescribing rights, irrespective of level of training and whether training is offered through regular nursing curricula or on a stand-alone basis. The possible influence of the pharmaceutical industry on prescribing is less often addressed in the prescribing courses. Only in Australia, Canada, Ireland, Spain, the UK and some states of the USA are nurses being educated on this subject. A small number of respondents mentioned additional course subjects, such as health research in Australia and complementary therapies in Ontario. In almost all Western European and Anglo-Saxon countries studied, nurse independent and supplementary prescribing courses contain a practical component or internship. Only in Georgia, New South Wales, North Carolina and Sweden do nurses finish their training without completing a period of learning in practice. Supervision during the internship is most often provided by nursing educators and instructors and nurse supervisors, and somewhat less by medical supervisors. Although in Ireland and the UK medical supervision is a requirement.

#### *4.6.4.3 Organizational conditions*

Our earlier review of the nurse prescribing literature showed that organizational conditions and especially financial issues are scarcely addressed in the literature. Therefore, we incorporated a number of questions on financial issues in our questionnaire, among others concerning the financing of nurses' prescribing training. We found some differences in this regard. In New South Wales and Victoria, where prescribing subjects from Master's degrees can also be followed as separate courses, nurses have to pay the educational costs themselves. In Ireland, however, funding for separate nurse prescribing training is made available through the national government, whereas in Finland the national government and nurses' employers share the costs. In the UK, nurses and their employers share the training costs.

We also asked respondents whether prescriptions written by nurses are covered and if so, under which conditions and whether possible restrictions apply. Two respondents indicated they did not know the answer to this question and two respondents left the question blank. Moreover, we received contradictory answers for Alaska, Alberta, Australia, Finland, New Hampshire, North Carolina and Victoria. However, we note that in Georgia, the Netherlands, New Zealand and Sweden prescriptions written by nurses are

covered by all insurance providers at the same rate as medicines prescribed by physicians. In other countries, provinces and states, the degree of reimbursement or coverage is influenced by characteristics of the nurse or policies of the insurer. For example in South Australia, only NPs working in rural and remote areas have access to the Pharmaceutical Benefits Scheme (PBS), whereas prescriptions written by NPs in metropolitan areas are not reimbursed by the PBS, except in acute settings.

An important issue for the nursing profession is whether the newly achieved prescribing task has resulted in higher payments for nurse prescribers. However, there is much ambiguity as to this issue. Seven respondents indicated they did not know whether nurses holding a prescribing qualification receive a higher financial compensation than comparable nurses without a prescribing qualification, and in another six states and countries, Alaska, Missouri, New Hampshire, New Zealand, North Carolina and South Australia, we found inconsistent answers to this question. What became clear, however, is that in most countries prescribing nurses do earn more than nurses without a prescribing qualification, but this is to be attributed to their general Advanced Nurse Practitioner qualification and not to their prescribing qualification as such.

#### ***4.6.5 Jurisdictional settlements between the nursing and medical profession***

In order to answer research question 3 and determine which jurisdictional settlements can be discerned between the medical and nursing professions concerning the task of prescribing medicines, we will now discuss the conditions under which nurses are prescribing across Western European and Anglo-Saxon countries in the light of Abbott's theory on the division of labor [19]. Our results showed that almost all countries, states and provinces studied introduced independent nurse prescribing. Based on the formal definition of independent prescribing found in the literature, this would suggest that nurses and doctors in most Western European and Anglo-Saxon countries are sharing full and equal jurisdiction over the prescribing task. However, in many countries we found that such severe restrictions applied to nurses' independent prescriptive authority, via formularies of medicines and/or protocols, that it becomes impossible to speak of shared full jurisdictional control between the medical and nursing professions. These independent nurse prescribers mostly prescribe in a subordinate position to the medical profession. Moreover, in some countries, nurses' prescriptive

authority is limited by legislation or regulations to certain patient (age) groups. Not only does this constitute an even more restrictive form of subordinate jurisdiction, but it also involves elements of client differentiation. Only in the UK, where nurses prescribe independently from the entire British National Formulary for all medical conditions in their area of competence, does the level of nurses' autonomy prove sufficient for both the nursing and medical professions to be considered as holding equal and full jurisdiction over prescribing.

Supplementary prescribing is the single form of prescriptive authority for nurses in Georgia, Missouri and North Carolina, and a common form of prescribing in a number of other Western European and Anglo-Saxon countries. However, the conditions under which nurses prescribe in these countries do not always fully correspond with the formal definition of supplementary prescribing as provided in the introduction of this article. Nevertheless, these requirements do create a model of prescriptive authority highly comparable to supplementary prescribing, as doctors and nurses are (in)directly sharing the prescribing task. This means that where doctors and nurses are sharing the prescribing task, and both have particular responsibilities in the medical care of a patient, supplementary prescribing can be considered as a form of prescribing within a 'full division of labor', in Abbott's terms.

Hence, it is clear that the jurisdiction over the prescribing task in most countries, apart from the UK, remains predominantly with the medical profession.

#### **4.7. Discussion**

In almost all countries involved in this study, (specific categories of) nurses are or will be allowed to prescribe on an independent basis, with the exception of three American states where nurses are only allowed to prescribe under the supervision of a physician. This form of prescribing is known as supplementary prescribing and can be found in a number of other countries as well, albeit in addition to independent prescribing. In the UK, a third main form of prescribing was distinguished, viz. community practitioner nurse prescribing. In the majority of Western European and Anglo-Saxon countries, only nurse practitioners can obtain prescriptive authority. In a number of countries nurses with a particular specialization can also acquire prescribing

rights and in a few countries all registered nurses can become nurse prescribers. Most nurses prescribe from formularies, which are often to a greater or lesser extent restricted and/or tailored to specific conditions.

Preparation for prescribing occurs in the majority of Western European and Anglo-Saxon countries at Master level and through regular nursing curricula, most often a Master's Degree in Advanced Practice Nursing. However, in a few countries (e.g. Ireland and the UK) nurses are qualified via stand-alone courses and/or at Bachelor level. The content of training programmes appears to be fairly similar across all Western European and Anglo-Saxon countries, and often includes a period of learning in practice. However, in several countries, questions have been raised whether nurses are sufficiently prepared by current educational programmes and how knowledge will be maintained and further developed after their initial training [23-25]. In the light of the ongoing development of nurse prescribing internationally, further research should address these questions.

When it comes to the financial organization of nurse prescribing, we found differences between countries. In some countries (e.g. in some Australian states), separate prescribing courses for nurses are paid for by the nurses themselves, whereas in other countries costs are shared between the nurse, employer and/or government bodies. The degree of reimbursement for nurses' prescriptions also differed between countries, depending on characteristics of the nurse or policies of the insurer. What is most important perhaps, is that we received a relatively large number of contradictory answers to these financial questions and quite a number of respondents indicated not to know the answers. This is startling, as financial issues, especially related to reimbursement issues and education costs, are repeatedly mentioned as one of the main barriers to nurse prescribing [26-28]. Many Western European and Anglo-Saxon countries, including those countries that are considering the introduction of nurse prescribing (such as Spain and The Netherlands), should pay attention to this – not only to make nurse prescribing practically feasible, but also to maintain the enthusiasm of nurses for taking up the prescribing task.

Applying Abbott's theory on the legal, educational and organizational conditions under which nurses are prescribing across countries, we conclude that the jurisdiction over the prescribing task in most countries, apart from the UK, remained predominantly with the medical profession. To elaborate on this conclusion, one must look at the forces that led to the introduction of nurse prescribing, as mentioned by representatives of different types of

associations. As Abbott states, views on internal and external forces shape professional conflict over jurisdiction. Hence, where representatives of different organizations mention different forces as having been important in the introduction of nurse prescribing, this can be interpreted as a professional strategy to influence the division of jurisdiction over the prescribing task. In this study we indeed found that representatives of nursing associations, medical associations and government bodies cited different forces as being important in the introduction process of nurse prescribing. Respondents from medical associations almost only mentioned forces that made the nurse prescribing initiative a necessity, such as workforce shortages within the healthcare service, while respondents from nursing associations also frequently brought up reasons with less immediate urgency, such as the possibility to make better use of nurses' skills. By solely stressing the forces which make nurse prescribing an inevitable necessity, the medical profession may have strategically tried to retain as much jurisdictional control as possible, while the nursing profession may have aimed for the opposite result. Professions may in this way have tried to construct the task of prescribing medicines in their favour. This would be consistent with the finding that professional medical associations in most countries – in Australia, Spain, Sweden and the USA for example – have mainly opposed nurse prescribing [6,7,28-30]. Besides, this might be an explanation for the relatively lower response rate of medical associations in this survey (35%) compared with government bodies (75%) and nurses associations (85%).

#### **4.8. Limitations**

The study has several limitations. First, the response rate for representatives of medical associations is lower (35%) than that for government bodies (75%) and nursing associations (85%). Second, a small number of questions concerning the financial organization of nurse prescribing generated conflicting answers from respondents in the same country, state or province. This limits the degree of certainty with which we can make statements about financial aspects of nurse prescribing internationally. It should be noted that differing answers were found both in countries where nurse prescribing constitutes a relatively new phenomenon as well as in countries that had years of experience with nurse prescribing already. Hence, this discrepancy may indicate a serious problem, in that even stakeholders in the field of nurse

prescribing are uncertain and/or have gaps in their knowledge about the financial organization of nurse prescribing, which is oftentimes difficult to understand. Thirdly, because our focus was on nurse prescribing, alternatives such as emergency provisions, were not discussed. Nevertheless, their possible presence across countries might have influenced the forces which led to the introduction of nurse prescribing and the conditions under which nurse prescribing was realised.

#### **4.9. Conclusion**

A diversity of external and internal forces led to the introduction of nurse prescribing internationally. Respondents from nurses associations, medical associations and government bodies cited different forces as being important for the introduction of nurse prescribing. This can be conceived as professional problem construction in order to gain jurisdiction over the prescribing task. The legal, educational and organizational conditions under which nurses prescribe medicines vary considerably between countries, from situations where nurses prescribe independently to situations in which prescribing by nurses is only allowed under strict conditions and the supervision of physicians. As a result, a variety of jurisdictional settlements between the nursing and medical professions concerning the task of prescribing can be discerned. In the UK, nurse prescribers share (full) jurisdiction with the medical profession, but in most countries, nurses prescribe in a subordinate position and the jurisdiction over prescribing remains predominantly with the medical profession.

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# 5

## **Nurse prescribing: views and expectations of Dutch stakeholders**

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## **Abstract**

### **Objective**

Legislation will come into effect in the Netherlands during 2012 giving nurses the authority to prescribe medication. The objective of this study was to gain insight into the views of Dutch stakeholders on the introduction of prescribing authority for nurses, the conditions under which nurses will be prescribing and the expectations the groups involved have regarding prescribing authority.

### **Methods**

Thirteen semi-structured interviews were held with representatives of nursing organisations, physicians' organisations and other relevant national bodies in the area of nurse prescribing.

### **Results**

The interviewees agree that the current situation in which unlawful prescribing is tolerated by the authorities is the main reason for introducing prescribing authority. Physicians' organisations generally take a less positive view of this prescribing authority than nurses' organisations, and the two groups differ in their opinions about the conditions under which nurses will be allowed to prescribe medication. For instance, physicians' organisations would have preferred to see compulsory partnerships between doctors and nurses, whereas nurses' organisations see such partnerships as self-evident and therefore consider it unnecessary to make them compulsory.

### **Discussion and conclusion**

Although all the groups involved point to the current situation of toleration as an important motivating factor, they may have different rationales for this. For the reallocation of tasks to take place as smoothly as possible, it is important that organisations inform their members in good time about the impending changes so that they can take timely measures to be prepared for the changes in practice.

## 5.1. Introduction

In the Netherlands, legislation will come into effect during 2012 giving certain categories of nurses and nurse specialists the authority to prescribe medication. The Medicines Act and the Individual Healthcare Professions Act (the BIG Act) were amended in 2007, based in part on the advisory report ‘Taakherschikking in de gezondheidszorg’ (‘Task reassignment in the health sector’), produced in 2002 by the Council for Public Health and Care (RVZ) [1], and the report by the LeGrand commission in 2003 [2]. These amendments included incorporating the prescribing of prescription medicines as a restricted task in the BIG Act.

When the legislation comes into effect, designated categories of nurses will be allowed to prescribe a limited number of medicines [3]. These are nurses who have completed one or more advanced nurse training programmes focusing on the care for specific categories of patients, after obtaining their basic nursing qualification. Initially, three categories of nurse will be given prescribing authority: diabetes nurses, lung nurses and oncology nurses. Nurse specialists will also get the authority to prescribe medicines. Nurse specialists are nurses who have obtained a Master's degree in Advanced Nursing Practice and who work in one of the five recognised nursing specialist fields in the Netherlands: preventive care, acute care, intensive care, chronic care or mental health care [4]. They are expected to get broad authorisation to prescribe medicines, linked to the field of expertise in which they work.

Separate legislative routes apply to the two groups. Table 5.1 summarises the legislative changes relating to nurse prescribing authority that have already taken place and specifies what still needs to be arranged.

Table 5.1 Summary of legislative changes relating to the prescribing authority of nurses

<b>How will the registration of prescribing authority in the BIG register operate?</b>
<ul style="list-style-type: none"><li>• Categories of nurses designated by the Minister of Health, Welfare and Sport can register their authority to prescribe on a voluntary basis in the Individual Healthcare Professions (BIG) register [3].</li><li>• The prescribing authority of nurse specialists is linked to their registration as specialists and therefore does not have to be registered separately [7].</li></ul>

Table 5.1 – To be continued -

**What has been arranged so far (up to December 2011)?**

- The prescribing authority of the designated categories of nurses is provided for in Article 36, paragraph 14, subparagraph d of the BIG Act. This prescribing authority is subject to a number of conditions:
  1. The diagnosis must have been made by a physician, dentist or midwife.
  2. Nurses must adhere to medical protocols and standards for prescribing.
  3. Nurses must prescribe "within the limits to be set for the scheme", as regards the scope of their authority [5].
- The prescribing authority of nurse specialists is an element in Article 36a of the BIG Act (the 'experimental article'), which grants designated healthcare professionals the independent authority to carry out certain restricted tasks for a trial period of five years; these tasks include the prescribing of prescription medicines [6;7].
- The Lower and Upper Houses of the Dutch Parliament have agreed to both the above proposed legislative amendments. As a result, the proposed amendments are now law.

**What still needs to be arranged?**

- The legislative amendments still need the signature of the Dutch Queen and one or more ministers in order to be formally ratified.
- The ministerial order designating the categories of nurses who will be given the authority to prescribe prescription medicines (in all probability this will initially be diabetes nurses, lung nurses and oncology nurses) still has to undergo the preliminary scrutiny procedure in the Upper and Lower Houses.
- As regards the prescribing authority of nurse specialists, the legislation needs to be elaborated in the form of an order in council; this involves asking the Council of State to give its advice. Initially, Article 36a will apply to physician assistants (who are not considered in this paper) and nurse specialists.

When nurses start prescribing medicines on a legal basis in the near future, they will be entering an area that has traditionally been the prerogative of physicians, dentists and midwives. Physicians will therefore be facing a 'rival' profession in this domain [8-10]. This changes the subdivision of control over the prescribing of medication.

According to the sociologist Abbott [8], shifts in tasks and debates between professions about the control over a certain task, in this case prescribing medication, are influenced by various 'internal' and 'external' factors. Internal factors are associated with developments within professional groups, such as the pursuit of more autonomy, whereas external factors relate to the wider developments in society, such as the efforts to improve healthcare efficiency. A recent international literature review reveals great diversity in the internal and external factors that played a role in the introduction of prescribing

authority for nurses in countries where nurses have been allowed to prescribe medicines for some time [11]. Furthermore, nurses' organisations, physicians' organisations and government bodies mention different factors as being the main reason. For instance, foreign physicians' organisations put more emphasis on the shortage of physicians whereas other groups are more likely to emphasise the desire to make optimum use of nurses' skills [12]. In the context of debates between professions about the boundaries of professional domains, emphasising certain internal and external factors can be seen as a professional strategy [8]. After all, professions are able to claim more control and may be able (in this case) to influence the scope of nurses' prescribing authority by construing tasks such as prescribing medication in such a way that they fall within their own field of expertise. For example, focusing on a shortage of physicians can reduce prescribing authority for nurses to simply a necessity and be a case for minimal prescribing rights whereas emphasising the importance of making optimum use of nursing expertise can be an argument for wider prescribing rights.

Thinking in terms of domains is still prevalent among professional groups in the Netherlands [1;9;10]. In 2002, the Council for Public Health and Care identified various policy issues that could hinder the reallocation of tasks; it considered the tendency to think in terms of domains as "the most intransigent problem" [1]. Discussions about the demarcation of domains take place not just in the workplace but also at the level of national professional organisations. For example, medical organisations in countries including America, Australia and Sweden have fiercely opposed the introduction of prescribing authority for nurses [13-15] while research by Walby *et al.* [16] shows that most tensions between physicians and nurses in the workplace in Great Britain concern professional boundaries. Given the intransigence of the tendency to think in terms of domains and the possible consequences this could have for healthcare practice, it is important to investigate what opinions physicians' organisations, nurses' organisations and other relevant groups have on this subject before the implementation of prescribing authority for nurses. To this end, the following research questions were formulated:

- What internal and external factors led to the introduction of prescribing authority for nurses in Netherlands, according to national stakeholders?
- What are the views of national stakeholders regarding the conditions under which nurses will be able to prescribe medication?
- What expectations do national stakeholders have for the future regarding prescribing authority for nurses?

## 5.2. Method

At the start of 2011, semi-structured face-to-face interviews were conducted with key national stakeholders involved in prescribing authority for nurses in the Netherlands (see Table 5.2 for an overview of the interviewed groups). Face-to-face interviews were not possible in two cases because the respondents were unable to find time in their schedule; one of these interviews took place in writing and the other interview via the phone. A list of relevant organisations and potential respondents within those organisations was drawn up by the supervisory committee for this study. That committee included representatives of KNMG (the umbrella association for physicians) and V&VN (the umbrella association for nurses) as well as NIVEL (the Netherlands Institute for Health Services Research). The interviewees were mainly policy workers or board members, and they were asked to present the organisation's standpoint. The interviews were conducted by one or two interviewers using a topic list drawn up beforehand.

Table 5.2 Overview of the groups interviewed for the study of medications being prescribed by nurses

<p><b>Nurses' organisations</b> First association of diabetes nurses (EADV) Nurses &amp; health carers in the Netherlands (V&amp;VN) V&amp;VN nurse specialists/nurse practitioners (V&amp;VN VS/NP) V&amp;VN lung nurses and V&amp;VN oncology (V&amp;VN L/O)</p> <p><b>Physicians' organisations</b> Royal Netherlands Medical Society (KNMG) National Association of General Practitioners (LHV) - written interview Dutch College of General Practitioners (NHG) Netherlands Association of Internal Medicine (NIV)- interview by phone Verenso, Dutch Association of Elderly Care Physicians and Social Geriatricians</p> <p><b>Other stakeholders</b> Royal Dutch Society for the Advancement of Pharmacy (KNMP) Ministry of Health, Welfare and Sport Federation of Patients and Consumer Organisations in the Netherlands (NPCF)</p>
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The topic list was developed using the international literature study and survey [11;12] of prescribing by nurses we conducted earlier. An overview of the

topics discussed can be found in Table 5.3. A report was made summarising each interview and handed to the interviewee for approval. The final approved interview reports formed the basis of our analysis, which took the form of a thematic analysis [17]. The interview data was subjected to deductive analysis using the topics in the topic list. Then recurring themes were identified and text fragments sorted by theme.

Table 5.3 Topics in the topic list

<ul style="list-style-type: none"> <li>- General information about the respondent/organisation</li> <li>- Views on the prescribing authority for nurses</li> <li>- Extent of support for nurse prescribing</li> <li>- Introduction of prescribing authority for nurses</li> <li>- Statutory conditions</li> <li>- Educational conditions</li> <li>- Organisational conditions</li> <li>- Challenges and threats for the work of physicians and nurses resulting from the prescribing authority for nurses</li> </ul>
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### 5.3. Results

#### *Reasons for introducing prescribing authority and the resulting legislative route*

Internal factors play a key role in the introduction of prescribing authority for nurses in the Netherlands. Nurses' organisations are agreed that the main reason for the introduction of prescribing authority for nurses is the current practice of 'turning a blind eye' in which nurses are already involved in prescribing or are themselves prescribing medication without there being any legal basis for this. The umbrella organisation for physicians (KNMG) also points to the current situation of toleration as an important motivating factor for the prescribing authority for nurses.

In the case of nurse specialists, they are trained to take over certain tasks from physicians and the prescribing authority is in line with this, according to nurses' organisations. The Healthcare Inspectorate, the NPCF (the lobby organisation for patients) and the Ministry of Health also point to the further professionalisation of nurses as a group as an important reason for the introduction of prescribing authority for nurses. In addition, nurses' organisations lobbied hard in the Lower House of the Dutch Parliament for

prescribing authority, and it was partly because of this that the Lower House adopted an amendment to the Medicines Act to this end in 2006.

External factors seem to have played less of a part in the introduction of prescribing authority for nurses, although the KNMG does point to the required increase in the efficiency of healthcare practice in view of the capacity problems. The Healthcare Inspectorate and the Ministry of Health also point to staff shortages in healthcare and task reallocation as external factors that play a role in the introduction of prescribing authority for nurses.

### ***Support for prescribing authority for nurses***

Representatives from nurses' organisations emphasise that prescribing medication is so much a part of day-to-day practice for some nurses that they are pleased there will now be a legal basis for this (EADV, V&VN L/O, V&VN). In addition, prescribing authority is seen as an enhancement of nursing as a profession and for career prospects. Even so, these stakeholders mention a range of reactions among their members. Representatives of diabetes, lung and oncology nurses say there is considerable support among their members. However, the representative from the nurses' umbrella organisation argues that on average, highly qualified nurses take a more positive view of the impending introduction of prescribing authority than general nurses with fewer qualifications; the latter are more likely to be worried that this will turn nurses into semi-doctors.

The KNMG says that there is a widespread lack of knowledge about the subject among physicians at present, which may have a negative impact on the support for prescribing authority for nurses. The KNMG acknowledges that there are both physicians in favour and physicians opposed to the measure, but it also says the majority seem to be either neutral or moderately in favour of prescribing authority for nurses.

The association of pharmacists (KNMP) takes a positive view of the reallocation of tasks in principle, as long as the individuals prescribing medication are sufficiently proficient and have the right authority. The pharmacists feel it is important to know exactly what proficiencies, authorities and areas of expertise the new categories of prescribers will have.

### ***Views on prescribing authority for diabetes, lung and oncology nurses***

Nurses' organisations are happy with the initial selection of diabetes, lung and oncology nurses as the categories being given prescribing authority. The choice for these three groups is largely because they often already prescribe

medication in practice (to a limited extent) but up to now there has not been a legal basis for this.

On the other hand, physicians' organisations take a more cautious, or even downright negative, attitude to prescribing authority for certain categories of nurses. The internal medicine association prefers prescribing authority for nurses to be restricted to situations where there are agreements about the medical indications for which nurses are allowed to prescribe medication and the circumstances in which this is permitted. The KNMG states that it would have preferred prescribing by certain categories of nurses to be regulated through the experimental article, but it accepts the initial choice of diabetes, lung and oncology nurses. It does raise the question whether the authority to dispense medication via a protocol that has been prescribed by a physician would not have sufficed, given the limited nature of the prescribing authority. Verenso (the association of specialists in geriatric medicine) and the associations of GPs are opposed to prescribing authority for specific categories of nurses. For instance, the National Association of General Practitioners (LHV) says that nurses lack the necessary knowledge about interactions to be able to prescribe medication properly, and the chairman of the board of the Dutch College of General Practitioners (NHG) argues that a partnership between physicians and nurses gives a better safeguard of healthcare quality than when an authorised nurse is given full responsibility. The NHG says that given the responsibility physicians bear, they will not be able to relinquish their involvement and will therefore ensure good protocols and agreements with the prescribing nurses, which could lead to different results depending on the individual nurse.

Other groups involved in the introduction of prescribing authority for nurses take a neutral stance with regard to the selection of diabetes, lung and oncology nurses. The representative from the Ministry of Health says that the choice of these three categories is mainly because they took the initiative to approach the Ministry and they turned out to meet the required criteria. The Ministry of Health expects prescribing authority to be extended in the future to other categories of nurses as well.

A consistent criticism from a number of nurses' organisations, the umbrella organisation for physicians and the pharmacists' organisation concerns the fact that the prescribing authority for categories of nurses can be entered in the BIG register on a voluntary basis, based on completed training programmes. The professional organisations would have preferred this registration to be compulsory, given the public function the BIG register

serves. Nurses' organisations will therefore be encouraging their members to have their prescribing authority registered.

***Views on prescribing authority for nurse specialists with a Master's degree***

Although the umbrella organisation for nurses (V&VN) would have preferred nurse specialists to get permanent prescribing authority immediately, the interviewed nurse representatives are happy with the prescribing authority for nurse specialists as incorporated in the five-year experimental article (Article 36a) in the BIG Act (see Table 5.1). The same applies to Verenso, provided that the nurse specialists comply with the treatment protocols when prescribing medication and are obliged to refer back to the geriatric specialist in the case of certain blood values.

Other physicians' organisations, on the other hand, object to the far-reaching prescribing authority given to nurse specialists. Both the KNMG and the LHV consider the conditions currently attached to the prescribing authority for nurse specialists to be insufficient for guaranteeing the meticulousness and quality of healthcare during the trial period. Both organisations lobbied in vain in the Lower House for an obligation for restricted tasks performed by nurse specialists (including the prescribing of medication) to be carried out within partnerships that are subject to protocols and include at least one physician.

The main criticism from the pharmacists' organisation (KNMP) concerns what it sees as the vague categorisation of specialist nursing fields. Moreover, the KNMP has doubts about the idea that the nurse specialists should perform the routine tasks while the physicians take on the more complex cases. It wonders how this division will be implemented in practice.

All the groups involved are united in their view that the criteria that will be used to evaluate the experimental article (see Table 5.1) are still unclear, although these criteria do need to be defined in advance. While many of the groups explicitly mention patient and medication safety as evaluation aspects, there are clear differences in emphasis. For example, the Healthcare Inspectorate attaches great value to the requirements that nurses' basic education in pharmacotherapy, pharmacology and pharmacokinetics has to satisfy, while nurses' organisations (V&VN USA/NP) mention the high quality of the care delivered by nurse specialists as a key evaluation topic.

### ***Consequences of prescribing authority for physicians and nurses in practice***

According to the representative from the Ministry of Health, there are theoretically three possible scenarios for the future when the trial period ends and the evaluation of the temporary granting of prescribing authority to nurse specialists has been carried out: the temporary granting of authority could be discontinued completely, the temporary granting of authority could be made permanent in the BIG Act, or the temporary granting of authority could be modified in such a way that new professional groups get functional independence (i.e. professionals are considered competent to perform certain restricted tasks for another party without the supervision or intervention of that other party). Although the complete cessation of the temporary granting of authority is a theoretical possibility, the physicians' organisations, nurses' organisations and Ministry all emphasise that this is highly unlikely. It seems more likely that the final details of the conditions under which a reallocation of tasks can take place will be modified on the basis of the evaluation.

All the groups interviewed assume that the introduction of prescribing authority for nurses will change the relationship between physicians and nurses in the workplace. Nurses' organisations, representatives from the KNMG, the Healthcare Inspectorate and the Ministry foresee two possible responses among physicians: either they will embrace prescribing authority for nurses, for example because it will free up time for them to concentrate on more complex healthcare, or they will adopt a cautious stance and see prescribing authority in terms of domain demarcation. However, the groups assume that any initial reservations among physicians will disappear once clear agreements have been made and the safety of prescribing by nurses has been demonstrated in practice. The professional associations see the provision of information for their members and answering questions concerning prescribing authority for nurses as an important future task.

## **5.4. Discussion**

Representatives of both nurses' organisations and the physicians' umbrella organisation cite the current toleration of a situation in which nurses prescribe medication without any legal basis for doing so as the main reason for the legislative measures that will shortly lead to legal prescribing authority for nurses. Toleration of unlawful situations also occurs in the Netherlands in

other areas, for example soft drugs, immigration policies and (until recently), prostitution and euthanasia. In his analysis of the lead-up to the Dutch euthanasia legislation, the historian Kennedy (2002) calls the "openness to debate" of subjects or activities that are forbidden by law but still take place a typically Dutch phenomenon [18]. For example, prior to the current legislation that permits euthanasia under very strict conditions, there were open discussions about the fact that physicians sometimes consented to requests from patients for euthanasia (which was illegal). Kennedy argues that it was precisely this openness that led to the liberalisation of the euthanasia legislation, which was seen as an "unavoidable development". The argument went that critics and opponents as well as supporters would be better off focusing on the sound regulation of this unavoidable practice. We see a comparable argument in the case of prescribing by nurses.

But it is not self-evident that nurses' organisations and the physicians' umbrella organisation should be unanimous in pointing to the current situation of toleration as the main internal factor leading to prescribing authority for nurses. After all, different groups may emphasise different internal and external factors as a professional strategy for maintaining or acquiring control over tasks, such as the prescribing of medicines [8;12]. However it is possible that different motivations lie behind the identification of the current situation of toleration as the main reason by the two groups of stakeholders - the representatives of nurses and the representatives of physicians. The medical profession may find the current situation of toleration awkward because of the continual possibility of a warning or reprimand from the Healthcare Inspectorate, whereas the nursing profession may want more formal professional autonomy and recognition for the fact that some nurses are already prescribing medication in the current situation of tolerance.

The interviews revealed that wanting recognition for the tasks being performed and obtaining the associated autonomy were important reasons for the nursing profession's desire for legal prescribing authority. However, it is debatable whether nurses will have a greater feeling of autonomy once they obtain this authority. For example, oral hygienists who saw a major reallocation of tasks and consequently acquired a broader set of tasks in recent years now experience significantly less autonomy than oral hygienists with a traditional set of tasks [19]. Some possible explanations for this are that the new tasks require more supervision and checks and that they have to be performed more strictly in accordance with protocols and criteria. This

paradoxical situation, in which theoretically more flexible rules lead to stricter regulations and enforcement in practice, is also evident in other areas in which a tolerated situation is made legal [20].

The interviews showed clearly that representatives of physicians' organisations generally took a less positive, and sometimes downright negative, attitude towards the prescribing authority for diabetes, lung and oncology nurses and nurse specialists (with a Master's degree) when compared with stakeholders from nurses' organisations and other groups. Even so, all groups were agreed that it is very unlikely that the temporary granting of authority to nurse specialists will be completely revoked after the trial period ends. It is more likely that the conditions under which task reallocation may take place will be modified. Physicians are therefore also following this line of reasoning despite their relatively negative views on prescribing authority for nurse specialists. One possible explanation is that the medical profession sees the legalisation of prescribing authority for nurses as an "unavoidable development" [18] and feels it would be better off devoting its energy to regulating this practice in as satisfactory a manner as possible.

It should be noted that the stakeholders, with the exception of nurses' organisations, turned out to know little about the educational conditions that nurses with prescribing authority have to satisfy. It also transpired that the organisational conditions, including for example the requirement to have local guidelines or their own prescription paper, still needed to be set up in many cases. This why these two aspects were left out of the Results section. It is also important for the interpretation of our results to take into consideration the fact that the interviews were with policy makers or representatives of organisations. We might have found different results if we had also interviewed healthcare professionals working in the field. In England, for example, where nurses have had prescribing authority since 1998 [11], a recent large-scale survey commissioned by the Department of Health showed that other professionals - including physicians - take a more positive attitude to prescribing by nurses when they have actual experience of such prescribing than when they do not [21]. At the same time, we must not lose sight of the fact that many tensions between physicians and nurses in the workplace concern their professional boundaries [16]. Follow-up research should therefore focus on the views and expectations of physicians and nurses as well as other relevant professionals in the workplace concerning the prescribing authority for nurses. This would shed more light on the question as to whether, and to what extent, there is a discrepancy between the views of

stakeholders at the organisational level and professionals in daily practice. It would also provide information on the extent to which nurses and physicians are already aware of nurses' prescribing rights. After all, our interviews suggest that some of the relevant professionals on the ground are currently unclear about the prescribing authority of nurses. It is important that this lack of clarity is dealt with in good time. The plans that professional organisations have to inform their members about the changes can make a significant contribution here.

## **5.5. Conclusion**

The current toleration of a situation in which certain nurses are already prescribing medication is an important motivating factor behind the impending introduction of legal prescribing authority for nurses. Physicians' organisations generally take a less positive view of this prescribing authority than nurses' organisations and the two differ in their opinions on the conditions under which both nurses in specialised fields and nurse specialists will legally be allowed to prescribe medication. For instance, physicians' organisations would have preferred to see compulsory partnerships between doctors and nurses, whereas nurses' organisations see such partnerships as self-evident and therefore consider it unnecessary to make them compulsory.

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# 6

## **Knowledge claims, jurisdictional control and professional Status: the case of nurse prescribing**

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## Abstract

Over the past decades, professional boundaries in health care have come under pressure, and the expansion of prescriptive authority to include nurses touches on issues of professional domains and interprofessional competition. Knowledge claims play an important role in achieving jurisdictional control. Knowledge can take on multiple forms, ranging from indeterminate to technical (I/T ratio) and from everyday to exclusive knowledge. To investigate the interrelatedness of jurisdiction, knowledge claims and professional status, we examine which knowledge claims were made by the medical and nursing professions in the Netherlands to secure or obtain, respectively, jurisdictional control over prescribing, and which form this knowledge took. The study is based on thirteen semi-structured stakeholder interviews and an extensive document analysis.

We found that the nursing profession in its knowledge claims strongly emphasized the technicality and everyday knowledge character of the prescribing task, by asserting that nurses were already prescribing medicines, albeit on an illegal basis. Their second claim focused on the indeterminate knowledge skills of nurses and stated that nurse prescribing would do justice to nurses' skills and expertise. This is a strong claim in a quest for (higher) professional status. Results showed that the medical profession initially proclaimed that prescribing should be reserved for doctors as it is a task requiring medical knowledge, i.e. indeterminate knowledge. Gradually, however, the medical profession adjusted its claims and tried to reduce nurse prescribing to a task almost exclusively based on technicality knowledge, among others by stating that nurses could prescribe in routine cases, which would generate little professional status. By investigating the form that professional knowledge claims took, this study was able to show the interconnectedness of jurisdictional control, knowledge claims and professional status. Knowledge claims are not mere rhetoric, but actively influence the everyday realities of professional status, interprofessional competition and jurisdictional division between professions.

## 6.1. Introduction

Over the past decades, professional boundaries in health care have come under pressure, among others as a result of flexible neo-liberal approaches to managing health care [1,2]. The number of countries where nurses are legally permitted to prescribe medication has grown considerably [3-5]. Recently, the creation, establishment and renegotiation of boundaries has become a key theme in the sociology of professions [6]. In this article we are concerned with the negotiating of professional boundaries by the nursing and medical professions when it comes to the task of prescribing medicines.

Because prescribing has traditionally been the sole domain of the medical profession [7-9], the expansion of prescriptive authority to include nurses touches on issues of professional domains and competition between professions for jurisdiction over tasks. Jurisdiction or control over certain task areas is crucial for professions, because it is their means of continued livelihood [10]. Professionals who are recognized as experts in a certain area, in this case the area of prescribing medicines, typically possess a form of cultural capital whose ownership confers status and power [11]. Moreover, these professions often enjoy a number of privileges, such as control over professional training, recruiting and licensing [12]. Apart from the direct benefits, these help them to sustain their position in competition with other professions. Therefore, Abbott [12] labels jurisdiction – “the link between a profession and its work” (page 20) – as the central phenomenon of professional life.

Within jurisdictional domains, professions tend to make more or less exclusive claims to authority over the knowledge and skills that fall within their scope [13]. Knowledge claims play an important role in achieving jurisdictional control [11,14]. In this article, we adopt a broad understanding of knowledge claims as claims to unique bodies of knowledge and/or expertise. Because one profession can pre-empt another’s jurisdiction or control over a task, professions exist in an interdependent system with competing jurisdictional claims [12]. Consequently, when one profession aims to achieve more jurisdictional control in a certain task area, in this case the prescribing of medicines, other professional domain boundaries are inevitably affected as well [1].

In general, the relationship between the medical and nursing professions is referred to as the classical case of a dominant profession controlling a subordinate profession [12,15,16], even though it has been shown that on the

work floor role blurring and informal crossing of boundaries takes place between doctors and nurses [17,18]. Nonetheless, the medical profession seeks to maintain its dominant position in the provision of health care [14,19] whereas the nursing profession tries to increase its professional status. Porter [20] and Gerrish *et al.* [21] describe several strategies of occupational advancement used by nurses over the last years, such as managerialism and the introduction of Master level nurse education, both aimed at expanding nursing's scope of practice. The introduction of nurse prescribing can be viewed as a new chapter in the ongoing process of boundary negotiations between the medical and nursing professions. This is especially salient as prescriptive authority is seen by both professions as an important asset in maintaining and/or enhancing professional status [22].

In this article, we describe the introduction of nurse prescribing in the Netherlands from a sociology of professions perspective. Given the significance of jurisdiction in professional life, we focus on the knowledge claims made by the medical and nursing professions to secure or obtain, respectively, jurisdictional control over prescribing and related professional status. We examine what form these knowledge claims took and how they relate to the professional status of the professions involved. After all, knowledge claims are not mere rhetoric. They influence the everyday realities of professional status, interprofessional competition and jurisdictional division between professions.

### ***Professions, Knowledge Claims and Jurisdictional Control***

Even though much research has focused on professions, no comprehensive and generally accepted definition of the concept “profession” has been developed. We define professions as “exclusive occupational groups applying somewhat abstract knowledge to particular cases” (page 8) [12]. From this definition, it follows that knowledge and its degree of abstraction are important currencies of competition between professions. This is reflected in the strategies used by professionals to secure or obtain professional or expert status and jurisdictional control. As McLaughlin and Webster [11] state, professional knowledge claims play an important role in achieving jurisdictional control and expert or professional status, and they represent an important vehicle through which professions can rhetorically play out their professional struggles [14].

As said before, we examine the knowledge claims put forward by the medical and nursing professions in their struggle for authority over prescribing. These knowledge claims are not made in a vacuum [23]. Professions exist within a wider social structure in which for example the government creates the legislative framework in which knowledge claims can be made. Naturally, professions will (implicitly) adjust their claims with reference to this legislative framework. However, our focus is on the knowledge claims themselves and how they relate to the professional status of the professions involved. This means that we discuss the role of the state only where it actively influences the knowledge claims that were used. Moreover, we do not comment on the success of these claims in terms of some measurable outcome.

Professional competition over jurisdiction can have various outcomes [12]. After all, not every profession striving for full jurisdiction will obtain it. Most professional conflicts over jurisdiction result in so-called “limited jurisdictional settlements” (page 71) [12]. These are alternatives to the situation in which one or more professions hold full jurisdiction over a task. In a jurisdictional settlement, professions share the jurisdiction over a task, whereby control is to a greater or lesser extent equally distributed between the professions, depending on the type of jurisdictional settlement concerned. Abbott [12] discerns several jurisdictional settlements, including: subordination, whereby an incumbent profession controls the division of labor for one or more subordinate groups, and intellectual jurisdiction, in which the incumbent profession controls the cognitive knowledge of an area but allows practice by other professions. It is possible that in the course of a professional conflict, professions adjust the jurisdictional goal they are striving for, such as when professions believe that the goal of full jurisdiction is no longer attainable. This might be reflected in the knowledge claims they are using. The state is an important influencing factor in this regard, because it can change the laws and regulations under which professions develop and use their knowledge claims.

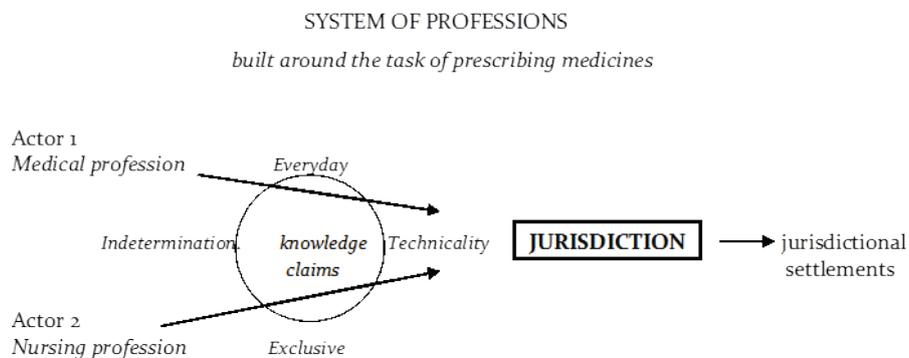
Although Abbott [12] in his definition of professions states that abstract knowledge is important for professional status, he does not say much about the form of knowledge. Professional knowledge, however, can take on multiple forms. The form it takes influences the strength of jurisdictional claims. Jamous and Peloille [24] introduced the indetermination/technicality ratio (I/T ratio) to conceptualize the notion of professional knowledge form, enabling knowledge to be placed along a continuum from highly technical to

highly indeterminate. The I/T ratio focuses on the transmissibility of knowledge; i.e., the part played in a production process by “means” that can be mastered and communicated in the form of rules (T), in proportion to the “means” that escape rules and are attributed to virtualities of producers (I) [24]. Hence, technicality refers to knowledge which can be codified, broken down into constituent tasks, rationalized and delegated. Think for example of the task of prescribing medicines based on medical guidelines and protocols. Indetermination is described as a skill associated with professional judgment, i.e., tacit knowledge, based on authority that is “acquired” through experience, ascription or initiation [11,14,24]. For example, prescribing medicines for frail elderly with multiple morbidity falls into this category.

A second distinction that is often made is between “exclusive” knowledge and “everyday” knowledge. Following Hirschhorn [14], we define exclusive knowledge as knowledge that is monopolized by and exclusively used by a particular professional group, whereas everyday knowledge is accessible to an undefined number of occupational groups and even to the lay public. This leaves us with a broad knowledge field, in which professional knowledge forms can be situated relative to their indeterminacy/technicality as well as relative to their level of exclusivity.

Figure 6.1 shows a partial graphic representation of interprofessional conflict over the task of prescribing medicines. It depicts the relationships between professions, their knowledge claims and jurisdiction. It should be emphasized that this is a partial representation, because the system of professions exists within a wider social structure.

Figure 6.1 Graphic and partial representation of interprofessional conflict over prescribing



When it comes to professional struggles for jurisdictional control, medicine and nursing are facing a dilemma as to finding a balance between technical and indeterminate knowledge claims and everyday and exclusive knowledge claims. If they account for their knowledge and subsequent practice too strictly in terms of technical complexity and rules (e.g., medical guidelines and protocols), they risk the possibility of being taken over by other professions [12,13,25]. On the other hand, if they claim that certain knowledge is indeterminate, meaning that only their profession is gifted with that particular knowledge, the door is by definition closed for others to claim that knowledge as well. However, too much emphasis on indeterminacy is also dangerous. After all, other occupational groups can claim equal or superior indeterminate skills over the task at stake. Moreover, knowledge claims that suffer from too high a level of indeterminacy, will fail to convince the audience of their legitimacy. The most effective professional claims therefore seem to consist of both technical and indeterminate knowledge [13,25]. It is also important for professions to frame their knowledge as exclusive knowledge. After all, everyday knowledge, i.e., knowledge that is accessible to many occupational groups and sometimes even to the lay public, can by definition not be claimed. Moreover, everyday knowledge is not beneficial toward enhancing professional status. Therefore, successful professional claims usually emphasize the exclusive character of the knowledge that they possess.

### ***The context of nurse prescribing***

Nurse prescribing in the Netherlands is regulated by two different articles of law, one for registered nurses and one for nurse specialists (Master's in Advanced Nursing Practice). At the time of writing, registered nurses are not yet allowed to prescribe medicines. Their prescriptive authority is regulated in article 36 of the Individual Health Care Professions Act, which states that prescriptive authority can only be granted to specific categories of registered nurses (Bachelor's degree) that are designated by a Ministerial Order. The categories of registered nurses that were initially designated to prescribe are diabetes care nurses, lung nurses and oncology nurses [26]. However, issues around the recognition of education are not fully secured yet. It is expected that diabetes care- and lung nurses will start prescribing in the course of 2013 and oncology nurses by January 1, 2014 [27]. They will be allowed to prescribe a limited number of medicines within set protocols and standards, after a diagnosis has been made by a doctor [26,28,29].

The legislation for nurse specialists came into force on January 1, 2012. Nurse specialists with a Master's degree in Advanced Nursing Practice have broader prescriptive authority than diabetes care nurses, lung nurses and oncology nurses will get, and their authority is related to their area of expertise (i.e., acute care, chronic care, intensive care, preventive care or mental health care). However, their prescriptive authority is part of the so-called experimental article (36A) in the Individual Health Care Professions Act. This means that nurse specialists are allowed to perform reserved procedures, including the prescribing of medicines, for an experimental period of 5 years. After a positive evaluation, a final settlement might be included in the law which will grant nurse specialists final authority to perform reserved procedures, including prescribing [30-32].

In the Netherlands, the prescribing of medicines was traditionally the exclusive domain of doctors. But since the beginning of this century, several reports have appeared that promoted task substitution in health care [33,34]. When nurse prescribing was for the first time discussed, several possible barriers to task substitution were reported, of which professional domain thinking was considered "the most persistent problem" (page 37) [34]. Hence, nurse prescribing is a development in which professional boundaries are disputed and jurisdictional control is at stake. In the years prior to the introduction of nurse prescribing, the medical and nursing professions actively tried to influence the public and policy debate. In this study, we examine the knowledge claims used by the medical and nursing professions to secure or obtain, respectively, jurisdictional control over the task of prescribing medicines.

## 6.2. Methods

Data were collected using a multi-method approach consisting of semi-structured interviews with stakeholders on nurse prescribing in the Netherlands and an extensive document analysis. Stakeholder interviews provided the primary source of data. We aimed to include representatives of all organizations that were involved in the nurse prescribing debate in the Netherlands. This included representatives of overarching nurses and medical associations as well as more specialist associations, such as the Association for Diabetes Care Professionals (EADV) and the Dutch College of General Practitioners (NHG). A list of key organizations was compiled in consultation

with experts on nurse prescribing from the Royal Dutch Medical Association (KNMG) and the Dutch Nurses' Association (V&VN). Potential informants were also selected in consultation with these experts and were approached by the researchers to take part in the study. Representatives received an information letter explaining the aims of the study, the voluntary nature of participation and an invitation to participate in an interview. Participant consent was assumed upon accepting this invitation and participation in an interview.

Of the 16 representatives invited per email and telephone, 13 ultimately participated (see Table 6.1 for a list of all interviewed stakeholders). Twelve interviews were with a single informant and one was with two representatives of one organization interviewed together. The informants held policy- or board positions within their organization, and their answers represent the organization's point of view. Every interview was conducted by one or two researchers (MK, LVD, PG and/or AF) who were trained in qualitative interviewing techniques. The interviews were semi-structured and were guided by a topic list that was drafted after the findings of an earlier systematic review of the literature on nurse prescribing [35]. Interview topics were: general information about the informant/organization, vision on nurse prescribing, degree of support for nurse prescribing, introduction of nurse prescribing, the legal-, educational- and organizational conditions for nurse prescribing, and challenges and threats to the work of doctors and nurses because of nurse prescribing. All interviews but one were recorded and a summary of the interview was sent to each representative to be edited, where necessary, as an accurate representation of the organization's viewpoint. Representatives could mark sections of the interview summary as 'off the record', in addition to sections they already noted as 'off the record' during the interview itself. All 'off-the-record' requests (n=2) were granted in full. One interview was conducted by letter, at the request of the organization. The approved interview summaries formed the basis for analysis.

Table 6.1 List of interviewed stakeholders

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**Nursing associations**

Dutch Nurses' Association (V&VN)  
Association for Diabetes Care Professionals (EADV)  
Association of Nurse Specialists (V&VN VS/NP)  
Association of Lung and Oncology Nurses (V&VN L/O)

**Medical associations**

Royal Dutch Medical Association (KNMG)  
National Association of General Practitioners (LHV)- written  
Dutch College of General Practitioners (NHG)  
Netherlands Association of Internal Medicine (NIV)- telephone interview  
Dutch Association of Elderly Care Specialists (Verenso)

**Other stakeholders**

Health Care Inspectorate (IGZ)  
Royal Dutch Pharmacists Association (KNMP)  
Ministry of Health, Welfare and Sport (VWS)  
Dutch Patients and Consumers Federation (NPCF)

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No ethical approval was deemed necessary for this study as the information that was collected did not refer to peoples' individual opinions or behaviors but exclusively to organizational points of view concerning nurse prescribing. However, all informants consented that the approved interview summaries, in which their organizations were mentioned by name, could be used in research publications. Moreover, all informants were informed that they could withdraw from the study at any time during or after the interview. All data collected were handled as required by the rules of the Dutch Data Protection Act (Dutch: Wbp- Wet bescherming persoonsgegevens) and the applicable codes of conduct for scientific researchers. Raw data (i.e. the approved interview summaries) are available upon request from the first author, but only after permission from the organization concerned has been obtained.

In addition to stakeholder interviews, document analysis provided information that was used to supplement data collected through interviews. Considerable effort was made to obtain relevant documents, such as policy documents, position papers, newspaper articles, letters to the Minister of Health, and government documents regarding nurse prescribing, from various sources. These sources included the websites of the associations that were interviewed, digital archives of their professional journals, digital government archives and the LexisNexis database of national newspaper articles. Because

most of these websites lacked advanced search facilities, we used combinations of the following keywords, where possible, to search for relevant documents from the last 10 years: “prescriptive authority”, “nurses”, “nurse specialists”, “prescribing”, “medicines” and “task substitution”. For government archives, the additional search terms “32.196” and “32.361” were used, because these were the numbers of the (draft) bills on prescriptive authority for nurses. Documents selected for inclusion were searched manually to identify further relevant documents. We included all documents in which knowledge claims were expressed by either (a representative of) the medical profession, the nursing profession, or both; where these knowledge claims referred to (the introduction of) nurse prescribing; and where there was no question of individual views. We included a total of 34 documents in the study. The oldest document included dates back to 2003, but the majority of retrieved documents was from recent years.

We performed a thematic analysis of the approved interview summaries and documents gathered through the document analysis [36]. Data analysis began at an early stage in the research to introduce any necessary changes in the interview protocol. Data were coded using MAXQDA 2007 qualitative data analysis software [37] and were analyzed both inductively and deductively. Guided by our theoretical model, we searched the data for concepts that were directly linked to interprofessional tensions around nurse prescribing. Additionally, data were analyzed inductively and compared for common statements and claims. Subsequently, recurring themes were identified and classified, and text fragments were sorted according to the thematic framework. Three of the researchers took part in internal discussions of the analysis and themes were discussed until consensus was reached. Analysis of the data identified the following thematic elements: illegal nurse prescribing, professional domains, (exclusive) task/knowledge area doctor/nurse, preconditions for nurse prescribing, protocols/guidelines, comorbidity/polypharmacy and routine aspects of prescribing. Based on these themes, we distinguished the knowledge claims used by the nursing and medical professions. Quotations were chosen to illustrate the knowledge claims. It should be noted that these quotations came from the interview summaries that were approved by the interviewees.

Our study has largely been reported according to the COREQ guidelines [38], see Appendix 6.1.

### 6.3. Results

#### ***Knowledge claims by the nursing profession***

The main argument of the nursing profession in seeking prescriptive authority was that nurses were already prescribing medicines, albeit on an illegal basis. This claim was repeatedly cited by all nursing organizations that were involved in seeking prescribing rights, implying that it would only be logical to grant nurses legal prescribing rights as well. After all, nurses had proven to be competent to prescribe. The Dutch Nurses' Association (V&VN) put it like this in their interview with us:

*The pragmatic question for prescribing rights came from the nursing profession itself. From the field, more and more signs emerged that certain groups of nurses, although unauthorised, nonetheless often prescribed medicines.*

The newsletter from the Association for Diabetes Care Professionals (EADV) of March 2007 was also explicit in this regard:

*V&VN has been pleading for a long time already to formalize nurses' position in the administration of drugs. For years, nurses have been prescribing medicines without having the competence to do so [39].*

Moreover, in our interview with a representative of the Dutch association for lung nurses (V&VN Longverpleegkundigen) it was stated that prescribing by nurses was "a daily practice".

The fact that nurses were already prescribing medicines, despite the lack of a legal framework, had long been openly acknowledged by all parties involved. Even the Royal Dutch Medical Association (KNMG) acknowledged this in their interview with us by mentioning that in practice, diabetes care nurses, lung nurses and oncology nurses "already prescribe together with the relevant doctor". However, once the idea of legal nurse prescribing was mooted, these existing prescribing practices became an important factor for the nursing profession to plead for official prescribing rights. The profession wanted recognition for the work nurses had already been doing for years. They wanted to be recognized as prescribers.

By repeatedly referring to the fact that nurses were already prescribing medicines in daily practice, however, the nursing profession (unintentionally) emphasized the everyday knowledge character of prescribing, or at least the

everyday knowledge character of that part of the prescribing task for which they were claiming jurisdiction. After all, nurses were not prescribing all medicines, they had only “learned” part of the prescribing job. They were now claiming legal jurisdiction over precisely that part of the prescribing task that they had themselves shown to be susceptible to incursion. Although this can be a pragmatic claim for obtaining legal prescribing rights, it is a much weaker argument in nurses’ search for (more) professional status, because it strongly emphasizes the everyday knowledge character of the task and the technicality side of the I/T ratio.

A second related claim that was constructed and repeatedly put forward by the nursing profession to acquire legal prescribing rights was that the introduction of nurse prescribing would do justice to nurses’ skills and expertise. Sometimes, it was even claimed that nurses were better at prescribing than doctors, because nurses had a better view of patients and could “see how someone stands in life”. The president of the Dutch Nurses’ Association (V&VN) repeatedly summarized the “crucial role” that nurses played in the administering and prescribing of medicines, stating that a nurse:

*(..) has good contact with him [the patient], observes him well, writes a prescription face to face, provides information, can immediately answer questions and can monitor the use, effects and side-effects of the medicine. Nowadays, these things do not happen enough, the doctor has too little time to do it [40].*

Moreover, in an open letter to a major Dutch newspaper (NRC Handelsblad), the president of the Royal Dutch Medical Association and the president of the Dutch Nurses’ Association in 2010 jointly wrote that:

*Many tasks in health care can be performed better by nurses and nurse practitioners than by doctors [41].*

The president of the Association for Diabetes Care Professionals (EADV) in her interview likewise claimed that “the diabetes care nurse is the expert in the field of adjusting and regulating insulin”. So, besides pointing out that nurses were already prescribing medicines, the nursing profession explicitly represented nurses as “the experts” in prescribing medicines. The profession underpinned this claim to exclusive knowledge by stating that nurses were

providing doctors with medication advice. Moreover, the profession argued that nurses believed they had a better understanding of patients than doctors. This is evident in the following quote from our interview with the Dutch Nurses' Association (V&VN):

*Moreover, it came to the fore that nurses had the idea that they had a better view on patients than the doctor or general practitioner, because they have a much broader view and, for example, can see how someone stands in life.*

Because these claims hinge on the exclusive talents of nurses, they emphasize the indeterminate character of nursing knowledge. Hence, this is a stronger claim in nurses' quest for (higher) professional status, because it emphasizes the exclusive talents of nurses.

### ***Knowledge claims by the medical profession***

When nurse prescribing was first discussed in the Netherlands as a realistic possibility in health care, the medical profession was outspoken in opposing the proposal. The medical profession proclaimed that the prescribing of medicines should be "reserved to doctors" [42], among others because it feared prescribing errors and the loss of coherence in patients medication policy.

Initially, the medical profession's main angle of resistance focused on prescriptive authority for registered nurses, i.e., diabetes care nurses, lung nurses and oncology nurses. The medical profession emphasized that these categories of nurses were not legally identifiable, because their specialization (diabetes, lung and oncology care) cannot be laid down in law, because the law only contains the category "registered nurse". Therefore, it would likewise be impossible to identify these groups of nurses as legal prescribers, and accordingly they should not be granted prescribing rights. Furthermore, the medical profession was concerned about their lack of diagnostic skills and knowledge of comorbidity and polypharmacy. According to the medical profession, "only a doctor is capable of diagnosing" (page 8) [43] whereas nurses lack the broad integral knowledge and skills to take comorbidity and polypharmacy into account. Hence, the medical profession emphasized the indeterminate character of the knowledge, i.e., medical knowledge, required for prescribing. The following illustrative quote is from an interview with the Dutch National Association of General Practitioners (LHV):

*When prescribing medicines, interactions with other medicines may develop. The specialized nurse lacks the polypharmaceutical knowledge that is needed to oversee complications caused by polypharmacy.*

Gradually, however, a change in claims can be discerned. In 2006 for example, the title of a news article on the website of the umbrella medical organization (KNMG) read “Nurse prescribing finds favor in the eyes of the KNMG” [44]. Even though this heading revealed an authoritative stance, it also showed, albeit unwillingly, a slightly more positive outlook on nurse prescribing. Moreover, it should be noted that within the medical profession, there was less resistance against prescriptive authority for nurse specialists (Master’s in Advanced Nursing Practice), with the exception of the general practitioner associations, who claimed, among other things, that the proposed legislation for nurse specialists contained too little conditionality to guarantee the safety of prescribing. The Dutch College of General Practitioners (NHG) mentioned in their interview with us that because of the legislation:

*The need for consultation [between a doctor and nurse specialist] falls away and cooperation agreements lose their obviousness.*

Over time, part of the medical profession altered its claims and started to claim that a small part of the prescribing task could be done by nurses as well. Where “routine tasks” and prescribing based on measured values were concerned, and where cooperation with a doctor would be guaranteed, the medical profession believed that prescribing by nurses could be feasible, albeit for a limited number of medicines. In 2010 the Dutch National Association of General Practitioners (LHV), for example, stated that prescribing by diabetes care nurses and lung nurses would not be a problem, because they would “only prescribe on the basis of measured results” (page 8) [43]. The quote below from our interview with the Dutch Association of Elderly Care Physicians (Verenso) also describes this stand:

*Regarding the prescriptive authority for nurse specialists, Verenso is of the opinion that nurses should prescribe by treatment protocols in which medication quantities etcetera should be specified.*

The following quote from an article by the Royal Dutch Medical Association (KNMG) from 2011, relating to nurse specialists, likewise reflects the tentative

nature of the medical profession's agreement with task substitution to nurses and especially nurse prescribing:

*The KNMG also thinks that in the additional rules [to the law] at least the following should be regulated to ensure the quality of care: national guidelines for indicating and performing certain medical procedures, cooperative arrangements between the relevant professionals and doctors and the condition that task substitution takes place only for routine tasks for which the risks are sufficient to grasp [30].*

It is clear that the medical profession gradually became less negative about nurse prescribing and started to see some room for (limited) nurse prescribing right. However, it should be noted that the part of the prescribing task that the medical profession was willing to share and/or hand over to nurses, was reduced to a task almost exclusively built on technical (T) knowledge. After all, prescribing based on measured values, guidelines and protocols is characterized by a high level of codified knowledge that can be mastered and communicated in the form of strict rules.

From the interviews and document analysis, it seems that the medical profession quite early on in the process believed it would be wiser to put its energy into arranging nurse prescribing in such a way that the outcomes would be as beneficial as possible for itself, instead of continuing to resist it. The Royal Dutch Medical Association (KNMG), for example, mentioned in their interview with us that:

*One of the conditions that the KNMG would then have liked to include in the law, but for which she was unable to raise sufficient support in the House of Representatives, was that nurse specialists would be required to prescribe within a mandatory partnership, including at least one physician.*

And in 2006 already, a negative KNMG comment about how task substitution was legally regulated, was followed by the sentence:

*Anyhow, it now comes down to the point that the conditions under which [nurse] prescribing can take place, are in place [45].*

Throughout the years, the medical profession repeatedly made this kind of fatalistic comments, almost always followed by statements underlining the

importance of a proper arrangement of the conditions under which nurse prescribing should be introduced.

Increasingly, the medical profession emphasized that nurse prescribing should be based on protocols and guidelines that should be developed by the professional groups, i.e., registered nurses and nurse specialists, and doctors together, again stressing the value they placed on technical knowledge. In an open letter to the Chairperson of the Dutch House of Representatives the Royal Dutch Medical Association (KNMG) in 2011, for example, wrote that prescribing should be performed using “written cooperative arrangements between the professionals involved in the task reallocation” (page 3) [46], and the Dutch National Association of General Practitioners (LHV) claimed that specific protocols should be drafted by “the concerned professional groups” (page 8) [43]. By focusing on the medical profession’s crucial role in the drafting of new protocols and guidelines for nurse prescribers, the profession tried to retain intellectual jurisdiction over prescribing.

#### **6.4. Discussion**

In the debate on nurse prescribing in the Netherlands, both the nursing and medical professions used various knowledge claims to obtain or secure, respectively, jurisdictional control over prescribing. These knowledge claims were closely connected with their professional boundaries, professional status and the kind of jurisdictional control they were aiming for.

The claim of the nursing profession that nurses were already prescribing medicines, albeit on an illegal basis, was pragmatic in terms of obtaining legal prescribing rights and the expansion of nurses’ professional boundaries, but less effective for enhancing their professional status. After all, it showed that the particular part of the prescribing task that nurses were claiming jurisdiction over, was built up of technical knowledge that could easily be taken over by other professionals. The other main knowledge claim of the nursing profession – that nurses were the experts on prescribing – might have been less pragmatic in terms of actually expanding the boundaries of the nursing profession, because it is a claim that is difficult to demonstrably substantiate, but it was more appropriate in aiming for professional status enhancement, because professionals who are recognized as experts in a certain area typically possess status and power [11].

The medical profession initially insisted that nurses should not be granted prescribing rights, because one needs a broad medical vision to prescribe. By focusing on the indeterminate character of prescribing knowledge, the medical profession stubbornly tried to defend its professional boundaries and keep full jurisdiction over prescribing of medicines. However, in the course of the debate, the claims used by the medical profession changed and appear to have been aimed toward other jurisdictional goals. The medical profession started to see room for limited nurse prescribing rights and started to emphasize the technical and routine character of the prescribing tasks that nurses could perform. This professional strategy, in which nurses' work is denoted as "routine", is not uncommon. Sanders and Harrison, for example, showed that both geriatricians and GPs employed a discourse that strongly emphasized the routine elements of specialist heart failure nursing work. By contrasting their own work with the routine tasks performed by these nurses, geriatricians and GPs tried to emphasize the autonomy of their own role [2]. Hence, the medical profession gradually allowed a shift in its own professional boundaries, by allowing nurses to prescribe as well. However, at the same time the profession tried to secure its own professional status and minimize the enhancement of nurses' professional status. After all, routine tasks are a target for deprofessionalization, as Abbott [12] states, and by delegating the "dangerous" routine part of the prescribing task to nurses, the result might be "the degradation of what had been professional work to nonprofessional status" (page 126) [12]. Additionally, by claiming that nurses should only prescribe via guidelines and protocols that were developed in collaboration with doctors, the medical profession skillfully defended its own professional status by aiming for intellectual jurisdiction over prescribing.

The fact that the medical profession gradually changed its knowledge claims and its jurisdictional aims, is not unique for a debate in the Netherlands, as the American historian Kennedy [47] showed. In his analysis of the creation of Dutch euthanasia law, he showed that even prior to the introduction of euthanasia legislation, it was already openly stated that (illegal) euthanasia requests were sometimes granted. In this climate of open discussion, the eventual liberalization of euthanasia became an inevitable development in the eyes of many, and even critics and opponents believed they would do better to focus on an adequate regulation of this inevitable practice instead of continuing to resist it [47]. It is quite possible that the medical profession in the Netherlands believed the same when it saw itself confronted with the open discussion about nurses prescribing medicines, even though this was

officially prohibited. Instead of resisting the introduction of nurse prescribing, the medical profession aimed for adequate regulation and tried to preserve its intellectual jurisdiction.

Moreover, it should be noted that professions, implicitly or explicitly, adjust their claims to the legal framework in which they are operating. In the Netherlands in recent decades, policy makers as well as successive governments adopted an increasingly favorable attitude to task substitution, whereas the legal possibilities for task substitution were extended. Together with the open discussion climate in the Netherlands, this might have contributed to the medical profession's outlook on nurse prescribing as an inevitable development and might have influenced its knowledge claims.

Although we provide insight into how the form of knowledge claims can influence jurisdictional conflicts at the level of professional associations, we cannot make any statements about how these claims will affect the division of jurisdictional control on the work floor. As Abbott notes, the work floor is a separate jurisdictional arena, and claims made in the workplace often distort the official lines of legally and publicly established jurisdiction [2,12], as was for example shown by Allen [17] and Snelgrove and Hughes [18] in their studies on role blurring and informal boundary crossing between doctors and nurses. Nonetheless, considering that struggles take place on organizational level between the nursing and medical profession concerning prescribing, our study suggests that good communication will be an important factor in the successful introduction of nurse prescribing in practice. Moreover, we did not evaluate the knowledge claims used on their factual accuracy. We wanted to examine what medicine and nursing claimed as their knowledge and why. By the same reasoning, we did not comment on the success of these knowledge claims in terms of some measurable outcome. Whether knowledge claims were based on facts, to what extent they held true, and to what extent they were successful was irrelevant for this study, although these are interesting questions for further research.

Even though we studied knowledge claims used by two specific professions in their particular quest for jurisdictional control over prescribing of medicines, our study is of wider interest in the context of contemporary health care policy. Nurse prescribing has been introduced in eight Western European and Anglo-Saxon countries over the past two decades [35,48], resulting in increasing professional boundary negotiations between medical and nursing professions internationally. For example in Australia, Sweden and the USA, medical associations mainly opposed nurse prescribing and in Spain, which is

currently in the process of introducing nurse prescribing, the General Council of Physicians is against granting nurses the legal authority to prescribe medicines [4,49-51]. Medical and nursing professions in these countries are competing with each other over the jurisdiction over prescribing and in the process likewise make use of knowledge claims.

Moreover, the prescribing of medicines is by no means the only task substitution that is taking place. Task substitution is increasingly seen as a solution to current problems in health care, for example in the Netherlands [33,34] but also internationally [2,52,53]. In the light of these developments, professional boundaries are and will be increasingly contested. As a result, professions will be forced to develop knowledge claims to defend their established jurisdictions, obtain new jurisdictions and redefine their professional status. Because after all, jurisdiction is the central phenomenon of professional life [12].

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**Domain 1: Research team and reflexivity**

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***Personal characteristics***

It is reported that every interview was conducted by one or two researchers (MK, LvD, PG and/or AF) who were trained in qualitative interviewing techniques

Credentials of all researchers are reported to PLOS ONE.

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The authors' occupations are not reported. The first author is PhD researcher at NIVEL. The second author is Programme coordinator Pharmaceutical care at NIVEL. The third author is Director at NIVEL and Professor at Utrecht University. The fourth author is Programme coordinator Nursing care at NIVEL and Professor at VU University Amsterdam.

It is reported (by first names) that the third author is male and that the first, third and fourth authors are females.

***Relationship with participants***

No relationship was established with informants prior to study commencement.

It is reported that all participants were informed with an information letter about the purpose of the study. Additionally, the study was explained at the time of interview.

Participants were informed that they were free in their answers and that there were no 'good or wrong answers'.

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**Domain 2: Study design**

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***Theoretical framework***

It is reported that our data were analyzed with thematic analysis.

***Participant selection***

It is reported that a list of key organizations was compiled in consultation with experts on nurse prescribing from the Royal Dutch Medical Association (KNMG) and the Dutch Nurses' Association (V&VN). Potential informants were also selected in consultation with these experts and were approached by the researchers to take part in the study.

It is reported that potential representatives received an information letter explaining the aims of the study and were subsequently invited by email and/or telephone to participate in the study.

It is reported that the sample consists of 13 representatives.

It is reported that of the 16 representatives invited, 3 representatives did not participate.

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Appendix 6.1 - To be continued -

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**Domain 2: Study design**

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***Setting***

Data were almost always collected at the offices of the respondents.

At interviews, no one else except the interviewee(s) and interviewer(s) were present.

All important characteristics of the sample are reported.

***Data collection***

Development of the questionnaire is discussed.

It is reported that participants were interviewed once.

It is reported that the interviews were audio-taped.

Field notes were not taken as the interviews were audio-taped.

Interview times are not discussed.

Data saturation is not discussed.

It is reported that a summary of the interview was sent to each representative to be edited, where necessary, as an accurate representation of the organization's viewpoint.

The approved interview summaries formed the basis for analysis.

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**Domain 3: Analysis and findings**

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***Data analysis***

It is reported that three of the researchers took part in internal discussions of the analysis (MK, LvD, AF).

No coding tree is reported.

It is reported that the themes were derived both inductively and deductively.

It is reported that data were coded using MAXQDA 2007 qualitative data analysis software.

Participants did not provide feedback on findings. This is not mentioned.

***Reporting***

Quotations were chosen to illustrate the knowledge claims. It should be noted that these quotations came from the interview summaries that were approved by the interviewees. For each quotation, the source is reported.

There is consistency between the data presented and the findings.

The results section is structured according to the major themes found in the data.

There is no description of diverse cases and minor discussion of minor themes.

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# 7

## **Changes in nurses' views and practices concerning nurse prescribing between 2006 and 2012: results from two national surveys**

Published as:

Kroezen M, de Veer A, Francke AL, Groenewegen PP, van Dijk L. Changes in nurses' views and practices concerning nurse prescribing between 2006 and 2012: Results from two national surveys. *Journal of Advanced Nursing*, doi: 10.1111/jan.12404.

## **Abstract**

### **Aims**

To assess changes in the prescribing practices and views about nurse prescribing of Registered Nurses in the Netherlands between 2006 - 2012.

### **Background**

Considering the developments that took place in the Netherlands between 2006 and 2012, such as increased opportunities for nurse prescribing education and stricter control of nurses' prescribing practices, this study examines the extent to which nurses' prescribing practices and views have changed in the intervening years. In both years, nurses were not legally allowed to prescribe.

### **Design**

Survey study.

### **Methods**

Surveys were conducted in 2006 and 2012. Questionnaires were sent to a national sample of nurses. The questionnaires addressed nurses' views on nurse prescribing and the extent to which nurse prescribing took place in the respondents' work setting.

### **Results**

There were 386 and 644 respondents to the 2006 and 2012 surveys, respectively. The proportion of nurses who said they felt adequately equipped to prescribe medicines remained constant around twelve percent. Insufficient knowledge to prescribe remained the most important reason for feelings of inadequacy. More than a quarter of the nurses in both surveys stated that nurses in their team sometimes write prescriptions. There were few changes in views on the consequences of nurse prescribing for nurses' practice.

### **Conclusion**

Overall, nurses' support for nurse prescribing remained stable at a fairly cautious level, while the number of nurses feeling inadequately equipped to prescribe remained high. As nurse prescribing is expected to improve the quality and continuity of care, this should be taken into account in policy expectations.

## 7.1. Introduction

The number of countries where nurses are legally permitted to prescribe medication has grown considerably in recent decades [1-4]. In 2014, specific categories of Registered Nurses (RNs) in the Netherlands will also be granted legal authority to prescribe medicines (Box 7.1). Much is expected of nurse prescribing in the current climate of cost containment in health care. In the UK, for example, it has been claimed that many of the quality targets set by the Department of Health for the primary care setting will rely on nurses taking on new roles [5] and in the Netherlands, nurse prescribing is being introduced to contribute to efficient and effective patient care and to improve the quality and continuity of care [6,7].

The implementation of healthcare policy in practice, in this case of nurse prescribing, is influenced by various factors, including healthcare professionals' individual attitudes [8]. It is known that in the nursing profession, there is an ongoing debate about whether prescribing is something that nurses should be doing [9]. Part of the nursing profession feels that nurse prescribing shifts the focus too much from care to cure and believes prescribing to be outside the parameters of nursing practice [10-13]. This is confirmed by research showing that the uptake of the nurse prescribing role can be variable [5]. Moreover, while questions have been raised about whether nurses are sufficiently prepared for prescribing by current educational programs [14-16], other research has shown that nurses prescribe in comparable ways to physicians [17] and that educational programs for nurse prescribing are operating largely satisfactorily [18].

Little is known about the extent to which nurses' attitudes towards nurse prescribing are being influenced by changes in policy and (increased) education possibilities and to what extent beliefs about what a nurse is and if and how prescribing fits into that role are steady over time. This is important to study, as the debate in nursing may have consequences for the intended effects of nurse prescribing as formulated by policymakers and professional associations. After all, if a large section of the nursing profession does not support the idea of nurse prescribing and does not make use of the authority to prescribe, this may lead to a significant gap between the actual and intended outcomes of nurse prescribing. In 2006, we performed a national survey among RNs in the Netherlands concerning their views on nurse prescribing and prescribing practices [19]. To determine whether and how

nurses' views and practices concerning nurse prescribing are subject to change over the years, we repeated our survey in 2012.

Box 7.1 Nurse prescribing for specific categories of RNs in the Netherlands as per November 2013

- Section 36 (14) of the Individual Healthcare Professions Act states that the authority to prescribe prescription-only medicines can be granted to specific categories of RNs that are designated by a Ministerial Order.
- Categories of RNs designated by Ministerial Order as authorized to prescribe prescription-only medicines are only allowed to prescribe after a diagnosis has been made by a doctor [38,39].
- Categories of RNs designated by Ministerial Order as authorized to prescribe prescription-only medicines can only prescribe a limited number of medicines within their specialism as specified within protocols and standards [38,39].
- The categories of RNs that are initially designated by Ministerial Order as authorized to prescribe medicines are diabetes care nurses, lung nurses and oncology nurses [38]. However, this Ministerial Order has not yet taken effect. In future, the Minister of Health can assign prescriptive authority to further categories of RNs by Ministerial Order.
- To be allowed to prescribe, RNs who fall in one of the designated categories must hold a Bachelor's degree and they must have successfully completed a Pharmacotherapy module at a university of applied sciences. Universities of applied science are responsible for the content of this module and they must ask the Dutch Ministry of Health for approval. Most Pharmacotherapy modules consist of a three-day training, with a total study time of approximately 70 hours. Costs are paid either by the nurse or employer and vary from 650 to 925 euros, depending on educational institution. To be allowed into the Pharmacotherapy module, RNs must have successfully completed nursing education at Bachelor degree level, be registered as a nurse in the BIG register, have at least two years of relevant clinical nursing experience, have a training place and supervisor in their work environment and work at least 18 hours a week as RN. The content of the module is fairly similar across all educational institutions, including: legislation on nurse prescribing, pharmacokinetics, pharmacodynamics, models for choosing and prescribing medicines, ethical aspects, medication adherence, patient perspective and medication safety (e.g. [40,41]).
- It is expected that diabetes care- and lung nurses will be authorized to start prescribing by February 2014 and oncology nurses by September 2014 [42].

## 7.2. Background

According to Abbott [20], professional discussions about boundaries and task shifting, in this case concerning the prescribing of medicines, are shaped by

various internal and external forces. Internal forces can be characterized as forces arising from within the professions themselves, whereas external forces relate to broader developments in society. An example of an internal force that may shape the professional discussion in nursing about prescribing rights is nurses' desire for more professional autonomy, whereas governmental striving for a more cost-effective healthcare system might be considered as an external force.

In this paper, we compare Dutch nurses' views and practices concerning prescribing between 2006 and 2012. It should be noted that in 2006, Dutch RNs were not legally allowed to prescribe medicines, but it was well known that some RNs were already prescribing some medicines [21-23]. Through the so-called 'extended arm' construction, physicians delegated the act of prescribing to nurses, but retained responsibility. In most cases, delegation only took place for a small number of relatively harmless medicines. Even though this practice took place by mutual consent between doctors and RNs, it was undesirable both legally and professionally [24,25], making it one of the main reasons for the forthcoming introduction of prescriptive authority for Dutch RNs [21-23]. This sort of 'tolerance situation' is not uncommon in the Netherlands and can be found in other areas of practice as well [26].

Since 2006, developments took place that might have influenced RNs' views on nurse prescribing as well as their prescribing practices. Some external forces that might have shaped the professional debate in the Netherlands about nurse prescribing relate to the fact that nurse prescribing was introduced in two more European countries, Ireland and Finland and that several predominantly positive evaluations emerged from the UK and Ireland [2,18]. These events all generated positive attention from the Dutch Nurses' Association (V&VN) [27]. More importantly, the new Dutch Medicines Act (Dutch: *Geneesmiddelenwet*) came into force on July 1, 2007 and the prescribing of medicines was added as a new reserved procedure to Section 36 of the Individual Healthcare Professions Act (Dutch: *Wet op de beroepen in de individuele gezondheidszorg*) [28]. This created the legal opportunity to grant independent prescriptive authority to specific categories of nurses. However, to be able to actually prescribe medicines in practice, RNs still had to wait for the Ministerial Order to take effect that allocates prescriptive authority to specific categories of nurses. Nonetheless, the ensuing public debate about the introduction of nurse prescribing also drew growing attention to the existing illegal situation, resulting in increased monitoring of compliance with the rules by the Dutch Health Care Inspectorate [29] and possibly making RNs

more aware of the illegality of their prescribing practices at that time. The Ministerial Order that designated the first categories of RNs to be allowed to prescribe drugs was passed in 2012, but has not come into effect yet (see Box 7.1). Nonetheless, this means that unlike in 2006, when there was still much uncertainty about the particulars of the planned introduction of nurse prescribing, in 2012 all the legal and organizational details of RNs' prescriptive authority were known.

Forces arising from within the nursing profession itself might also have influenced the professional debate about nurse prescribing in recent years. Since 2006, nurse prescribing courses have been developed by several universities of applied sciences in the Netherlands and the Dutch Nurses' Association has organized numerous information meetings about nurse prescribing. To examine whether these developments have changed nurses' practices and views concerning nurse prescribing, we compare RNs' prescribing practices and views in 2006 with their practices and views in 2012. We focus in particular on RNs' views concerning the influence of nurse prescribing on their workload, on the attractiveness of their work and on the opportunities for training and further development, as these aspects have a major impact on the potential uptake of nurse prescribing in practice.

### **7.3. The study**

#### **7.3.1. Aim**

The aim of the study was to examine whether Dutch Registered Nurses' prescribing practices and views changed between 2006 and 2012. The following research questions were addressed:

1. Do RNs feel adequately equipped to prescribe medicines?
2. How often and in what manner do RNs in nurses' work situations prescribe medicines?
3. What are the views of RNs regarding the consequences of nurse prescribing for nurses' practice?

Based on the developments that took place in the Netherlands between 2006 and 2012 as described above – i.e. the increased opportunities for nurse prescribing education, the stricter control of nurses' prescribing practices pending the introduction of legal nurse prescribing, and the increased

information about the final form prescriptive authority would take – we formulated the following hypotheses:

*Hypothesis 1:* RNs in 2012 feel better equipped to prescribe medicines than in 2006.

*Hypothesis 2:* The number of RNs writing ‘illegal’ prescriptions in 2012 is smaller than in 2006.

*Hypothesis 3:* RNs hold more positive views on the consequences of nurse prescribing in 2012 compared to 2006.

### **7.3.2. Design**

To answer our research questions, we conducted a national survey among RNs in the Netherlands in both 2006 and 2012.

### **7.3.3. The instrument**

The survey questionnaire was developed by De Veer *et al.* in 2006 to measure whether nurses felt adequately equipped to prescribe medicines, what their views were on the intended changes to the legislation concerning nurse prescribing and whether nurses in their team were already prescribing medicines. For reasons of comparison, it was felt to be important that similar questions were asked in the 2012 survey. Hence, questions were posed in the same way and had the same answer categories in the 2012 survey as in the 2006 survey. A copy of the questionnaire is available from the first author.

The first part of the survey asked for general background information about respondents, including respondents’ completed education, the type of institution where they were employed and whether they had undertaken or planned to take the ‘Pharmacotherapy’ module required for prescribing. Subsequently, survey questions addressed the extent to which nurse prescribing took place in the RNs’ work setting, the extent to which RNs felt adequately equipped to prescribe medicines and their reasons for feeling thus and general views on nurse prescribing. The questions were predominantly multiple-choice, although there were also some open questions. Statements were positively and negatively worded to avoid response set bias. To prevent confusion, any potentially unknown terms were explained in the questionnaire.

### **7.3.4. Participants**

Questionnaires were sent to members of the Nursing Staff Panel (Dutch: *Panel Verpleging & Verzorging*) in 2006 and 2012. The Nursing Staff Panel is a

national sample that is representative of nursing staff in the largest healthcare sectors in the Netherlands, i.e. hospitals, mental health care, care for disabled people, home care, nursing homes and homes for the elderly. The age and gender distribution of the panel members corresponds to the age and gender distribution of the Dutch nursing staff population. Participation is voluntary and anonymous. For our studies, all panel members who were RNs (in 2006, n=500; in 2012, n=943) were invited to participate in the survey. Until 1997, Dutch RNs were educated through in-service training. Currently, RNs are educated to two different levels: nurses educated to associate degree level (3 - 3.5 years of professional training, equivalent to a UK foundation qualification) and nurses educated to Bachelor's degree level (at least 4 years of professional training). Both levels are represented in the panel. It should be noted that when our study was conducted, none of the participating RNs had legal authority to prescribe medicines yet. Nurse specialists (with a Master's degree in Advanced Nursing Practice) were excluded from this study because their professional qualifications and associated prescriptive authority, are different and regulated by a different article of law.

#### **7.3.5. Data collection**

In 2006, Nursing Staff Panel members received a first copy of the questionnaire, accompanied by a cover letter, by post. Reminders were sent 14 days and 28 days later. In 2012, we used a mixed-mode survey approach. Members of the Nursing Staff Panel with a registered email address were initially contacted by email, but those who failed to respond within one week and those without a registered email address were subsequently sent a first copy of the questionnaire, accompanied by a cover letter, by post. Afterwards, non-respondents received up to two reminders, approximately 14 and 28 days later.

#### **7.3.6. Ethical considerations**

The content of the questionnaire raised no substantial ethical issues. Study participation was voluntary and responses were anonymous and could not be traced to individual healthcare professionals, as was explained to participants in the cover letter that accompanied the questionnaire. Participant consent was assumed upon return of a completed questionnaire. Personal data were handled confidentially and processed anonymously as required by the rules of the Dutch Data Protection Act (Dutch: *Wbp- Wet bescherming persoonsgegevens*) and the applicable codes of conduct for scientific researchers.

### **7.3.7. Data analysis**

As the Nursing Staff Panel is a rotating panel, there is some but not complete overlap between the 2006 sample and the 2012 sample. Hence, our samples cannot be considered completely independent or dependent. In our analyses, we controlled for clustering of respondents between both samples by using the Stata command 'vce'. This command computes standard errors that are robust to correlation. Descriptive analyses were used to compare the background characteristics of participants in 2006 and 2012. Whether nurses felt adequately equipped to prescribe medicines and their reasons for feeling thus, was assessed using nine dichotomous items. Differences in percentage points between the 2006 and 2012 samples were tested for significance ( $p \leq 0.05$ ) using logistic regression, controlling for age and health care sector. Standard errors were corrected for clustering at the respondent level.

Eight dichotomous questions were asked to study how often nurses prescribed medicines and in what manner. RNs' views on the consequences of nurse prescribing for nurses' practice were assessed using three items on a five-point Likert scale ranging from (1) "completely disagree" - (5) "completely agree". Differences in percentage frequency of prescribing and mean scores for opinion items were calculated between the 2006 and 2012 samples and tested for significance ( $P \leq 0.05$ ) using logistic regression, controlling for age and healthcare sector. Standard errors were corrected for clustering at the respondent level. Subgroup analyses were performed by grouping RNs according to their work setting/ healthcare sector. Data were analyzed using STATA version 12.1 (Statacorp, 2011).

Additionally, we performed subgroup analyses for the 148 RNs who participated in both surveys (2006 and 2012). Their results corresponded with the overall results found and are therefore not presented separately in this paper.

### **7.3.8. Validity and reliability**

The original survey questionnaire was developed based on the literature on nurse prescribing and the intended legislation. To enhance content validity, the questionnaire was reviewed by experts on nurse prescribing, and adjustments were made on the basis of their feedback [19,30].

## 7.4. Results

### 7.4.1. Demographics

Of the 500 questionnaires sent out in 2006, 386 were returned, yielding a response rate of 77.2% [19,30]. In 2012, the questionnaire was completed by 644 of the 943 panel members invited to take part, resulting in a slightly lower response rate of 68.3%. There is a 23% (n=148) overlap between the panel members surveyed in 2006 and those included in the 2012 survey. The gender breakdown of respondents is similar in the two years, with women outnumbering men in both surveys: 87.1% and 83.9% of respondents were female in the 2006 and 2012 surveys respectively. However, the respondents in the 2012 survey were on average somewhat older than the respondents in the 2006 survey, at 47.2 versus 42.4 years and had more work experience: 21.2 years versus 17.8 years respectively (Table 7.1). This is partly explained by the ageing of the Dutch nursing profession as a whole. Furthermore, in 2012 a larger proportion of respondents worked in hospitals and nursing homes/homes for the elderly, while fewer respondents worked in the care for disabled people and home care (Table 7.1).

Table 7.1 Demographic characteristics respondents 2006 and 2012

	2006	2012	Test F statistic	P value
Total <i>n</i> for analyses	386	644		
Respondents in both 2006 and 2012 surveys (% of total per survey)	148 (38.3%)	148 (23.0%)		
Female <sup>1</sup>	87.1%	83.9%		0.105 <sup>2</sup>
Mean (range) age in years <sup>1</sup>	42.4 (23.0–61.0)	47.2 (22.0–65.7)	74.81	<0.001 <sup>*3</sup>
Mean number of years' work experience <sup>1,4</sup>	17.8 (n=382)	21.2 (n=639)	37.77	<0.001 <sup>*3</sup>
Respondents working in hospital care	96 (24.9%)	261 (40.5%)		
Respondents working in mental health care	96 (24.9%)	130 (20.2%)		

Table 7.1 – To be continued -

	2006	2012	Test F statistic	P value
Respondents working in care for disabled people <sup>3</sup>	91 (23.5%)	90 (14.0%)		
Respondents working in home care	100 (25.9%)	118 (18.3%)		
Respondents working in nursing homes or homes for the elderly	3 (0.8%)	45 (7.0%)		
Respondents belonging to one of the first categories of specialized RNs to be granted prescribing rights (i.e. diabetes care nurses, lung nurses and oncology nurses)	<i>not asked</i>	19 (3.0%)		

<sup>1</sup> Standard errors are corrected for clustering at the respondent level.

<sup>2</sup> Significance levels derive from logistic regression analysis.

<sup>3</sup> Significance levels derive from linear regression analysis.

<sup>4</sup> Has missing values.

\*P < 0.001

### ***Feelings of being adequately equipped to prescribe medicines***

Only 12% of the nurses surveyed in 2012 felt adequately equipped to prescribe medicines, a percentage equal to what we found in 2006 (12.7%). When it came to the reasons for nurses' feelings of being inadequately equipped to prescribe, hardly any changes have occurred since 2006 (Table 7.2). In both years, more than three-quarters of all respondents said they had insufficient knowledge to prescribe medicines, making it the most important reason for nurses' feelings of inadequacy. Interestingly, of the RNs who said that their knowledge was insufficient, 6% had already followed the 'Pharmacotherapy' module, 3.5% planned to do so within a year, while 90.5% had no plans to follow the module at all. Moreover, 66.7% (n=26) of the RNs who had already followed the module still said they had insufficient knowledge to prescribe (percentages not shown). The number of RNs who said that the support from their organization is insufficient to prescribe medicines has increased since 2006. In 2012, more than 40% of the RNs felt a lack of support from their organization for nurse prescribing, whereas back in 2006 this was only 26% (P < 0.001).

In other matters, no changes can be observed since 2006. As in 2006, we found that the second most important reason for nurses to feel inadequately equipped to prescribe medicines in 2012 was that formal responsibilities were not properly defined (61.6%). Regarding the answers to the open response category 'other', most answers in 2006 and 2012 related to issues concerning professional task areas. Nurses stated, for example, that prescribing "does not belong to nurses' task area" and "should remain the sole domain of the doctor". Overall, we reject hypothesis 1, that RNs in 2012 feel better equipped to prescribe medicines than in 2006. Moreover, we conclude that hardly any changes have occurred in nurses' reasons for feelings of inadequacy in the intervening period. The only change observed was that RNs feel less supported by their organization in 2012 in prescribing medicines than in 2006.

Table 7.2 Reasons RNs do not feel adequately equipped to prescribe medicines<sup>1</sup>

	<i>n</i>	%	<i>P</i> value
My knowledge is insufficient			
2006	269	82.8	0.579
2012	431	77.0	
Formal responsibilities are not properly defined			0.886
2006	202	62.2	
2012	345	61.6	
The division of tasks between doctors and nurses is not properly defined			0.193
2006	136	41.9	
2012	213	38.0	
The support from my organization is insufficient			<0.001*
2006	85	26.2	
2012	225	40.2	
My skills are insufficient			0.302
2006	72	22.2	
2012	140	25.0	
I have too little time to do it			0.103
2006	33	10.2	
2012	74	13.2	
Other			0.456
2006	38	11.7	
2012	76	13.6	

<sup>1</sup> Significance levels derive from logistic regression analyses that controlled for age and healthcare sector.

Standard errors are corrected for clustering at the respondent level.

\*P < 0.001

Note: These questions were only answered by nurses who said that they did not feel adequately equipped to prescribe medicines.

### **Prescribing practices**

More than one quarter of all RNs in our surveys stated that nurses in their team sometimes write prescriptions (Table 7.3). This percentage is slightly lower in 2012 (27.6%) than in 2006 (29.2%,  $P = 0.007$ ). Subgroup analysis reveals that especially the number of RNs working in hospitals and home care who sometimes prescribe medicines has decreased since 2006. In 2012, hardly any RNs working in home care said that nurses in their team sometimes prescribe medicines (3.4%) and less than half of the RNs working in hospitals said this (43.3%). These numbers have declined by 11.6 percentage points and 20.9 percentage points respectively since 2006 ( $P = 0.002$ ). These results support hypothesis 2, which states that the number of RNs writing ‘illegal’ prescriptions in 2012 is smaller than in 2006.

If we look at the way nurses prescribe medicines, we find that overall, compared with 2006, fewer RNs said that prescribing takes place exclusively by order of the physician ( $P = 0.041$ ). By prescribing ‘by order of the physician’, we mean that a physician has determined which medicine a patient should receive and a nurse is asked, either written or verbal, to write the prescription. However, subgroup analysis shows that mental health care was the only sector where nurses prescribed medicines less often by order of the physician in 2012 (10.1%) compared with 2006 (20.2%;  $P = 0.021$ ). If nurses wrote medicines on their own initiative, these were usually for prescription-only medicines, either as repeat prescriptions (3.0%) or new prescriptions (9.0%) and less often for pharmacy and over-the-counter medicines (3.0%). There were no significant differences in this regard between 2006 and 2012.

Table 7.3 Nurses’ prescribing practices<sup>1</sup>

<b>Nurses in my team...</b>	<b>n</b>	<b>%</b>	<b>P value</b>
Sometimes prescribe medicines (apart from the question who signs the prescription)			
2006	112	29.2	<b>0.007*</b>
2012	177	27.6	
Prescribe exclusively by order of the physician			
2006	65	17.0	<b>0.041*</b>
2012	81	12.7	
Sometimes prescribe on their own initiative			
2006	46	12.0	<b>0.041*</b>
2012	93	14.6	

Table 7.3 - To be continued -

<b>Nurses in my team...</b>	<b>n</b>	<b>%</b>	<b>P value</b>
Sometimes prescribe on their own initiative, but only pharmacy and over-the-counter medicines			
2006	13	3.4	0.116
2012	19	3.0	
Sometimes prescribe prescription-only medicines on their own initiative, but only for repeat prescriptions			
2006	6	1.6	0.324
2012	19	3.0	
Sometimes prescribe on their own initiative			
2006	26	6.8	0.324
2012	58	9.0	

<sup>1</sup>Significance levels derive from logistic regression analyses that controlled for age and healthcare sector.

Standard errors are corrected for clustering at the respondent level.

\*P < 0.05

Note: n (%) = number of RNs who answered 'yes' to the question.

### ***Views on the consequences of nurse prescribing for nurses' practice***

The number of RNs who had experience with RNs in their team writing prescriptions and who believed that nurse prescribing increases nurses' workload decreased from 69.0% in 2006 to 53.8% in 2012 (P = 0.018). Despite this decrease, still more than half of RNs were concerned about work pressure issues in relation to nurse prescribing. Compared with 2006, more RNs agreed that nurse prescribing makes nurses' work more interesting and that it offers possibilities for nurses to educate and develop themselves, but these increases were not significant (Table 7.4).

We found partial support for hypothesis 3 that RNs hold more positive views on the consequences of nurse prescribing in 2012 compared with 2006. However, it should be noted that the percentages of RNs who hold positive views on the consequences of nurse prescribing for nurses' practice still lay in the region of 50-60%.

Table 7.4 Nurses' views on consequences of nurse prescribing for nurses' practice<sup>1</sup>

<i>Nurse prescribing...</i>	<i>% of RNs who (totally) agree</i>		
	<i>2006 (n=29)</i>	<i>2012 (n=93)</i>	<i>P value</i>
Increases nurses' workload	69.0%	53.8%	<b>0.018*</b>
Makes nurses' work more interesting	51.7%	62.4%	0.457
Offers possibilities for nurses to educate and develop themselves	41.4%	47.3%	0.527

<sup>1</sup>Significance levels derive from linear regression analyses that controlled for age and healthcare sector.

Standard errors are corrected for clustering at the respondent level.

\*P < 0.05

Note: This question was only answered by nurses who indicated that nurses within their team sometimes write prescriptions on their own initiative. Scores on the items varied from 1 (totally disagree) to 5 (totally agree).

## 7.5. Discussion

In general, we found fairly little change in Registered Nurses' views on prescribing and prescribing practices between 2006 and 2012. Based on the increased opportunities for nurse prescribing education and information meetings, we expected more RNs to feel adequately equipped to prescribe medicines, but this percentage remained constant (12.7% in 2006 and 12.0% in 2012). RNs' reasons for feeling thus were also stable, with insufficient knowledge and no proper definition of formal responsibilities being the two most important ones. Moreover, we found that of the RNs who had already followed the 'Pharmacotherapy' module, a large majority still felt they have insufficient knowledge to prescribe medicines. Unfortunately, our study does not provide information about why some of the RNs who followed the module still felt to have insufficient knowledge to prescribe. Prior research has indicated that nurses' pharmacology knowledge and scientific education are insufficient to prescribe [14,31]. It has also been suggested that attention needs to be given to nurses' assessment and diagnostic skills which underpin their prescribing role [18]. After all, should RNs' basic educational preparation turn out to be insufficient to prescribe, the Pharmacotherapy module will not be sufficient to start prescribing in practice.

Remarkably, the percentage of RNs who felt the support from their organization to be insufficient increased to 40% in 2012. As RNs are still not legally allowed to prescribe medicines, it is not surprising that four in 10

nurses still feel a lack of support from their organization, but the increase in comparison with 2006 is noteworthy. A possible explanation for this somewhat counterintuitive finding is that RNs, in anticipation of the forthcoming legislation, may have introduced the topic of nurse prescribing in their organizations and encountered a lack of enthusiasm and/or lack of the necessary preconditions for implementation that they were unaware of until then. This lack of organizational support, in terms of having structures and processes in place to enable nurse prescribing, is a frequently reported source of frustration and delay [10,32,33]. Moreover, it has been found to seriously hamper the implementation of nurse prescribing across various countries [34,35].

In line with our expectations, the number of RNs indicating that nurses in their team sometimes write prescriptions was smaller in 2012 than in 2006, especially in hospitals and home care. This can be explained by the stricter controls by the Dutch Health Care Inspectorate in the intervening period and the possible subsequent reaction of healthcare organizations to this. Moreover, with all the media attention to forthcoming legislation, RNs themselves were also reminded of the fact that their prescribing practices at that time lacked a legal basis and this may have influenced their decision to do so. However, where RNs stated that RNs in their team did sometimes write prescriptions, this was less likely to involve prescribing exclusively by order of the physician. It is possible that the small group of RNs who were already prescribing, were adjusting their prescribing practices in anticipation of the forthcoming legislation. Hence, there appear to be two different trends; one group of RNs has become more restrictive in view of the developments that took place between 2006 and 2012, while another group of RNs who continued to prescribe did so more often on their own initiative.

Finally, we expected RNs to hold more positive views on the consequences of nurse prescribing in 2012 compared with 2006, considering their increased knowledge about the final prescriptive authority they would be given and positive reviews from other countries that were highlighted by the Dutch Nurses' Association, for example. The only significant difference found, however, was a decrease in the number of RNs who believed that nurse prescribing increases nurses' workload, from 69.0% to a still relatively high 53.8%.

Hence, the prescribing views and practices of Dutch RNs changed little between 2006 and 2012, despite several internal and external forces that might have changed them. Our results suggest that external forces (developments

from outside the nursing profession) such as the increased checks on illegal prescribing practices [29] had most, but still limited, influence. Overall, RNs' support for nurse prescribing and their actual prescribing practices and/or intention to prescribe, remained subdued. The main explanation for this finding seems to lie in RNs' cautious attitude towards nurse prescribing. This is exemplified by the high percentage of RNs (90.5%) in our study that has no plans to take the 'Pharmacotherapy' module that is required to obtain prescriptive authority. However, this result should be viewed in the context of the current legislation. Prescriptive authority will initially only be assigned to three categories of RNs, namely; diabetes, lung and oncology nurses. Other categories of RNs may therefore feel little need as yet to take the module. Nonetheless, several professional associations of other categories of specialized RNs have already indicated to the Ministry of Health that they would like to apply for prescriptive authority as well, including prison nurses, dialysis and nephrology nurses, rheumatology nurses, community psychiatric nurses and HIV/AIDS nurses [36,37]. In view of this, the 90.5% of RNs who have no plans to take the 'Pharmacotherapy' module can still be considered quite high.

Our study showed that RNs' views and practices concerning nurse prescribing are fairly stable. Internal and external forces, including increased educational opportunities, have fairly limited influence on their views and practices. This suggests that prescribing touches on a fundamental issue in nursing, namely what constitutes nursing practice. Part of the nursing profession feels that nurse prescribing shifts the focus too much from care to cure and believes prescribing to be outside the parameters of nursing practice [10-13]. Our study contributes to existing knowledge by suggesting that this is a fairly steady position. If, as our results suggest, part of the nursing profession has a reserved attitude towards nurse prescribing and a considerable number of RNs experience a lack of support from their organization for nurse prescribing, expectations about the potential impact of nurse prescribing on health care may need to be adjusted. After all, introducing the legal possibility of nurse prescribing does not automatically lead to actual nurse prescribing in practice. If a substantial proportion of RNs do not use their authority to prescribe, positive effects may be lower than expected and/or hoped for. It has already been shown that the uptake of the nurse prescribing role can be variable [5]. However, internationally little is known yet about how many nurses actually make use of the ability to prescribe and if they do so, how often they prescribe in daily practice. As much policy is based on the

assumption of a positive uptake and active use of prescriptive authority, it is important to gain more insight into these matters.

#### **7.5.1. Limitations**

Several limitations of the study bear mentioning. Even though we had a fairly good overall response rate and sample size for analyses for the 2006 and 2012 surveys, the nature of our questionnaire meant that some analyses could be performed on only a small number of respondents, which led to a lack of statistical power and prevents us from drawing any definitive conclusions. Moreover, we were unable to perform subgroup analysis for the three groups of RNs who will initially be granted prescribing rights in the Netherlands (i.e. diabetes care, lung and oncology nurses) for two reasons: first, in 2006 there was no question about nursing specialization so we were unable to determine which nurses among the respondents fell into one of these categories and second, in 2012 their numbers were too small (n=19). However, some descriptive analyses show that only 4 of these 19 RNs felt adequately equipped to prescribe medicines. Moreover, even though they were encouraged by their professional associations to already take the 'Pharmacotherapy' module, only 7 of the 19 RNs had done so or had plans to do so, while 12 of the 19 RNs said they had no plans in this direction. Hence, these results appear to be in agreement with the overall results found. Finally, because we asked respondents to report on prescribing practices that were still illegal, we asked how often nurses in their team wrote prescriptions instead of how often they themselves wrote prescriptions. While this may have lowered the chances of obtaining socially desirable responses, it is also a less accurate way of measuring nurses' prescribing practices.

#### **7.6. Conclusion**

The findings of this study highlight the persistency of the international debate in the nursing profession about whether prescribing is something that nurses should be doing. If part of the nursing profession has a reserved attitude towards nurse prescribing, policy expectations about the potential impact of nurse prescribing on health care may need to be adjusted. In-depth qualitative research should further explore why some of the RNs in our sample who already followed the required prescribing training still felt to have insufficient knowledge to prescribe. To ensure that nurse prescribing constitutes a safe

and high quality practice, it is important that educational curricula fit RNs' needs. Finally, a study amongst nurses, physicians and managers at organizational level would be valuable in exploring barriers and facilitators to the implementation of nurse prescribing in everyday practice. Results of such a study could be used, for example by nursing and medical associations, to help organizations adapt to nurse prescribing.

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# 8

## **Neutral to positive views on the consequences of nurse prescribing: results of a national survey among registered nurses, nurse specialists and physicians**

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## **Abstract**

### **Background**

Over the last two decades, the number of countries where nurses are legally permitted to prescribe medication has grown considerably. A lack of peer support and/or objections by physicians can act as factors hampering nurse prescribing. Earlier research suggests that physicians are generally less supportive and more concerned about nurse prescribing than nurses are. However, direct comparisons between doctors' and nurses' views are scarce and are often based on small sample sizes.

### **Objectives**

To gain insight into the views of Dutch registered nurses (RNs), nurse specialists (with a master's in Advanced Nursing Practice) and physicians on the consequences of nurse prescribing.

### **Design**

Survey study.

### **Participants**

Survey questionnaires were sent to national samples of RNs, nurse specialists and physicians.

### **Methods**

The questionnaire addressed, among others, respondents' general views on the consequences of nurse prescribing for the quality of care, the nursing and medical professions, and the relationship between the medical and nursing professions.

### **Results**

The net response rate was 66.0% for RNs (n=617), 28.3% for nurse specialists (n=375) and 33.7% for physicians (n=265). It was found that all groups agreed that nurse prescribing benefits nurses' daily practice and the nursing profession. There were few concerns about negative consequences for physicians' practice and the medical profession. Nurse specialists gave significantly ( $P < 0.05$ ) more positive scores on most items than RNs and physicians. We found relatively little difference in views between RNs and physicians. It was only on issues surrounding the quality of care and patient

safety that doctors showed more concerns, albeit mild, than RNs and nurse specialists.

### **Conclusions**

RNs, nurse specialists and physicians generally hold neutral to moderately positive views on nurse prescribing. This is beneficial for the implementation and potential success of nurse prescribing in practice, as a lack of peer support and/or objections from physicians can be a hampering factor. However, concerns about the consequences of nurse prescribing for the quality of care and patient safety remain a point for attention, especially among physicians.

## 8.1. Introduction

### 8.1.1 Background

In the current climate of cost containment in health care, governments increasingly see the shifting of tasks from physicians to nurses as a suitable policy response. At the same time, the nursing profession is attempting to increase its professional status, using several strategies for occupational advancement [1]. These developments have resulted in nurses taking up new positions – such as the role of the clinical nurse specialist in the UK [2] and the nurse specialist in the Netherlands [3,4] – and new tasks, one of which is the prescription of medicines. Over the last two decades, the number of countries in which nurses are legally permitted to prescribe medication has grown considerably [5-9].

Internationally, much is expected of nurse prescribing and the related task substitution. In the UK, it has been claimed that many of the quality targets set by the Department of Health for the primary care setting will rely on nurses taking on new roles [10] and in the Netherlands, nurse prescribing is expected to contribute to efficient and effective patient care and to improve the quality and continuity of care [11,12]. One of the greatest obstacles to achieving these goals, however, and to task substitution and changes in skill mix in general, are the traditional roles occupied by health care professionals [13,14]. Because prescribing has traditionally been the sole domain of the medical profession [15-17], the expansion of prescriptive authority to include nurses touches on issues of professional boundaries.

Sociological research has shown that traditional roles and professional boundaries are highly important for professional groups, as these help define their professional identity and secure power [18,19]. So when professions take on new roles or when tasks are redistributed, professional boundaries are subject to renegotiation and professions compete with each other for jurisdiction over tasks [20]. This became visible in several countries around the time when nurse prescribing was introduced. Medical associations in Australia, Spain, Sweden and the USA, for example, strongly opposed the introduction of nurse prescribing [6,21-24]. Moreover, many incidents between nurses and doctors on the work floor involve professional boundaries [25]. [10] showed that the support of other healthcare professionals is crucial to the success of nurse prescribing, and a lack of peer support and/or objections by physicians or other health care staff can hamper nurse prescribing [2]. Given the important role played by prescribing and non-

prescribing nurses and physicians in supporting or impeding the development of nurse prescribing, it is important to consider their views on the subject so that potential obstacles can be addressed. A considerable amount of research has been conducted into the views and attitudes of nurses and physicians towards nurse prescribing. These studies showed positive views among nurses and physicians on nurse prescribing, for example with regard to improvements in the efficiency and coordination of patient care [2,26] and an increase in nurses' autonomy [27,28]. Less supportive attitudes, however, were also reported. A lack of support or even resistance from physicians to nurse prescribing was repeatedly mentioned [2,27,29], as were concerns about job roles [30] and nurses' lack of confidence in their own competency to prescribe or in the adequacy of the training they received [31-33].

The majority of these studies focused exclusively on either the views of prescribing and/or non-prescribing nurses [10,26,28,32-34] or the views of physicians [29,35], thus lacking a comparative design. Only a minority directly compared the views of physicians and nurses [27,30]. Yet doctors and nurses work closely together and share the task of prescribing medicines [2,13]. It is therefore particularly important to know whether their views are aligned or not, especially in the context of the ongoing implementation of nurse prescribing.

The few studies in which physicians' and nurses' views were compared included those by [27] and [30]. These authors showed that both professional groups were in favour of nurse prescribing, although medical professionals expressed more concerns than nurses. While both believed that nurse prescribing would increase nurses' autonomy, workload and responsibility, physicians were more likely to believe it would make services more complex and decrease their own autonomy. In our study, we have elaborated on these results by asking medical and nursing professionals about their views on nurse prescribing and its influence on everyday practice. Additionally, we are not only comparing physicians' and nurses' views, but also distinguishing between the views of registered nurses and nurse specialists, as prescriptive authority is regulated by two different articles of law for these two groups in the Netherlands. Dutch nurse specialists have had prescriptive authority since January 2012, whereas registered nurses' prescriptive authority is expected to come into force later this year (see Box 8.1). Hence, our study incorporates three distinct professional groups, and multiple professional boundaries and jurisdictional negotiations. In line with the above-mentioned studies, prior to

the study we expected nurse specialists and RNs to hold more positive views on nurse prescribing than doctors.

**Box 8.1 Nurse prescribing in the Netherlands as per March 2013**

Nurse prescribing in the Netherlands is regulated by two different articles of law, one for nurse specialists (with a master's in Advanced Nursing Practice) and one for registered nurses (who hold a bachelor's degree and in addition successfully completed a module 'Pharmacotherapy' at a University of Applied Sciences).

*Nurse specialists (Master of Advanced Nursing Practice) and prescriptive authority*  
Nurse specialists (with a master's in Advanced Nursing Practice) are allowed to prescribe any licensed medicine for any medical condition within their specialism and competence since January 2012. However, their prescriptive authority is part of the so-called experimental article (36A) in the Dutch Individual Health Care Professions Act ('Wet BIG'). This means that nurse specialists are allowed to perform reserved procedures, including the prescribing of medicines, for an experimental period of five years. Upon positive evaluation, a final arrangement might be included in the law which will grant nurse specialists final authority to perform reserved procedures, including prescribing. There are five nurse specialisms in the Netherlands, namely acute care, chronic care, intensive care, preventive care and mental health care [11,12].

*Categories of registered nurses (bachelor's degree) and prescriptive authority*  
Prescriptive authority for certain categories of registered nurses is regulated in article 36 of the Dutch Individual Health Care Professions Act, which states that prescriptive authority can only be granted to specific categories of registered nurses (bachelor's degree) that are designated by a Ministerial Order. The categories of RNs that were initially designated as being allowed to prescribe are diabetes care nurses, lung nurses and oncology nurses [38]. To be allowed to prescribe, these RNs must hold a bachelor's degree and they must have successfully completed a module 'Pharmacotherapy' at a University of Applied Sciences. It is expected that diabetes care- and lung nurses will start prescribing in the course of 2013 and oncology nurses by 1 January 2014 [39]. They will be allowed to prescribe a limited number of medicines within set protocols and standards, after a diagnosis has been made by a doctor [38,40,41]. In future, the Minister of Health can assign prescriptive authority to further categories of RNs by Ministerial Order.

An additional limitation of the studies conducted so far is that many have small sample sizes [2,26,30,31,35-37] and do not enable generalizations. Moreover, even though nurse prescribing has been introduced in ten Western countries [9], the majority of studies into the views and attitudes towards nurse prescribing were conducted in the UK, with only a few exceptions [32,35]. We therefore conducted a large scale survey study and studied the views of RNs, nurse specialists and physicians regarding the consequences of nurse prescribing for the quality of care, for their respective professions, and

for the relationship between the nursing and medical professions. After all, the introduction of nurse prescribing touches strongly on the issues of professional roles and boundaries, and the biggest concerns about nurse prescribing relate to issues of the quality of care [27,30].

### **8.1.2. Aims and research questions**

The aim of our study was to examine the views of registered nurses, nurse specialists and physicians in the Netherlands with regard to nurse prescribing. The following research questions were addressed:

What are the views of registered nurses, nurse specialists and physicians regarding:

- a. the consequences of nurse prescribing for the quality of care?
- b. the consequences of nurse prescribing for the nursing and medical professions?
- c. the consequences of nurse prescribing for the relationship between the medical and nursing professions?

## **8.2. Methods**

### **8.2.1. Sample**

To answer our research questions, we conducted a survey among three existing national samples: the Nursing Staff Panel [42], members of the Nurse Specialists department of the Dutch Nurses' Association ('*VE&VN Verpleegkundig Specialisten*') and members of the Royal Dutch Medical Association Panel ('*KNMG LedenPanel*').

The Nursing Staff Panel is a national sample that is representative of nursing staff in the largest health care sectors in the Netherlands, i.e. hospitals, psychiatry, care for disabled people, home care, nursing homes and homes for the elderly. Moreover, the age and gender distribution of the panel members corresponds to the age and gender distribution of the Dutch nursing staff population. Members for the Nursing Staff Panel are recruited via the Social Security Agency UWV. The UWV draws a representative sample of RNs from their policy administration and delivers the digital addresses to the Dutch research agency Panteia for their nursing survey. Participants to the Panteia survey can then indicate whether they are interested to participate in the Nursing Staff Panel as well. If they are interested, they are subsequently

invited for the next Nursing Staff Panel survey. However, RNs can also sign up for membership on their own initiative. Participation is entirely voluntary and anonymous. For this study, all Panel members who are RNs (n=943) were invited to participate in the survey. Dutch RNs are educated at two different levels and comprise nurses educated to associate degree level (3 - 3.5 years of professional training, equivalent to a UK foundation qualification) and nurses educated to Bachelor's degree level (at least 4 years of professional training). Both levels are represented in the panel. It should be noted that when our study was conducted, none of the participating RNs had legal authority to prescribe medicines yet.

For the sample of nurse specialists, all 1396 members of the Nurse Specialists department of the Dutch Nurses' Association were contacted and asked to participate in this survey. These members comprise 78.5% of all registered nurse specialists in the Netherlands (as at 15 September 2012; personal communication, *Verpleegkundig Specialisten Register*, 2012) and can be considered nationally representative. In this paper, they will be further referred to as the Nurse Specialists Panel. Participation was entirely voluntary and anonymous. When we conducted our study, all registered nurse specialists (with a master's in Advanced Nursing Practice) in the Netherlands were legally allowed to prescribe medicines.

For the sample of Dutch physicians, the Royal Dutch Medical Association Panel was used. Membership of this Panel is invitational. The Royal Dutch Medical Association makes a representative selection of physicians – taking into account the variables gender, age and specialism – and invites them to participate in the Panel. Participation is entirely voluntary and anonymous. The total Royal Dutch Medical Association Panel consists of about 4000 members and is representative for all 35,687 members (January 2012) of the Royal Dutch Medical Association (KNMG), who make up 48.6% of all physicians in the Netherlands. To keep the burden for members as low as possible, the total Panel is divided into several subpanels (all representative for gender, age and specialism). For this study, one of these representative subpanels, containing 915 members, was used.

### **8.2.2. Questionnaires**

The survey questionnaires were based on an existing instrument that was developed by De Veer *et al.* in 2006 to measure, among others, whether nurses felt adequately equipped to prescribe medicines and what their views were on the consequences of nurse prescribing for the quality of care, for the nursing

and medical professions, and for the relationship between the medical and nursing professions. The questionnaire was developed based on the literature on nurse prescribing. To enhance content validity, the original questionnaire was reviewed by experts on nurse prescribing, and adjustments were made on the basis of their feedback [43,44]. For the current study, the questionnaire was reviewed by experts of the Royal Dutch Medical Association and the Dutch Nurses' Association to check whether questions were (still) understandable for RNs, nurse specialists and physicians. No adjustments were made with respect to the original instrument. The questions were designed to be generic in order to cover both prescribing by categories of RNs (who will get limited prescriptive authority) and prescribing by nurse specialists (who can prescribe any medicine within their competence and scope of practice). In order to enable comparison between the three groups of health care professionals surveyed – RNs, nurse specialists and physicians – questions were posed in the same way and had the same answer categories in all three surveys.

The questions addressed, among others, the preconditions for nurse prescribing and respondents' general views on the consequences of nurse prescribing for the quality of care, for the nursing and medical professions and for the relationship between the medical and nursing professions. Because of the focus of this paper, only findings concerning the perceived consequences of nurse prescribing will be reported. Perceived consequences of nurse prescribing for the quality of care were measured with questions relating to complexity of care, quality improvements and patient safety. The perceived consequences of nurse prescribing for the medical and nursing professions were measured with questions about workload, professional autonomy, job diversity, professional status and professional practice. Finally, perceived consequences of nurse prescribing for the relationship between the medical and nursing profession were assessed with questions relating to interprofessional consultation, conflict and professional threat. The questions were predominantly multiple-choice although there were also some open questions. Statements were positively and negatively worded to avoid response set bias. To prevent confusion, any potentially unknown terms were explained briefly in the questionnaire. Copies of the final questionnaires are provided as supplementary material.

### **8.2.3. Ethical considerations**

The content of the questionnaire raised no substantial ethical issues. Study participation was voluntary and responses were anonymous and non-traceable to individual health care professionals, as was explained to participants in the cover letter that accompanied the questionnaire. Participant consent was assumed upon return of a completed questionnaire. In the Netherlands, the Medical Research Involving Human Subjects Act (Dutch: *WMO- Wet medisch-wetenschappelijk onderzoek met mensen*) regulates the protection of sick and healthy subjects in medical research. Any medical research that compromises the physical or psychological integrity of a person or persons is subject to the Act. A study that involves the completion of a questionnaire or questionnaires does not in principle fall within the scope of the Act, unless either the frequency with which a subject is asked to complete a questionnaire is sufficient to bring about a temporary change in the subject's lifestyle or the (psychologically probing) nature of the questions is such that the subject could be regarded as receiving a particular treatment or being asked to behave in a particular way [45]. According to the provisions of the Medical Research Involving Human Subjects Act (WMO), our study did not need to undergo a medical ethics review. Personal data were handled confidentially and processed anonymously as required by the rules of the Dutch Data Protection Act (Dutch: *Wbp- Wet bescherming persoonsgegevens*) and the applicable codes of conduct for scientific researchers.

### **8.2.4. Data collection**

First copies of the questionnaires, accompanied by a cover letter, were sent to panel members in September 2012. Members of the Nurse Specialists Panel and the Royal Dutch Medical Association Panel were contacted by email and asked to complete the questionnaire online. Non-respondents in these panels were sent up to two reminders at weekly intervals. From previous experience, it was known that the response rate from Nursing Staff Panel members to email questionnaires is generally low. Therefore, we used a mixed-mode survey approach for this panel. Members of the Nursing Staff Panel with a registered email address were initially contacted by e-mail, but those who failed to respond within one week and those without a registered e-mail address were subsequently sent a copy of the questionnaire, including a prepaid envelope for reply, by post. Afterwards, non-respondents received up to two reminders by post.

### **8.2.5. Data analysis**

Descriptive analyses were used to compare the background characteristics of the three groups of professionals, i.e. RNs, nurse specialists and physicians. Their general vision on nurse prescribing was assessed using fourteen items on a five-point Likert scale ranging from (1) “completely disagree” to (5) “completely agree”. These items were divided into three subscales: the consequences of nurse prescribing for the quality of care, the consequences for the nursing and medical professions and consequences for the relationship between the two professions. The mean scores on items were calculated for each group and differences between groups were tested for significance ( $p \leq 0.05$ ) using the one-way ANOVA test for heterogeneity and further analysed by Sidek post hoc analyses to compare between groups. The data was analysed using STATA version 12.1 [46].

## **8.3. Results**

### **8.3.1. Demographics**

#### *8.3.1.1. Nursing Staff Panel*

Of the 943 questionnaires that were sent out, 8 were sent to people who did not belong to the target group, i.e. people who had stopped working in health care ( $n=3$ ) and people who exclusively held management positions ( $n=5$ ). 677 questionnaires were returned, giving a gross response of 71.6%. Seven duplicate questionnaires were eliminated from further analysis. Respondents who indicated that they were a nurse as well as being either nurse practitioner, nurse specialist or nurse assistant were also excluded from further analyses ( $n=17$ ), as was one respondent who indicated that she did not feel capable of answering the questionnaire. Finally, respondents who did not answer our key question concerning their general vision on nurse prescribing were excluded from the analyses ( $n=27$ ).

In total, analyses were performed on 617 cases (net response: 66.0%). 84 per cent of the respondents were female, 16 per cent were male. Respondents were on average 47 years old and had 21 years' experience working as a nurse. Most respondents were employed in hospitals (41.2%), in mental health care (20.1%) and home care (18%) (Table 8.1).

Table 8.1 Demographic characteristics of the three panels

	<b>Nursing Staff Panel</b>	<b>Nurse Specialists Panel</b>	<b>Royal Dutch Medical Association Panel</b>
Total <i>n</i> for analyses	617	375	265
Female	83.9%	78.7%	46.0%
Male	16.1%	21.3%	54.0%
Average age in years	47.0	46.1	49.9
Average number of years work experience <sup>1</sup>	21.0 (n=613)	22.3 (n=375)	17.1 (n=250)

<sup>1</sup> Has missing values.

### 8.3.1.2. Nurse Specialists Panel

Of the 1396 questionnaires that were e-mailed, 69 were sent to people who did not belong to the target group, i.e. registered nurses (n=11), nurse practitioners who were not registered as 'nurse specialists' (n=13) and nurse specialists still in training and/or who had not completed registration (n=45). 582 questionnaires were returned, giving a gross response of 38.7%. Questionnaires were excluded from further analysis if they only provided demographic background information (n=44) or had missing answers on date of birth (n=42). Moreover, duplicate questionnaires were eliminated from further analysis (n=15). In addition, respondents who did not answer the question concerning their general vision on nurse prescribing were excluded from the analyses (n=37). In total, analyses were performed on 375 cases (net response: 28.3%). 79 per cent of the respondents were female, 21 per cent were male. Respondents were on average 46 years old and had 22 years' work experience as a nurse. The majority of nurse specialists worked in the specialist field of intensive care for somatic disorders (55.5%), almost one fifth worked within the field of mental health care (18.9%) and another fifth in chronic care for somatic disorders (17.3%). A minority worked as nurse specialists in acute care for somatic disorders (6.9%). Only a handful of nurse specialists worked in preventive care for somatic disorders (1.3%).

### 8.3.1.3. Royal Dutch Medical Association Panel

Of the 915 questionnaires that were sent out, 26 were sent to people who did not belong to the target group, i.e. people who were still in training (n=23), who were retired (n=2), who exclusively held advisory positions (n=1) and who indicated that they never work/cooperate with nurses in their daily practice (n=102). 393 questionnaires were returned, giving a gross response rate of 33.7%.

In total, analyses were performed on 265 cases (net response: 33.7%). 54 per cent of the respondents were male, 46 per cent were female. Respondents were on average 50 years old and had been registered for 17 years as a specialist or physician specialised in the area of preventive and social medicine. The majority of respondents were medical specialists (37.7%), general practitioners (31.3%) and geriatric specialists (13.6%). Respondents were employed in a variety of institutions. However, most of them worked in hospitals (34.7%), general practices (26.0%), and nursing homes (12.5%). All respondents worked with (specialized) RNs and/or nurse specialists in their daily practice.

### 8.3.2. Views on the consequences of nurse prescribing for the quality of care

Nurse specialists were generally more positive about the consequences of nurse prescribing on the quality of care than RNs and – particularly – physicians. Nevertheless, RNs and physicians still showed neutral or (moderately) positive views in their mean scores (see Table 8.2).

Nurse specialists were more convinced that nurse prescribing gives quality improvement than physicians and RNs were (Sidak post hoc;  $P < 0.001$ ), and they had fewer concerns about nurse prescribing endangering patient safety (Sidak post hoc;  $P < 0.001$ ). RNs, in turn, held more positive attitudes towards these issues than physicians (Sidak post hoc;  $P < 0.001$  and  $P < 0.045$  respectively). It was only when considering a possible increase in the complexity of care that physicians perceived (Sidak post hoc;  $P < 0.001$ ) fewer problems than RNs (the mean scores of physicians and nurse specialists did not differ on this item;  $P = 0.38$ ).

Table 8.2 Mean scores on items regarding the consequences of nurse prescribing on the quality of care, for each professional group<sup>1</sup>

Nurse prescribing...	Mean scores (SD)				
	Registered nurses (n=617)	Nurse specialists (n=375)	Physicians (n=265)	F ratio	F probability (p-value)
Makes care more complex	3.6 (0.9)	3.2 (1.1)	3.3 (1.0)	18.8	0.00
Gives quality improvements	3.1 (0.8)	3.9 (0.7)	2.8 (0.9)	198.2	0.00
Endangers patient safety	2.7 (0.9)	1.9 (0.7)	2.9 (1.1)	139.1	0.00

<sup>1</sup> One-way ANOVA results; scores on the items varied from 1 (completely disagree) to 5 (completely agree)

### **8.3.3. Views on the consequences of nurse prescribing for the nursing and medical professions**

Nurse specialists were more positive about the consequences that nurse prescribing has for the nursing and medical professions than physicians and RNs. However, even though nurse specialists were the most positive, physicians and RNs also held predominantly positive views towards nurse prescribing and its consequences for their respective professions (see Table 8.3).

Nurse specialists had more positive scores on all items than physicians and RNs (Sidak post hoc;  $P \leq 0.009$ ), except for the item 'increases nurses' workload' (where there was no significant difference with physicians' mean score). Especially when it comes to the item 'nurse prescribing increases nurses' autonomy', the difference in mean scores between nurse specialists ( $\mu$ : 4.2) on the one hand and physicians ( $\mu$ : 3.7) and RNs ( $\mu$ : 3.6) on the other is particularly high; more than half a point. The same applies to the item 'nurse prescribing makes nurses' professional practice more interesting', for which the differences between nurse specialists ( $\mu$ : 4.1), physicians ( $\mu$ : 3.8) and RNs ( $\mu$ : 3.6) are also considerable.

RNs and physicians were unanimously more reserved about the positive consequences of nurse prescribing for their professions than nurse specialists, even though they were still predominantly positive. Except for the significant differences between the items 'nurse prescribing increases nurses' workload' (physicians:  $3.4 \pm 0.8$  versus nurses  $3.7 \pm 0.9$ ) and 'nurse prescribing makes nurses' professional practice more interesting' (physicians:  $3.8 \pm 0.7$  versus nurses:  $3.6 \pm 0.8$ ), there were no significant differences between physicians and RNs when it came to their views on the consequences of nurse prescribing for the nursing and medical professions.

Table 8.3 Mean scores on items regarding the consequences of nurse prescribing for the medical and nursing professions, for each professional group<sup>1</sup>

Nurse prescribing...	Mean scores (SD)			F ratio	F probability (p-value)
	Registered nurses (n=617)	Nurse specialists (n=375)	Physicians (n=265)		
Increases nurses' autonomy	3.6 (0.9)	4.2 (0.7)	3.7 (0.9)	70.9	0.00
Increases nurses' workload	3.7 (0.9)	3.3 (1.0)	3.4 (0.8)	32.0	0.00
Increases nurses' responsibility	4.2 (0.6)	4.4 (0.6)	4.2 (0.6)	11.7	0.00
Decreases physicians' autonomy	2.8 (0.8)	2.3 (0.8)	2.7 (1.0)	33.2	0.00
Makes physicians' professional practice more interesting	2.8 (0.7)	3.0 (0.9)	2.8 (1.0)	11.6	0.00
Makes nurses' professional practice more interesting	3.6 (0.8)	4.1 (0.7)	3.8 (0.7)	66.3	0.00
Increases the diversity within nurses' jobs	3.8 (0.7)	4.1 (0.6)	3.9 (0.7)	32.6	0.00
Increases the professional status of the nurse	3.7 (0.8)	4.1 (0.8)	3.8 (0.8)	34.8	0.00

<sup>1</sup>One-way ANOVA results; scores on the items varied from 1 (completely disagree) to 5 (completely agree)

#### **8.3.4. Views on the consequences of nurse prescribing for the relationship between the medical and nursing professions**

When looking at the consequences of nurse prescribing for the relationship between the medical and nursing professions (Table 8.4), all three professional groups agreed that nurse prescribing increases the need for consultation between a physician and a nurse. When it came to nurse prescribing and its potential to create conflicts within care teams and its

potential to cause physicians to feel threatened, views were less explicit and centered around the score 'neither agree nor disagree'.

The mean scores between physicians and RNs did not differ significantly for any of the items studied. Nurse specialists, however, believed less often that nurse prescribing will lead to conflict within care teams (Sidak post hoc;  $P < 0.001$ ), but believed more often that nurse prescribing may cause physicians to feel threatened, in comparison with physicians and nurses (Sidak post hoc;  $P < 0.004$ ). Moreover, nurse specialists scored significantly higher on the item 'nurse prescribing increases the need for consultation between physician and nurse' than physicians ( $4.0 \pm 0.7$  and  $4.2 \pm 0.7$  respectively). There is no significant difference between nurse specialists and RNs on this item (Sidak post hoc;  $P = 0.056$ ).

Table 8.4 Mean scores on items regarding the consequences of nurse prescribing for the relationship between the medical and nursing profession, for each professional group<sup>1</sup>

Nurse prescribing...	Mean scores (SD)			F ratio	F probability (p-value)
	Registered nurses (n=617)	Nurse specialists (n=375)	Physicians (n=265)		
Increases the need for consultation between physician and nurse	4.1 (0.7)	4.0 (0.7)	4.2 (0.7)	5.5	0.00
Will lead to conflicts within care teams	2.9 (0.9)	2.4 (0.9)	2.8 (1.0)	36.6	0.00
May cause physicians to feel threatened	3.1 (0.9)	3.3 (1.0)	3.1 (1.1)	6.9	0.00

<sup>1</sup> One-way ANOVA results; scores on the items varied from 1 (completely disagree) to 5 (completely agree)

## 8.4. Discussion

In general, registered nurses, nurse specialists and physicians held neutral to moderately positive views on nurse prescribing. All groups agreed that nurse prescribing benefits nurses' daily practice and the nursing profession as a

whole. Moreover, there were few concerns about possible negative consequences for physicians' practice and the medical profession. Nonetheless, all professional groups agreed that nurse prescribing makes care slightly more complex, and they were also conscious of the fact that this increases the need for consultation between physicians and nurses. Most concerns were reported on the issues of quality of care and patient safety, especially among doctors. These were mostly mild concerns, however, as the general score for physicians on the item 'endangers patient safety' lay somewhere between 'disagree' and 'neither agree nor disagree'.

This study is the first to directly compare the views of registered nurses, nurse specialists and physicians on nurse prescribing using a large scale survey design. Considering that task substitution is increasingly seen as a strategy for reducing current problems in health care [47-49], and traditional roles are generally considered the most persistent problem to achieving these goals, it is promising that the views of RNs, nurse specialists and doctors in our study were generally neutral to positive about nurse prescribing. RNs, nurse specialists and doctors showed few concerns over the consequences of nurse prescribing for their respective professions and the relationship between both professions. Given that many incidents between nurses and physicians are in practice about the limits of their professional scope [25], these views are encouraging for the practice of nurse prescribing on the work floor, although it cannot automatically be assumed that views correspond with actual or future behaviour [18]. Both nurses and doctors felt that nurse prescribing increased the need for consultation between professionals, and this needs to be facilitated in practice. In the Netherlands, the Royal Dutch Medical Association and Dutch Nurses' Association jointly wrote the 'Guideline for implementing task reallocations' [50], which can play an important role in this.

Even though RNs, nurse specialists and physicians generally held neutral to moderately positive views on nurse prescribing, there were significant differences between the groups. Nurse specialists scored significantly more positively on 10 of the 14 items on the consequences of nurse prescribing compared to nurses and doctors. This is not surprising, as nurse specialists are known for their commitment to the professionalization of the nursing profession [51]. Having started as RNs themselves, they decided to follow the Master's in Advanced Nursing Practice to expand their role and task area. Considering this professional experience, the expansion of their role with yet another task, i.e. the prescribing of medicines, may be looked upon more

positive. Moreover, they already have prescriptive authority in the Netherlands. Contrary to our expectations, we found fairly little difference in views between RNs and physicians. Their scores only differed significantly on a mere 5 out of the 14 items, mostly when it came to issues concerning quality of care, on which RNs had more positive opinions than physicians. When it came to the consequences of nurse prescribing for the complexity of care and nurses' workload, however, physicians proved to be less concerned than RNs. The high degree of agreement between RNs and physicians concerning nurse prescribing is striking. After all, where tasks are redistributed, professional boundaries are disputed and professions usually compete with one another for jurisdiction over tasks [20]. Moreover, a lack of support or even resistance among physicians to nurse prescribing has frequently been found in earlier research [2,27,29,30]. In the Netherlands, medical associations initially also showed reservations or even reluctance towards the introduction of nurse prescribing [52]. Previously, representatives of the Royal Dutch Medical Association even stated that, although many physicians are neutral to positive about task substitution, there are also some fervent opponents [52]. One possible explanation for our findings can be sought in the fact that the Netherlands has a long tradition of prescribing by nurses. Even though nurse prescribing was officially prohibited until the beginning of 2012 for nurse specialists and up to now is prohibited for RNs, the fact that some individual nurses were already prescribing some medicines (Dutch: 'gedoogsituatie') was nevertheless openly discussed and tolerated. Therefore, the introduction of legal prescriptive authority for nurses may not have been such a large transition and the 'professional threat' caused by nurse prescribing may have seemed less for the medical profession here. This would be in line with findings from the UK, where it was shown that once health care professionals, including physicians, had experience with nurse prescribing, their views became more positive than when they lacked this hands-on experience [53]. Moreover, the Royal Dutch Medical Association and the Dutch Nurses' Association were both involved in the legislative process regarding nurse prescribing in the Netherlands [52]. Constant communication between the two associations and from each of them to their own members may have helped the acceptance of nurse prescribing. Besides, the introduction of nurse prescribing in the Netherlands has been a process that took many years, and health care professionals may gradually have become accustomed to the idea. Our study also showed that physicians still have some reservations, especially about issues surrounding quality of care and patient safety. This is in line with

earlier research, in which the medical profession expressed concerns about the safety of nurse prescribing [27,54]. As yet, however, little evidence is available about the quality and safety of nurse prescribing [55,56]. Even though developments are being made in this area (see for example the studies of [55] and [57]), these issues merit further investigation in order to address the concerns thoroughly.

The results of our study are promising for the implementation, expansion and acceptance of nurse prescribing in practice. While it has been repeatedly mentioned that traditional roles and professional turf battles can be barriers for task substitution, our study shows that in general, RNs, nurse specialists and physicians hold neutral to moderately positive views on nurse prescribing. To foster successful implementation of nurse prescribing in practice, and possibly alleviate some of the concerns expressed by physicians concerning quality of care and patient safety, it may be beneficial to apply a stepwise implementation of nurse prescribing. Especially considering the fact that our results are in line with Latter *et al.* (2011) in suggesting that the more experience people have with nurse prescribing, the more positive their views become. Hospitals could, for example, start with a nurse prescribing pilot. In this way, experience can be gained with nurse prescribing, and a workable mode can be found by all health care professionals involved, prior to the final introduction of nurses' prescriptive authority.

#### **8.4.1. Limitations**

Several limitations of the study bear mentioning. Although our study provides insights into the views of RNs, nurse specialists and doctors in the Netherlands on nurse prescribing, it should be noted that the response rates for nurse specialists (28.3%) and doctors (33.7%) were fairly low. Nurse specialists, because of the novelty of their role, are currently the subject of several studies in the Netherlands and this may have led to survey fatigue. Response rates for doctors in the Royal Dutch Medical Association Panel are generally relatively low, possibly because a large proportion of the panel members have been participating for years already. However, this may have resulted in non-response bias, mostly due to selective participation by respondents who are interested and/or more positive about the subjects of task substitution and nurse prescribing. Also, we asked for views on the broad category of 'nurse prescribing' and did not specify our questions for nurse specialists and RNs, who will have different sorts of prescriptive authority (see Box 8.1). Finally, it should be noted that our survey was performed at a time

when nurse specialists already had prescriptive authority and various categories of RNs (who are not nurse specialists) did not. This may have influenced respondents' answers, even though legal and organizational details of registered nurses' prescriptive authority were known by that time. Most importantly, it is likely that nurse specialists had more personal experience with prescribing in practice than RNs. Because it is known that views on nurse prescribing based upon experience may differ from views of those without hands-on experience with nurse prescribing [53], this may partly explain the more positive views found among nurse specialists in comparison with RNs. Nonetheless, it is unlikely that variances in amount of personal prescribing experience between nurse specialists and RNs fully account for the substantial differences in views that we found between the two groups.

## **8.5. Conclusion**

Our large-scale survey study among RNs, nurse specialists and physicians in the Netherlands showed that all three professional groups hold neutral to moderately positive views on nurse prescribing. Whereas nurse specialists are more positive about the consequences of nurse prescribing than RNs and physicians, we found fairly little difference in views between RNs and physicians. It was only on issues surrounding the quality of care and patient safety that physicians showed more – albeit mild – concern than RNs and nurse specialists. To address these concerns, further investigations into the quality and safety of nurse prescribing are required.

To a greater or lesser extent, all groups agreed that nurse prescribing benefits nurses' daily practice and the nursing profession. Moreover, there were few concerns about negative consequences for physicians' practice and the medical profession. This is beneficial for the implementation and potential success of nurse prescribing in practice, and for the relationships between the professions, given that it is known that a lack of peer support and/or objections from physicians can hamper nurse prescribing.

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# 9

## **Negotiating jurisdiction in the workplace: a multiple-case study of nurse prescribing in hospital settings**

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## **Abstract**

This paper reports on a multiple-case study of prescribing by nurse specialists in Dutch hospital settings. Most analyses of interprofessional negotiations over professional boundaries take a macro sociological approach and ignore workplace jurisdictions. Yet boundary blurring takes place and healthcare professionals renegotiate formal policies in the workplace. This paper studies the division of jurisdictional control over prescribing between nurse specialists and medical specialists in the workplace, and examines the relationship between workplace jurisdiction and legal jurisdiction over prescribing. Data collection took place in the Netherlands during the first half of 2013. The study used in-depth interviews with fifteen nurse specialists and fourteen medical specialists, non-participant observation of nurse specialists' prescribing consultations and document analysis. Great variety was found in the extent to which and way in which nurse specialists' legal prescriptive authority had been implemented. These findings suggest that there is considerable discrepancy between the division of jurisdictional control over prescribing at the macro (legal) level and the division at the micro (workplace) level.

## 9.1. Introduction

Governments increasingly see the shifting of tasks from physicians to nurses as a suitable policy response to current problems in healthcare, such as the shortage of physicians and rising costs [1-5]. At the same time, the nursing profession is attempting to increase its professional status, using several strategies for occupational advancement [6]. These joint developments have resulted in nurses taking up new positions – such as the role of clinical nurse specialist in the United Kingdom [7] and nurse specialist in the Netherlands [8,9] – and new tasks, one of which is the prescribing of medicines [10,11]. In the Netherlands, nurse specialists work autonomously and make independent diagnoses and treatment decisions (see Box 1). Since January 2012, they have been legally allowed to prescribe medicines and have shared legal jurisdiction over prescribing with physicians. While medical associations initially showed reservations or even reluctance towards the introduction of nurse prescribing [11], their resistance gradually decreased and they instead cooperated with nursing associations at the legal level whilst trying to influence the arrangement of nurse prescribing in such a way that the outcomes would be as beneficial as possible for themselves [12].

When nurses take up new positions or take over tasks from physicians, professional boundaries are shifted, and the division of jurisdictional control between the medical and nursing profession is changed. Up to now, little is known about how nurse prescribing takes shape in everyday healthcare practice. In this paper, we examine the division of jurisdictional control over prescribing between nurse specialists (with a Master's degree in Advanced Nursing Practice) and physicians in the workplace, and study the extent to which workplace jurisdiction over prescribing resembles legal jurisdiction over prescribing. In other words, we examine the extent to which nurse specialists' legal prescriptive authority resembles the way in which they are currently prescribing in everyday healthcare practice and what role medical specialists play in the prescribing process.

### Box 9.1 Nurse specialists in the Netherlands

Nurse specialists are registered nurses who have successfully completed a two-year Master's programme in Advanced Nursing Practice and have subsequently registered themselves in the Nurse Specialists Register (Verpleegkundig Specialisten Register in Dutch; [13]). There are five nurse specialisms in the Netherlands, namely acute care, chronic care, intensive care, preventive care and mental health care [14,15]. Nurse specialists work autonomously at the interface between medical and nursing care, and treat defined groups of patients with whom they establish an individual care relationship. Since January 2012, they have been allowed to prescribe any licensed medicine for any medical condition within their specialism and competence. However, their prescriptive authority is part of the so-called 'experimental article' (Article 36a) in the Dutch Individual Healthcare Professions Act (Wet BIG in Dutch). This means that nurse specialists are allowed to perform reserved procedures, including the prescribing of medicines, for a trial period of five years. If this experiment is evaluated as having been a success, a final arrangement may be included in the law, granting nurse specialists permanent authority to perform reserved procedures, including prescribing. Apart from the legal framework provided by the government, there has been limited official support for healthcare organisations and/or individual nurse specialists on how to translate nurse specialists' prescriptive authority in everyday work practices. One important guide that has been developed in this regard is the 'Guide to the implementation of task substitution' (Handreiking implementatie taakherschikking in Dutch), jointly written by the Royal Dutch Medical Association (KNMG), the Dutch Nurses' Association (V&VN) and the Netherlands Association of Physician Assistants (NAPA) [16].

### 9.2. Jurisdiction in the system of professions

Because prescribing has traditionally been the sole domain of the medical profession [17-19], the expansion of prescriptive authority to include nurse specialists touches on issues of professional domains and competition between professions for jurisdiction over tasks. Jurisdiction is crucial for professionals because it is their means of continued livelihood [20]. Professionals who are recognised as experts in a certain area, in this case the area of prescribing medicines, typically possess a form of cultural capital whose ownership confers status and power [21,22]. Therefore Abbott [23] labels jurisdiction – “the link between a profession and its work” – as the central phenomenon of professional life. Jurisdiction, in this sense, can be understood as professional control over the work itself and the knowledge mobilised within the occupation.

Since one profession can pre-empt another's jurisdiction or control over a task, professions exist in an interdependent system with competing jurisdictional claims. According to Abbott [23], professions can claim jurisdictional control over tasks in several arenas, namely the legal arena, the workplace arena and the arena of public opinion. The particular arena in which jurisdictional negotiations take place shapes the form that they assume [24,25]. In this paper, our focus will be on the workplace arena and the legal arena, and the relationship between these two.

Professional competition regarding jurisdiction over a task can have various outcomes. After all, not every profession striving for full jurisdiction will obtain it. Most professional conflicts over jurisdiction result in what are termed "limited jurisdictional settlements" [23]. These are alternatives to the situation in which one or more professions hold full jurisdiction over a task. In a jurisdictional settlement, professions share the jurisdiction over a task, whereby control is distributed between the professions to a greater or lesser extent equally, depending on the type of jurisdictional settlement concerned. Abbott [23] discerns several types of jurisdictional settlement, including subordination, whereby an incumbent profession controls the division of labour for one or more subordinate groups, intellectual jurisdiction, in which the incumbent profession controls the cognitive knowledge of an area but allows practice by other professions and client differentiation, in which different segments of a profession serve different client groups.

In the Netherlands, nurse specialists' legal prescriptive authority is comparable to that of physicians. Both physicians and nurse specialists are allowed to independently prescribe any licensed medicine for any medical condition within their specialism and competence (see Box 9.1). However, it should be noted that physicians have a significantly wider field of competence. Nonetheless, in the legal arena, nurse specialists and physicians share full jurisdiction over prescribing. In general, however, formalised jurisdictions have a rather vague relation to professional workplace realities [23]. In the workplace, professional boundaries cannot be strictly maintained and healthcare professionals renegotiate formal policies [26,27]. Allen [28] for example showed how boundary blurring took place between doctors and nurses on a surgical and medical ward in a general hospital, and Snelgrove and Hughes [29] likewise demonstrated the role blurring and informal crossing of boundaries that takes place between doctors and nurses. Hence, features of the work setting mediate the formal division of labour [24]. Yet investigations of workplace occupational boundaries are rare. Most analyses of

inter-occupational competition take a macrosociological approach, looking at the level of the professional field rather than the organisational level where interactions between professionals take place on a daily basis [20]. This is problematic, as organizations and individuals can mediate the influence of legislation on professional work jurisdictions and roles, and influence the extent to which shifts in professional boundaries take place in practice, for example by not formally recognising new sets of knowledge and skills in definitions of work roles and expertise, through training or in regulations [30]. Some of the rare studies that have looked into the issue of enacted professional jurisdictions (e.g. [31-34]) draw attention to the fact that purposive yet subtle actions of individuals and organisations, such as day-to-day adjustments, adaptations and compromises, can substantially change the division of jurisdiction on the work floor. The present study contributes to the literature by explicitly examining the link between the macro- and micro level by taking into consideration the legal arena and the workplace arena, and the relationship between these two.

This study has a twofold aim: first, to investigate the division of jurisdictional control over prescribing between Dutch nurse specialists (with a Master's degree in Advanced Nursing Practice) and physicians in the workplace; second, to study the extent to which workplace jurisdiction over prescribing resembles legal jurisdiction over prescribing. The following research questions were addressed:

1. How does prescribing by nurse specialists take shape in the workplace?
2. How is jurisdictional control over prescribing divided between nurse specialists and physicians in the workplace?
3. To what extent does workplace jurisdiction over prescribing resemble legal jurisdiction over prescribing?

### **9.3. The study**

#### **9.3.1. Research approach**

As prescribing processes are complex and context dependent, a multiple-case study research strategy was adopted [35]. Cases were defined as nurse specialists working in hospital settings and prescribing medicines to patients. Data on nurse specialists' prescribing practices were collected using a multi-method approach consisting of semi-structured interviews with nurse specialists and medical specialists, observations of nurse specialists'

prescribing consultations and document analysis. In line with earlier studies on enacted professional jurisdictions [31-34], we chose to employ a variety of research methods to allow for data triangulation. In doing so, we sought to increase confidence in the validity of our findings by integrating and synthesizing different sources of evidence [33,35]. This enabled us, for example, to 'validate' accounts of behaviour from interview data. After all, interview accounts cannot always be read as straightforward descriptions of practices [36].

### ***9.3.2. The sample of nurse specialists and physicians***

In this study, we aimed to select nurse specialists representing a range of work settings (university hospital versus general hospital), clinical contexts and nurse specialties. We therefore used purposive sampling. The aim of purposive sampling is to select participants who will generate appropriate data [35,37]. We conveniently selected three university hospitals and two general hospitals in the Netherlands. Within the hospitals, we purposively selected three nurse specialists working in different specialisms. However, some of the selected nurse specialists said they were not yet prescribing medicines, for example because they had not yet obtained permission from the hospital board of directors, and we therefore had to include other nurse specialists. It should be noted that permission from the board of directors is not legally required for nurse specialists to prescribe, but most hospitals nevertheless apply this rule. As the number of prescribing nurse specialists turned out to be fairly low in some hospitals, we eventually had to select some nurse specialists working in the same specialism and/or on the same ward.

All fifteen selected nurse specialists received an introductory letter about the study by email and were asked whether they would be interested in participating. If they said yes, a first appointment with one of the researchers was scheduled during which more information about the study was provided and all remaining questions that the nurse specialist might have were answered. All the invited nurse specialists agreed to participate and the final study sample consisted of fifteen nurse specialists. Because we aimed to include those medical specialists with whom the nurse specialists collaborated most often in their daily practice, the decision as to which medical specialist would be best suited to participate in the study was left up to the nurse specialists. Fourteen of the fifteen medical specialists who were nominated by the nurse specialists to participate in our study agreed to be interviewed.

Table 9.1 shows the different specialisms in which the participating nurse specialists and medical specialists were working.

Table 9.1 Specialisms of participating nurse specialists and medical specialists

<b>Specialism</b>	<b>Nurse specialists</b>	<b>Medical specialists</b>
Breast cancer care	2	-
Diabetes care	1	1
Haematology	3	3
Lung diseases	1	1
Nephrology	3	3
Neonatology	1	1
Oncology/palliative care	2	3
Thoracic surgery	1	1
Wound care	1	-
Vascular surgery	-	1
<i>Total</i>	<i>15</i>	<i>14</i>

### **9.3.3. Data collection**

Data collection took place during the first half of 2013, more than a year after nurse specialists in the Netherlands had obtained legal prescriptive authority. To study how prescribing by nurse specialists is taking shape in the workplace and how jurisdictional control over prescribing is divided between nurse specialists and physicians, we performed non-participant observations of nurse specialists' consultations, conducted semi-structured interviews with nurse specialists and medical specialists, and performed document analysis. On the basis of these analyses, we subsequently studied the extent to which nurse specialists' workplace jurisdiction over prescribing resembles their legal jurisdiction over prescribing. As we did not aim to compare nurse specialist and physician prescribing, physicians' prescribing consultations were not part of our data collection.

### **9.3.4. Semi-structured interviews with nurse specialists and physicians**

Interviews provided the primary source of data. The interviews with nurse specialists and medical specialists were semi-structured and were guided by topic lists that were compiled on the basis of the literature and previous studies by the research group [10,38,39]. The interview topics were formulated after examining the relevant literature and preliminary observations of nurse

specialist prescribing (see Box 2). The majority of interviews were conducted face to face by a member of the research team who was trained in qualitative interviewing techniques. However, for various reasons, three interviews with medical specialists were conducted by phone. All interviews were audiotaped and transcribed verbatim, and a copy of the transcript was sent to participants for alterations, additional comments and approval. The approved interview transcripts formed the basis for analysis and were imported into the data analysis software package MAXQDA 2007 for thematic analysis [40].

Box 9.2 Topic guide for interviews with nurse specialists and medical specialists

- Personal views on nurse specialists' prescriptive authority
- Prescribing training
- Prescribing experiences
- Considerations whilst prescribing
- Cooperation and relationship with medical specialist/nurse specialist and other healthcare professionals where prescribing is concerned
- Organisational conditions
- Future expectations regarding prescribing

**9.3.5. Non-participant observation of nurse specialists' consultations**

Non-participant observation of nurse specialists' prescribing consultations provided information that was used to supplement data collected through interviews. The consultations took place in both outpatient and inpatient hospital settings. We aimed to observe at least three consultations with each nurse specialist in which a prescription was issued by the nurse specialist. We reached this target with twelve of the fifteen nurse specialists. Because we observed more than the minimum of three prescribing consultations with five nurse specialists, our total number of observed prescribing consultations is 49. The number of consultations needed to collect three prescribing consultations varied from three to nineteen consultations among the twelve nurse specialists.

Data on nurse specialists' prescribing practices were collected by a member of the research team using a structured observation checklist. Moreover, for each prescribing consultation, details of the prescription (including dose and directions, patient age, gender, presenting condition, diagnosis, comorbidity and other medications taken) were recorded and/or extracted from patient records.

### **9.3.6. Document analysis**

Additionally, we collected all documents that were used by nurse specialists in the prescribing process. These included individual prescribing agreements with hospital pharmacies, ward-based formularies and references to online directories, such as the Pharmacotherapeutic Compass (*Farmacotherapeutisch Kompas* in Dutch).

### **9.3.7. Ethical considerations**

Our study design was sent to the Medical Ethical Committee of the VU University Medical Center and judged as not being subject to the Medical Research Involving Human Subjects Act. Therefore, no formal medical ethics review was required. The study design was reviewed and approved by some of the local institutional review boards of the participating hospitals. Personal data were handled confidentially and processed anonymously, as required by the rules of the Dutch Data Protection Act (*Wet bescherming persoonsgegevens* in Dutch) and the applicable codes of conduct for scientific researchers.

The study aims, data collection methods, procedures and the confidential, voluntary and anonymous nature of the study were explained to all participating nurse specialists and physicians by a member of the research team. Prior to the non-participant observation of consultations, details of the study and its voluntary nature were briefly explained to patients by a member of the research team and by an introductory letter. All patients gave their informed - written - consent to their participation in the study.

## **9.4. Data analysis**

We performed a thematic analysis of the interview transcripts, observation reports and documents gathered through the document analysis to answer our research questions [35]. Data analysis began at an early stage in the research in order to be able to introduce any necessary changes in the topic lists for the interviews and checklist for the observations. Data were analysed both inductively and deductively. We searched the data for concepts that were directly linked to jurisdictional control, interprofessional collaboration, interprofessional tensions, and nurse specialists' prescribing practices and considerations. Additionally, data were analysed inductively and compared for common statements and claims. To ensure the reliability and validity of

coding, two researchers (Authors) coded each interview transcript and observation report independently and verified each other's work. Discrepancies in coding were discussed until agreement was reached that the data in the transcripts were accurately represented by the revised themes. Recurring themes were identified and classified, and text fragments were sorted according to the thematic framework.

## **9.5. Findings**

Findings are organised around the main themes found through data analysis, i.e.: nurse specialists' prescribing practices, protocols, formularies and guidelines used whilst prescribing, cooperation between nurse specialists and medical specialists when prescribing medicines, and difficulties surrounding nurse specialists' prescriptive authority. Quotations were chosen to illustrate the themes.

### ***9.5.1. Nurse specialists' prescribing practices***

We found great variety in nurse specialists' prescribing practices, both in terms of the degree of prescribing and in terms of the types of prescriptions. The extent to which nurse specialists made use of their prescriptive authority in everyday practice varied considerably. Some nurse specialists said they prescribed "lots of prescriptions", for up to sixteen patients a day, while others estimated they wrote out a prescription three to ten times a week on average, and a small group stated they prescribed medication only once a week. These mixed results are in accordance with our observations, for example the number of consultations needed to obtain three prescribing consultations varied among the nurse specialists from three to nineteen consultations. Moreover, for one nurse specialist we were able to observe 28 prescribed medicines, while for others we were unable to reach our target of three prescribing consultations.

The same variety could be observed with regard to the type of prescription and the range of medicines that nurse specialists were allowed to prescribe in their work setting and the extent to which this was delimited at the hospital, ward or individual level. While most nurse specialists were allowed to independently prescribe both initial and repeat prescriptions, some were required to check their initial prescriptions with their medical specialist, except for medication that both considered as having a relatively low risk.

Moreover, in one of the observed cases, the nurse specialist was not allowed to sign initial prescriptions; the medical specialist signed a prescription that was filled in by the nurse specialist.

Most nurse specialists were allowed to prescribe a defined, often relatively limited, number of medicines as set out in protocols or (personal) formularies. However, some nurse specialists had considerably more freedom and could prescribe a broader range of medicines than others, depending on the protocols and formularies that were used in their workplace. In general, nurse specialists and medical specialists were satisfied with the range of medicines that could be prescribed by nurse specialists. Some physicians referred to these medicines as “common-or-garden medicines”, while others noted that the range of medicines should not be too restricted as patients do not fit into neat compartments and this would create an unworkable situation.

#### **9.5.2. Protocols, guidelines and formularies used whilst prescribing**

The number of different protocols, guidelines and formularies that were used by nurse specialists' whilst prescribing was extensive. Moreover, the level of applicability of these documents differed hugely, ranging from guidelines drafted by international professional associations to individual formularies developed by the individual nurse specialist. Most nurse specialists used various different protocols, guidelines and formularies in their everyday practice. In general, most nurse specialists appeared to prescribe on the basis of either local hospital protocols or ward-based protocols, used by all prescribers in the hospital or ward, or on the basis of local protocols specifically designed for nurse specialists:

*“Actually, most medication has already been described in an allogeneic transplant protocol; what is appropriate to start with in certain cases, what I said about the preventive medication, that’s all been captured in a protocol.”*  
(Nurse specialist 2)

*“Yes, those [protocols for nurse specialists] are tailor-made. With a proposal by the nurse specialists themselves, which medicines they encounter and where they feel competent and skilled. And that has been approved in the department meeting.”* (Medical specialist 8)

As indicated by the above quote, where nurse specialists prescribed on the basis of protocols that were specifically designed for them, these protocols

were almost always developed and/or approved by medical staff, and in most cases also by the hospital pharmacist.

In some hospitals, there were also formal arrangements about the kind of medicines for which nurse specialists were required to consult a medical specialist before prescribing them. Most of the time these included antibiotics and medicines with a relatively high risk, such as immunosuppressives.

### **9.5.3. Cooperation between nurse specialists and medical specialists when prescribing medicines**

There was considerable consultation between nurse specialists and physicians when nurse specialists prescribed, or considered prescribing, medicines. If nurse specialists had the slightest doubt about whether to prescribe, what to prescribe or which dose to prescribe, they contacted the medical specialist:

*“If I feel just a little bit unsure, I just get a doctor here.”* (Nurse specialist 12)

*“If something is being prescribed, there is always consultation with me, like: ‘This patient has this and that, and now I see this and I wanted to prescribe that. What do you think?’”* (Medical specialist 3)

Some nurse specialists also said that consultation with a physician always takes place in the case of the prescription of new medicines or deviations from standard protocols. This was reflected in our observations, in which, for example, one nurse specialist asked the collaborating medical specialist for advice about which type of antibiotic to prescribe, and another nurse specialists postponed the prescription of a non-standard medicine until she had discussed it with the medical specialist. Moreover, some nurse specialists were not allowed to treat medically complex patients; these patients were treated solely by the medical specialist.

The consultations between nurse specialists and medical specialists about prescribing decisions were almost exclusively informal in nature. Nurse specialists either walked round to the medical specialist and discussed the matter with them on the spot before returning to their patient, or they asked medical specialists to drop by during their patient consultation. Nurse specialists also phoned and emailed physicians for advice and additional checks on their prescriptions:

*“I pop round to someone or I call someone. And we’re not going to make an appointment for that first, that doesn’t work.”* (Nurse specialist 1)

The high frequency and informal nature of prescribing consultations between nurse specialists and physicians was confirmed by our observations. In more than a quarter of the prescribing consultations that we observed, nurse specialists contacted their medical specialist to discuss a possible prescription. These consultations were always informal in nature and included dropping in on the physician for advice, asking the physician to come in during a patient consultation, and jointly visiting the nurse specialist’s patient and discussing medication issues at the patient’s bedside.

The large majority of nurse specialists and medical specialists said they liked working in this way. Almost all participants experienced an increase in efficiency in their everyday practice. Before nurse specialists obtained prescriptive authority, all medicines were prescribed by medical specialists. Even though nurse specialists often already did the preparatory work and filled in the prescription, it still needed to be signed by a medical specialist, causing unnecessary delays for both healthcare professionals and patients. One medical specialist noted that “it makes your organisation more flexible” (Medical specialist 4) and a nurse specialist explained:

*“It is easier for me, because now you can finish everything with the patient and you don’t have to wait in the corridor for a quarter of an hour until the doctor has signed the prescription.”* (Nurse specialist 4)

However, while in general the prescribing process may have become more efficient, our observations showed that in cases where the nurse specialist consulted with the medical specialist before prescribing, i.e. in more than a quarter of the prescribing consultations, there was still considerable waiting time involved on the part of the nurse specialist and patient.

In most nurse specialist-physician partnerships, there was room for mutual constructive criticism and nurse specialists felt they had an equal relationship with physicians. As one nurse specialist expressed it:

*“And nowadays, I must say, it actually takes place on a very equal footing. We can discuss things with each other, we can talk about things. And ultimately the surgeon is the boss, that’s clear. But by now we have enough credibility so that, when I have good arguments, they listen to me.”* (Nurse specialist 13)

It appears that the foundation for the generally good cooperation between nurse specialists and medical specialists as regards prescribing lies in the mutual trust that has been built up between them over the years. Often, the nurse specialists and medical specialists had been cooperating for years already and knew each other quite well before nurse specialists' prescriptive authority was introduced. This made the change easier. Moreover, many of the medical specialists played a role in the nurse specialists' training, so they were well aware of how much training the nurse specialist had received and of what quality.

*"(...) that they know us, that makes a difference as well. We have been working together in a team for so long that they know your capabilities and you know your limits. And that we won't prescribe medicines for which we are not authorised."* (Nurse specialist 7)

#### **9.5.4. Difficulties surrounding nurse specialists' prescriptive authority**

Even though almost all medical specialists said they had confidence in nurse specialists' prescribing practices and were satisfied with it, and although nurse specialists are legally responsible for their acts, including prescribing, medical specialists still felt that they had 'final responsibility' for both the nurse specialist and the patient. Some of them said they had difficulties with letting go of this responsibility, partly because they felt they might lose sight of their patients somewhat. Partly as a result of this, some nurse specialists and medical specialists still worked in a fairly strict supervision relationship. Medical specialists in particular emphasised the importance of this:

*"My role is supervisory and actually the source of information for her, whereby, as time goes on, the information function will become more important than the monitoring task."* (Medical specialist 10)

*"Also a little educational, supervising. You are and always will be working in some kind of training situation."* (Medical specialist 3)

A minority of the medical specialists questioned the added value of nurse specialists' prescriptive authority and a few reported negative experiences with prescribing by nurse specialists. Some medical specialists were sorry that task substitution in general made their professional practice more 'businesslike', while others doubted its meaningfulness:

*“(..) I have my doubts. Not about whether our nurse specialists are good or whatever, but I have never seen the added value being expressed in numbers and compared to the situation before.” (Medical specialist 11)*

A few medical specialists were downright negative about some aspects of nurse specialists’ prescribing practices. This was mostly due to negative experiences with prescribing by nurse specialists.

*“For example, sometimes medicines are prescribed where I think: it would have been better if you had not done that yet, or you could have waited with that a bit longer.” (Medical specialist 6)*

Overall, few of the nurse specialists in our sample said they had personally had negative experiences with doctors who felt that their position was threatened by nurse specialists’ prescriptive authority and none of the medical specialists in our sample said they saw it as a threat to their position. However, many of our respondents, whether nurse specialists or medical specialists, knew doctors who were negative about nurse specialists’ prescriptive authority. Although this occurred amongst all age groups, it was repeatedly mentioned that younger medical specialists and medical specialist registrars or residents (doctors who are receiving advanced training in a specialist field of medicine) in particular felt threatened by nurse specialists:

*“Let me put it differently, I think that the young generation of specialists who are coming up will think: ‘those are chairs that we would have liked to sit on.’” (Medical specialist 11)*

#### **9.5.5. Institutionalisation of nurse specialists’ prescriptive authority**

On most hospital wards, nurse specialists’ prescriptive authority had not yet been fully institutionalised. Most nurse specialists were still waiting for one or two minor organisational issues to be dealt with in order to complete their prescriptive authority, for example obtaining personal prescription paper.

*“That approval of the list of medicines. I’m thinking: ‘well, that’s peanuts’. But it needs to be properly approved by all four medical specialists, and it has already taken me quite some time to get that done.” (Nurse specialist 11)*

Despite the fact that these organisational issues had not yet been fully dealt with, nurse specialists were already prescribing as if the issues had been tackled.

An important organisational aspect is nurse specialists' possession of their own individual General Data Management-code (*Algemeen GegevensBeheer-code* or *AGB-code* in Dutch). This code can be assigned to individual healthcare professionals, practices and institutions. The code is listed on medical bills and is used within the cost claims process in which the healthcare provider informs the health insurer of the care provided, so that the insurer can apply the appropriate rate when reimbursing healthcare expenditure. Only one nurse specialist already possessed her own AGB-code, some nurse specialists had requested an individual AGB-code, but the majority had not yet done so. Moreover, there was a remarkable degree of confusion about the AGB-code and its function in healthcare practice, both among nurse specialists and among medical specialists:

*"I have heard that we can request such a code as nurse specialists, but I also heard that it is not necessary or worthwhile because the hospital already has some sort of code. It is unclear to me."* (Nurse specialist 3)

Another problematic issue that was repeatedly brought up by respondents was related to the so-called Diagnosis Treatment Combinations (*Diagnose Behandel Combinaties* or *DBC's* in Dutch; the Dutch version of Diagnosis Related Groups). A DBC defines all the activities that are performed for the patient's diagnosis and treatment and the associated costs, and is used as a standardised classification of the care provided in the cost claims procedure. Since only medical specialists are allowed to open a DBC for a patient, their rates are used in cost claims, even though the actual patient care may have been provided by nurse specialists.

## **9.7. Discussion**

### ***9.7.1. Prescribing by nurse specialists in the workplace***

Across hospitals and hospital wards, we found a great variety in both the extent to which and way in which nurse specialists' legal prescriptive authority had been implemented. This already became apparent during our inclusion process, as it turned out that nurse specialists in some hospitals

were not yet prescribing medicines, even though they had the legal authority to do so. Among our final sample of prescribing nurse specialists, there was considerable variety in the number and range of medicines prescribed. Moreover, whilst prescribing, nurse specialists used a wide variety of supporting documents with different levels of applicability, ranging from guidelines drafted by international professional associations to personal formularies developed by the individual nurse specialist. Yet the manner in which the prescribing process took place was fairly similar for all prescribing nurse specialists; they were very much aware of their limitations when it came to prescribing and regularly consulted medical specialists about their prescribing decisions, almost always in an informal way. Both nurse specialists and medical specialists reported that they liked working in this way.

It may seem somewhat surprising that on the work floor, nurse specialists and medical specialists generally cooperate in a harmonious way. Especially considering the struggles that took place at macro level between medical associations and nursing associations regarding jurisdiction over prescribing in the Netherlands, and as is usually the case internationally [10,41-46]. In the sociology of professions, including Abbott's framework (1988), the emphasis is often on active and overt opposition from professions to defend their professional jurisdiction, as was can be found at macro level for nurse prescribing. However, our results show that professional opposition does not always have to be overt, at least not at micro level. Professions can take a cooperative stance and whilst doing so make sure that legal rules are being negotiated and framed in such a way that they retain the (amount of) professional jurisdiction they want. A second thing that should be taken into account is that once physicians have experience with nurse prescribing, their views become more positive than when they lack this hands-on experience [47]. This can also explain the discrepancy between the quite fierce negotiations taking place at macro level and the more harmonious negotiations taking place at on the work floor.

### ***9.7.2. Division of jurisdictional control over prescribing between nurse specialists and physicians in the workplace***

From a macro point of view, the division with regard to prescribing is unambiguous. We already noted that in the legal arena, nurse specialists and physicians share highly comparable full jurisdiction over prescribing. Yet due to the great variety in the manner in which this legal framework is currently being implemented and drawn up in the workplace, at the micro level a

variety of jurisdictional settlements coexists concerning nurse specialist prescribing. We found that nurse specialists hardly ever independently prescribe all medicines within their specialism and competence, as their legal authority allows them to do. Most of the time, medical specialists, consciously or unconsciously, still play a large role in nurse specialists' prescribing processes, thereby maintaining a situation of jurisdictional nursing subordination. Sometimes medical specialists drafted strict prescribing protocols for nurse specialists, so that the intellectual jurisdiction over prescribing remained with the medical profession [23]. So even though nurse specialists were allowed to prescribe, medical specialists retained control over the cognitive content of nurse specialists' prescribing practices. This is in line with findings by Currie et al. (2012) who showed that clinical genetics defined the limits of new policy-driven nurse roles by utilizing stipulated guidelines. We also found that nurse specialists were allowed to prescribe for 'routine patients', while the more complex patients were exclusively treated by the medical specialist. Abbott (1988) would label this as client differentiation, as the two professional groups serve different patient groups. By restricting nurse specialists' prescribing practices to 'routine patients', medical professionals kept the professionally 'higher status' patients for themselves. In terms of professional dominance, one could even say that the introduction of nurse specialist prescriptive authority enabled medical specialists to assign professionally 'dangerous' routine work to nurse specialists and, in so doing, enhance their professional position and reinforce the subordinate position of nursing [23]. Hence, in line with other studies on enacted professional jurisdictions [33], medical professionals seem to shape new extended nursing roles in such a way as to ensure their continued professional dominance.

### **9.7.3. Workplace jurisdiction and legal jurisdiction over prescribing**

As said before, there is a considerable discrepancy between the division of jurisdictional control over prescribing at the macro (legal) level and at the micro (workplace) level. As found earlier, legal jurisdiction seems to have a rather vague relation to professional workplace realities [23,26,27].

Allen [24] and Currie *et al.* [30] noted that features of the work setting, such as the recognition (or lack of recognition) of new sets of knowledge and skills in work roles, mediate the legal division of labour. In the case of nurse specialists' prescriptive authority, we found that hospitals, medical boards and/or nurse specialists applied additional rules and limitations to nurse specialists' legal authority to independently prescribe medicines. Moreover,

nurse specialists, on their own initiative, often consulted with their medical specialist before or after prescribing a medicine. This is understandable, given that nurse specialists obtained prescriptive authority only recently and may feel they are in a learning process. Yet this limited their broad legal prescriptive authority in everyday practice to a much narrower jurisdiction. However, it remains unclear what the exact mechanisms and factors are that explain the large variety of jurisdictional settlements found in the workplace when it comes to nurse specialists' prescriptive authority. Because the introduction of prescriptive authority for nurse specialists can be looked upon as a service reform, explanatory factors could, for example, be sought in differences in work culture, network organisation and leadership styles among the different hospitals and wards [48]. These meso-level factors should be taken into account for a broader understanding about the discrepancy between macro- and micro level when it comes to jurisdiction over prescribing. It may for example be possible that within relatively small wards, where strong ties exist between nurse specialists and medical specialists, medical specialists may hand over tasks more easily than within large hierarchy-based wards, where ties between the different healthcare professionals may be much looser and job roles and task descriptions are more formalised, i.e. restricted, as a result. This would be in line with our findings that years of accumulated cooperation and trust between nurse specialists and medical specialists appeared to result in good cooperation where the prescribing of medicines was concerned. However, this also raises the question of how sustainable this source of good cooperation, i.e. trust, will turn out to be in the future. After all, if prescribing nurse specialists start to change jobs, medical specialists will have to cooperate with nurse specialists who they hardly know and hence have no 'trust relationship' with.

The great variety in the extent to which and way in which nurse specialists' legal prescriptive authority has been implemented across hospitals and hospital wards is somewhat remarkable. It means that "prescribing by nurse specialists", as spoken about by policymakers, healthcare professionals and patients alike, is nothing more than an umbrella term. Two people could be using the same expression while having a significantly different reality in mind. This may hamper the professionalisation of the nursing profession. After all, it is the knowledge that a profession possesses which defines the profession, as stated by Abbot [23]. If the knowledge level of the profession is ambiguous, as it is in terms of what is understood by nurse prescribing, the status of the profession itself may become ambiguous.

The discrepancy that we found between the division of jurisdictional control over prescribing at the legal level and at the workplace level has implications for policy expectations as well. If, as our results suggest, nurse specialists in the workplace prescribe less often and in a less independent way than their legal authority allows them to do, expectations about the potential impact of nurse specialist prescribing on healthcare may need to be adjusted. The positive effects of prescribing by nurse specialists, for example in terms of cost efficiency, may be lower than expected and/or hoped for. Moreover, the prescribing of medicines is by no means the only task substitution that is taking place within nursing. Task substitution is increasingly seen as a solution to current problems in health care. Our study shows that the implications and effects of task substitutions should not only be studied and discussed at legal macro level, but also at organisational level. However, prescribing is a relatively new task for Dutch nurse specialists. It is quite possible that nurse specialists and medical specialists need to go through a habituation period. Perhaps in the future, nurse specialists will start prescribing more frequently and for a wider range of medicines, doing so in a more independent way. Simultaneously, the variety across hospitals and wards found shortly after the introduction of nurse specialists' prescriptive authority may diminish as well and a more 'common practice' may develop. Finally, attention should be paid to the financial organisation of nurse prescribing. Our results suggest that in the Netherlands, the financing structure of nurse specialists' prescriptions is opaque and confusing. Almost all nurse specialists in our study prescribed under the General DataManagement-code (Algemeen GegevensBeheer-code or AGB-code in Dutch) of their medical specialist. Hence, their prescriptions are untraceable for insurers and policymakers in the financial systems, making it impossible to evaluate nurse specialists' prescriptive authority on a cost-efficiency basis. Yet cost efficiency was precisely one of the main reasons for introducing nurse specialists' prescriptive authority [10,14,15,38]. Internationally, there is a need for detailed evaluations of the cost effectiveness of nurse prescribing as well [49-51]. However, this is only one possible criterion for the evaluation of nurse specialist prescribing. Internationally, it has been shown, for example, that patients are generally more satisfied with prescribing by nurses or nurse specialists compared with physicians [52] and that nurses obtain higher medication adherence rates with patients compared with medical specialists [53]. These are important aspects in their own right which may indirectly also lead to increased cost efficiency.

#### **9.7.4. Limitations**

Several limitations of the study bear mentioning. It is likely that our sample of prescribing nurse specialists is not representative for all nurse specialists in the Netherlands. After all, the nurse specialists who participated in our study were already prescribing medicines and can be considered highly motivated early adapters in that regard. Hence, prescribing may be less developed among other hospitals and/or nurse specialists and prescribing might take place in a less independent way. Moreover, the nurse specialists who participated in our study proposed the medical specialists we approached for interviewing. Again, this may have created a biased subsample, as it is likely that nurse specialists selected medical specialists with whom they have a good cooperative relationship. Nonetheless, our study adds to the relatively small body of research studying the division of jurisdictional control at the micro or workplace level [20,26,27]. By uncovering the discrepancy between nurse specialists' legal jurisdiction over prescribing and their jurisdiction in the work arena, it shows that professional negotiations over jurisdiction take place at both the macro level and the micro levels, with different divisions of jurisdictional control as a result.

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# 10

## General discussion



In the current climate of cost containment in health care, governments increasingly see the shifting of tasks from physicians to nurses as a suitable policy response. At the same time, the nursing profession has been undergoing a process of professionalisation in many Western countries over the past decades. These developments have resulted in nurses taking up new positions and new tasks, one of the most prominent being the prescribing of medicines. The introduction of nurse prescribing has consequences for the relationship between the nursing and medical professions and for the division of jurisdictional control over the prescribing task. This thesis provides an overview of the evidence for the effectiveness of nurse prescribing, the forces that led to the introduction of nurse prescribing and the legal, educational and organisational conditions under which nurse prescribing has been implemented internationally. Furthermore, the processes were examined that were going on within and at the interface between the nursing and medical professions in the Netherlands concerning nurse prescribing and the division of jurisdictional control over prescribing between both professions, at the legislative level and in the workplace.

In this chapter, the main findings of the thesis are summarised and discussed, the methodological considerations of the study are described, implications for policy and clinical practice are presented and recommendations for future research are made.

## **Main findings of the thesis**

### ***The effects of nurse prescribing compared to physician prescribing***

A growing number of countries are introducing nurse prescribing. At the same time, questions have been raised about whether nurse prescribing is safe and clinically appropriate [1-7]. A systematic review of the literature was conducted to summarise and synthesise the evidence for the effectiveness of nurse prescribing compared to physician prescribing (Chapter 2). Thirty-five relevant studies were identified of which all but five had a high risk of bias. The results showed that nurses prescribe medication for the same number of patients as physicians and they prescribe comparable types and doses of medicines. Clinical parameters, perceived quality of care and patient satisfaction were the same or better for nurse prescribing compared with physician prescribing. Conclusions must still remain tentative due to the

methodological weaknesses in this body of research. Yet, on the basis of this review, there is no reason to doubt the quality and clinical appropriateness of nurse prescribing.

### ***Forces leading to the introduction of nurse prescribing and conditions for nurse prescribing***

To study the conditions under which nurse prescribing has been implemented internationally, a second systematic review of the literature was conducted and an international survey was performed among representatives of professional nursing and medical associations and government bodies (Chapters 3 and 4). These studies also examined whether internal forces (coming from within the nursing profession itself) and external forces (general societal forces) influenced the division of jurisdictional control over prescribing, as suggested by our theoretical framework [8]. It was found that the content of nurse prescribing training programmes is fairly similar across countries and training is often provided at the Master's level. The conditions under which nurses prescribe medicines vary considerably though, from countries where nurses prescribe independently to countries in which prescribing by nurses is only allowed under strict conditions and the supervision of physicians. Therefore, a variety of jurisdictional settlements between the nursing and medical professions concerning prescribing were identified. Yet in most countries, nurses are in a subordinate position when prescribing and the jurisdiction over prescribing remains predominantly with the medical profession. It was also found that a range of different internal and external forces led to the introduction of nurse prescribing internationally and these forces seemed to be related to the jurisdictional settlements in place; with forces focusing on efficiency appearing to lead to more extensive nurse prescribing rights. Moreover, survey respondents from nursing and medical associations cited different forces as being important for the introduction of nurse prescribing, such as improving the cost-effectiveness of the healthcare system or improving the use of nurses' skills and capacities. This can be conceived as professional 'problem construction', often used for retaining or obtaining jurisdiction over tasks.

### ***Professional knowledge claims***

The views of Dutch nursing and medical associations and other relevant parties on the reasons for implementing nurse prescribing in the Netherlands were also explored (Chapter 5). Semi-structured interviews were conducted

with thirteen representatives of nursing associations, medical associations and other relevant parties in the field of nurse prescribing in the Netherlands. All the parties interviewed agreed that the fact that nurses were sometimes already prescribing medicines, a state of affairs termed a 'tolerance situation' (Dutch: *gedoogsituatie*) because a formally unlawful situation is openly tolerated, was the main reason for starting a process to introduce legal nurse prescribing. This uniformity is remarkable in the light of our theoretical framework [8], which predicts that professions will use and 'construct' the reasons for the introduction of nurse prescribing to their own advantage. However, other reasons were also mentioned. To further study the 'knowledge claims' – the claims that professions make to unique bodies of knowledge and/or expertise that they possess – that were used by the medical and nursing professions in the Netherlands when it came to the introduction of nurses' prescriptive authority, we supplemented our semi-structured interviews with in-depth document analysis. The results of the subsequent thematic analysis (Chapter 6) showed that the nursing and medical professions used a variety of knowledge claims. Some of these claims, used by both professions, emphasised the routine and everyday knowledge character of nurses' prescribing task. These are claims that are well suited for obtaining legal prescriptive authority; after all, if nurses are already prescribing, then why not make it legal. At the same time, these claims generate little professional status because of the high degree of routine in the prescribing practices and the sense that 'anyone could do it'. Both professions also used other claims that focused on the so called 'indeterminate' or unique knowledge skills of both groups of professionals, which is considered a strong claim for retaining or obtaining (higher) professional status. Yet in a jurisdictional conflict, it is difficult to demonstrate this intangible, unique set of skills and therefore these knowledge claims are not always effective.

### ***Views and expectations concerning nurse prescribing***

Chapter 5 also described the views of representatives of Dutch national nursing and medical associations and other relevant parties on the impending introduction of nurse prescribing. The interviews showed that medical associations were generally less positive about nurses' impending prescriptive authority compared to nursing associations, and they differed in their views about the conditions under which nurses should prescribe. Medical associations, for example, preferred having nurses prescribe within mandatory partnerships, including at least one physician.

In addition to the views at the professional associational level, this thesis also studied the views of individual healthcare professionals on nurse prescribing, because individual factors in the workplace (micro level) can influence and change legal jurisdictions [9,10]. The views of the relevant individual healthcare professionals in the Netherlands were explored in a survey study among national samples of RNs, nurse specialists and physicians (Chapters 7 and 8). First of all, we examined to what extent professional views on nurse prescribing are subject to change under the influence of altering internal and external forces, as our theoretical framework suggests. In 2006, NIVEL had performed a national survey among RNs in the Netherlands concerning their views on nurse prescribing and prescribing practices. In 2012, this survey was repeated to determine whether and how RNs' views and practices concerning nurse prescribing had changed in the intervening years (Chapter 7). Overall, the prescribing views of Dutch RNs changed little between 2006 and 2012, despite several internal and external forces that might have affected them, such as more educational opportunities for nurse prescribing training. The number of RNs feeling inadequately equipped to prescribe remained high, with insufficient knowledge to prescribe being the most important reason for feelings of inadequacy in both survey years. Remarkably, the number of RNs who felt the support from their organisation to be insufficient for prescribing actually increased somewhat.

Secondly, we studied the views of RNs, nurse specialists and physicians on the consequences of nurse prescribing for the quality of care, the nursing and medical professions, and the relationship between the medical and nursing professions (Chapter 8). By exploring the views of RNs, nurse specialists and physicians, it was possible to identify potential obstacles and barriers to the implementation and uptake of nurse prescribing. The survey showed that all groups agreed that nurse prescribing benefits nurses' daily practice and the nursing profession. There were few concerns about the negative consequences for physicians' practice and the medical profession. It was only on issues surrounding the quality of care and patient safety that doctors showed more concern, albeit still mild, than RNs and nurse specialists. These results suggest that RNs, nurse specialists and physicians generally held neutral to moderately positive views on nurse prescribing, which is beneficial for the implementation and potential success of nurse prescribing in practice.

### ***Division of jurisdictional control over prescribing in the workplace***

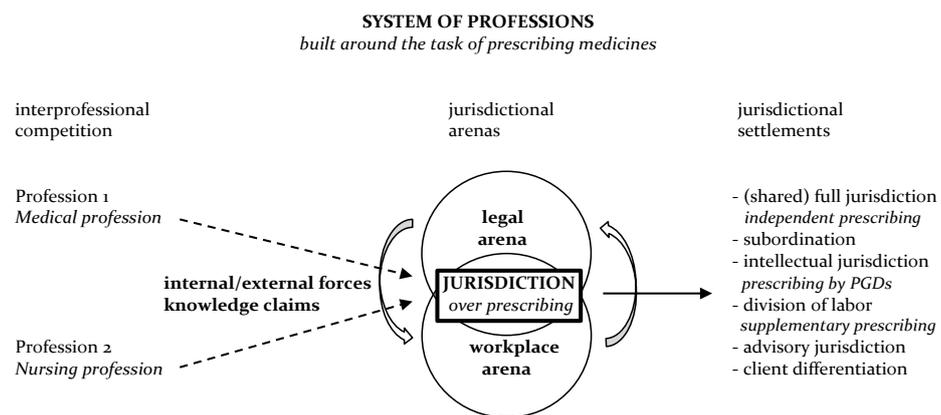
To study how nurse prescribing takes shape in everyday healthcare practice, we conducted a multiple-case study. This involved in-depth interviews with nurse specialists (with a Master's degree in Advanced Nursing Practice) and medical specialists, non-participant observation of nurse specialists' prescribing consultations and document-analysis. Great diversity was found in the extent to which and the way in which nurse specialists' legal prescriptive authority has been implemented. There was considerable variability in the amount and range of medicines that nurse specialists were allowed to prescribe. Moreover, whilst prescribing, nurse specialists used a wide range of different supporting documents with different levels of applicability. Yet the manner in which the prescribing process took place was fairly similar for all prescribing nurse specialists: they regularly consulted medical specialists about their prescribing decisions and almost always did so in an informal manner.

### **Theoretical interpretation of findings**

When nurses start prescribing medicines, they enter an area that has traditionally been the sole domain of the medical profession (Buckley, Grime, & Blenkinsopp, 2006; Fisher, 2010; Goundrey-Smith, 2008). Hence, the introduction of nurse prescribing touches on issues of professional domains and the division and reallocation of jurisdictional control over prescribing (Abbott, 1988). As predicted by our theoretical framework, we found that medical and nursing professions at the professional associational level try to influence the division of jurisdiction over prescribing by using various internal and external forces in their knowledge claims, i.e. forces coming from within the professions themselves and more general societal forces. By focusing, for example, on an existing shortage of physicians or governmental striving for a more cost-effective healthcare system, they try to influence the legal conditions under which nurses are or will be allowed to prescribe. At the same time, it was found that at the individual professional level, views concerning nurse prescribing are relatively stable and little affected by changes in internal and external forces, such as policy changes or increased professional educational opportunities. Moreover, nurses, nurse specialists and physicians were found to hold fairly comparable neutral to positive views on nurse prescribing.

By studying the legal and educational conditions under which nurses are prescribing internationally, it was possible to identify the legal jurisdictional settlements between the medical and nursing professions over prescribing. These conditions vary considerably, from countries where nurses prescribe independently to countries in which prescribing by nurses is only allowed under strict conditions and the supervision of physicians. These differences are reflected in the legal jurisdictional settlements between the nursing and medical professions concerning prescribing that could be discerned at the macro level. In some countries, where nurses are able to independently prescribe medicines according to the law, with a fair range of prescribing freedom concerning medicine choice, nurses share (full) legal jurisdiction over prescribing with the medical profession (see Figure 10.1). This is the case, for example, in the UK for independent nurse prescribers. In most countries though, the legal conditions under which nurses are prescribing lead to legal jurisdictional settlements in which nurses are in a subordinate position to doctors when prescribing, for example because the medical profession drafts the protocols or guidelines governing nurse prescribing.

Figure 10.1 Schematic representation of the theoretical framework used in this thesis



By studying nurse prescribing in the Netherlands at the level of the workplace – by examining the views and practices of individual healthcare professionals, the implementation of legal and educational conditions in everyday practice

and the organisational conditions in place – we were able to explore the extent to which nurses' legal prescriptive authority resembles workplace jurisdiction over prescribing. After all, it has been shown that workplace jurisdictions can have a distorting influence on legal structures (Allen, 1996; Bechky 2003). In the Netherlands, nurse specialists' legal prescriptive authority is comparable to that of physicians, as both professional groups are allowed to independently prescribe any licensed medicine for any medical condition within their specialism and competence. Even though physicians have a significantly wider field of competence, in the legal arena nurse specialists and physicians share full jurisdiction over prescribing. The results of our study showed however that on the work floor there were big differences in the extent to which and way in which nurse specialists' legal prescriptive authority has been implemented. There was considerable variety across hospitals and hospital wards in the number and range of medicines that nurse specialists prescribed and the supporting documents that they used.

From a macro point of view, the jurisdictional division with regard to prescribing in the Netherlands is unambiguous. Yet due to the great variety in the manner in which this legal framework is currently being implemented and drawn up in the workplace, a number of jurisdictional settlements coexist for nurse specialist prescribing in daily clinical practice. Most of the time, medical specialists still play a large role in nurse specialists' prescribing processes, thereby creating a situation of jurisdictional subordination. Sometimes medical specialists drafted strict prescribing protocols for nurse specialists, so that the 'intellectual jurisdiction' over prescribing remained with the medical profession. In other cases, we found that nurse specialists were allowed to prescribe for 'routine patients', while the more complex patients were exclusively treated by the medical specialist. Abbott [8] would label this as client differentiation, as the two professional groups serve different patient groups. Hence, our results suggest that there is a considerable discrepancy between the division of jurisdictional control over prescribing at the legal (macro) level and at the workplace (micro) level. The legal conditions can be considered as demarcating the boundaries within which physicians and nurses can act in practice when it comes to nurse prescribing. In practice, organisations and individual healthcare professionals subsequently develop their own nurse prescribing practices and organisation, within the boundaries of the legal framework, which leads to substantial variation. For example, while the law states that nurse specialists are allowed to prescribe all medicines within their area of expertise and competence, some hospitals may

decide to apply additional rules and limit the number of medicines that nurse specialists are allowed to prescribe, while other hospitals do not do so. This means that in everyday clinical practice, nurse specialists in hospital A may have different prescribing powers than equivalent nurse specialists in hospital B, even though their legal prescriptive authority is the same.

Overall, we found considerable differences between the macro level and the micro level where nurse prescribing is concerned. At the macro level, there appears to be more of a jurisdictional conflict over legal prescribing rights, with professional medical associations sometimes strongly resisting the introduction of legal nurse prescribing (in a particular form). The views of individual nurses and physicians on nurse prescribing are fairly similar though. Hence, there seem to be different dynamics at the two levels. These different dynamics have been found earlier, for example with regard to jurisdictional issues between dentists and dental hygienists [11]. Moreover, we found considerable variation in what is legally allowed and what is done in practice where nurse prescribing is concerned. Thus, the results of our study confirm Bechky's observation that it is important to study jurisdiction in the workplace and not focus solely on macro-sociological processes, as most analyses of inter-occupational jurisdictional control tend to do [10].

### **Methodological considerations**

This thesis is one of the first to provide an overview of the conditions under which nurses are prescribing internationally and to look theoretically at the consequences of nurse prescribing for the processes within and between the nursing and medical professions and for the division of jurisdictional control over prescribing at the macro and micro levels. One of the strengths of this thesis is that, in contrast to most studies in the sociology of professions [9,10,12], professional negotiations over jurisdiction were studied at both the macro level and the micro level of analysis. This is important, as it has been shown that workplace jurisdictions can have a distorting influence on legal structures. Moreover, the individual studies in this thesis employed a variety of quantitative and qualitative methods, including systematic literature research, questionnaire surveys, in-depth interviews, document analysis and non-participant observations, and combinations of these methods. This increases confidence in the validity of our findings [13].

The in-depth interviews with Dutch representatives of professional nursing and medical associations and other relevant parties, the subsequent thematic analysis and the survey-research among Dutch RNs, nurse specialists and physicians provided insight into the views and attitudes towards nurse prescribing at both the macro level and the micro level of analyses. However, these studies were performed at a time when nurse prescribing was not yet legally allowed in the Netherlands, or only allowed for nurse specialists. While this had the benefit of enabling the identification of potential obstacles and barriers to the implementation and uptake of nurse prescribing prior to its actual introduction in practice, it also raises the question of whether the same results would be found now or in a year's time. After all, nurse prescribing is still in its early, developing stages in the Netherlands and will continue to crystallise over the coming years. The same limitation applies to our multiple-case study of nurse prescribing in the workplace. While the study provides an insightful impression of nurse specialists' prescribing practices, again we are looking at a process that is still evolving. Moreover, this study was limited to hospital settings. There are indications coming from the field that in other Dutch healthcare settings, such as nursing homes, the role of the nurse specialist, including in prescribing medication, is much less developed [14].

Another limitation of this thesis that applies to our sub-studies involving individual professionals is that they probably have more positive attitudes to nurse prescribing than the general population of RNs, nurse specialists and physicians in the Netherlands. In our survey, selective participation may have led to participation by respondents who are interested in and/or more positive about the subject of nurse prescribing, whereas in our multiple-case study the nurse specialists who participated were already prescribing medicines and can be considered highly motivated early adopters in that regard. Moreover, they nominated the medical specialists to be approached for interviewing. Again, this may have created a biased subsample, as it is likely that nurse specialists selected medical specialists with whom they have a good cooperative relationship. This probable bias in the subsample towards more positive attitudes to nurse prescribing limits the generalizability of our findings.

Finally, while this thesis examined professional negotiations over jurisdiction in the legal arena and workplace arena, the patient perspective was largely left unexplored. Patients' experiences with nurse prescribing can be an important perspective from which to evaluate nurse prescribing, though. Our systematic review of the effects of nurse prescribing (Chapter 2) showed that the perceived quality of care and patient satisfaction were the same or better for

nurse prescribing compared with physician prescribing. Moreover, it has been shown that nurses obtain higher medication adherence rates with patients compared with medical specialists or general practitioners [15]. These are important aspects in their own right and may indirectly also lead to more cost-efficiency in health care. This thesis did not look at the influence of patients' attitudes on the division of jurisdictional control over prescribing on the work floor, with patients for example preferring to have their medicines prescribed either by nurses or by physicians. However, in line with earlier research [16], both nurses and physicians in our studies indicated that they doubted how well patients are able to distinguish between the different types of prescribers and they doubted whether the public has much understanding of nurse prescribing. While these are important aspects to study in their own right, it makes it unlikely that patients currently have a big influence on the division of jurisdictional control over prescribing between the medical and nursing profession at either the macro level or the micro level.

### **Implications for policy**

Many countries are transferring tasks, such as the prescribing of medicines, from doctors to nurses in order to improve healthcare quality, efficiency and effectiveness [17-19]. This thesis shows that nurses prescribe appropriately and in comparable ways to physicians. These findings are in line with other studies in which the clinical appropriateness of nurses' prescribing decisions was evaluated [20,21]. Nurse prescribing seems to have no negative consequences for the quality of care and seems to increase patient satisfaction, even though conclusions must remain tentative. Hence, nurse prescribing seems to be a valuable addition to healthcare policy.

Whether all policy expectations for nurse prescribing as outlined above are or will be met in the near future, is doubtful. Our results show that especially where financial issues are concerned, much uncertainty and misperception exists, both internationally and in the Netherlands. While cost-efficiency is an important reason for governments to introduce nurse prescribing, detailed evaluations of the cost-effectiveness of nurse prescribing are lacking [19,22,23]. This thesis shows that the financing structure of Dutch nurse specialists' prescriptions is opaque and confusing to most of the stakeholders. Moreover, even though nurse specialists can request their own General DataManagement code (*Algemeen GegevensBeheer*-code or *AGB*-code in

Dutch) as of January 2013, almost all nurse specialists that participated in our multiple case study (Chapter 9) prescribed under the AGB code of their medical specialist. The AGB-code is a code that is assigned to individual healthcare professionals, practices and institutions. The code is listed on medical bills and is used within the cost claims process in which the healthcare provider informs the health insurer of the care provided, so that the insurer can apply the appropriate rate when reimbursing healthcare expenditure. Because most nurse specialists are still prescribing under the AGB code of their medical specialist, their prescriptions are untraceable in the financial systems for insurers and policymakers, making it impossible to evaluate nurse specialists' prescriptive authority on a cost-efficiency basis. To be able to properly evaluate whether nurse prescribing improves cost-efficiency in healthcare, more attention should be paid to information and implementation issues concerning nurse specialists' personal AGB-code. This is also important in view of the impending change in the Diagnosis Treatment Combinations legislation (in Dutch: *DBC, Diagnose Behandel Combinaties*; the Dutch version of Diagnosis-related Groups) per January 2015. From that moment on, nurse specialists will be legally allowed to open a DBC, as advised by the Dutch Healthcare Authority (NZA) and as approved by the Minister of Health [24,25]. However, it is debatable whether hospitals will be fully prepared and ready to implement this change by then. Moreover, the role of health insurance companies in the process of implementing healthcare policy changes must not be underestimated. In 2013, the Dutch Minister of Health designated nine types of professionals that can act as a clinical head, including the nurse specialist mental healthcare. A number of health insurance companies refused to recognise nurse specialists as a clinical head, leading to significant troubles in everyday mental healthcare practice [26].

Another point of attention for policy makers is the fact that the prescriptive authority for nurse specialists in the Netherlands is part of the so-called experimental article (Article 36A) in the Dutch Individual Health Care Professions Act. After an experimental period of five years, an evaluation study will be carried out. Upon positive evaluation, a permanent arrangement might be included in the law. The four evaluation criteria are quality (safety, patient centeredness and accessibility), effectiveness, expediency and continuity of care [27]. This thesis indicates that, so far, nurse specialists do not prescribe on a large scale in the Netherlands, as many hospitals and/or nurse specialists are still completing the implementation of nurse specialists' prescriptive authority, for example by drafting prescribing protocols or

developing formal formularies. This may have consequences for the upcoming evaluation. Policy expectations regarding the evaluation may need to be adapted to the current situation on the work floor and made more realistic. Moreover, while the evaluation in 2017 is important to gain proper insight into the way nurse specialist prescribing has developed, it should not be conceived of as a 'final' evaluation. Prescribing by nurse specialists is a process that will continue to crystallise over the coming decades. Therefore, it is important to continue monitoring nurse specialist prescribing over the next fifteen to twenty years and adjust legislation and policy if necessary.

Finally, when we started our studies in 2009, it was expected that various categories of Dutch specialised RNs – initially diabetes, lung and cancer nurses – would soon be granted limited prescribing rights. Four years later, only diabetes care- and lung nurses have been allowed to prescribe with the effect from 1 February 2014. Oncology nurses will start prescribing on 1 September 2014 [28]. In the future, more categories of RNs will presumably be granted limited prescribing rights. In 2012, the Dutch Nurses' Association published its new professional profiles for the nursing profession in 2020 [29]. The prescribing of medicines is considered in these profiles to be one of the competencies that a registered nurse should possess in 2020. Yet policy expectations regarding the effects of nurse prescribing, such as improvements in the efficiency, quality and continuity of care, may need to be adjusted, at least in the short term. After all, this thesis demonstrates that the large majority of Dutch RNs have no plans to take the Pharmacotherapy module that is required to obtain prescriptive authority. Naturally, this result should be viewed in the context of the current legislation, in which prescriptive authority will initially only be assigned to three categories of specialised RNs and other categories of RNs may feel little need as yet to take the module. Nonetheless, quite a number of professional associations of categories of specialised RNs have already indicated to the Ministry of Health that they would like to apply for prescriptive authority as well, including prison nurses, dialysis and nephrology nurses, rheumatology nurses, community psychiatric nurses and HIV/AIDS nurses [30,31]. In view of this, the 90.5% of RNs in our survey who have no plans to take the Pharmacotherapy module can still be considered quite high. Internationally, a comparable lack of enthusiasm for undertaking prescribing training and taking up prescribing was found among RNs [32]. This suggests that professional associations of categories of specialised RNs and the Dutch Nurses' Association may be more enthusiastic about making prescribing an integral part of an RN's job than a significant

proportion of their members. Professional nursing associations and policy makers must take care not to get out of touch with the nursing rank and file members.

At the same time, this thesis found that, in general, RNs and physicians hold neutral to moderately positive views on nurse prescribing. This is positive, as supportive attitudes towards nurse prescribing have been shown to be key to its success in everyday practice [33-36]. Yet it is also known that views do not always match behaviour [12]. The slow uptake of nurse specialist prescribing in hospitals that we found may be an indication of this. Moreover, this thesis shows that other factors, such as the financing structure of task substitution, can act as barriers to successful implementation in practice.

### **Implications for practice**

This thesis also demonstrates that some aspects of nurse prescribing can be further improved. One area of attention concerns nurses' prescribing training. Internationally, considerable variation was found concerning the level, duration and place that nurse prescribing training occupies within the various educational systems. However, comparative research into the influence of, for example, either Bachelor's or Master's level prescribing training on prescribing outcomes is lacking, which makes the variation found seem quite arbitrary. Two-thirds of the Dutch RNs in our survey who had already taken the prescribing module still felt they had insufficient knowledge to prescribe medication. This finding is in line with other research into nurse prescribing training in which questions have been raised about whether current educational programs prepare nurses sufficiently for prescribing [2,7,37]. Therefore, it is suggested that educational programmes should pay more attention to how well their curricula fit nurses' needs when it comes to prescribing in everyday health care practice. This is especially important since it has been shown that training and education can be crucial factors in the successful implementation of nurses' prescribing role [33].

Another point for attention concerns the communication, cooperation and support between healthcare professionals when it comes to nurse prescribing. In the literature, it has been suggested that some form of formal apprenticeship model helps support the processes of service redesign, such as nurse prescribing, so that doctors and nurses can gain confidence that nurse will be safe prescribers [38]. We found that Dutch nurse specialists and

medical specialists in the workplace communicate a lot about nurse specialists' prescribing practices, almost always in an informal way. So at present, at least in the Netherlands, formal apprenticeship models seem unnecessary. Yet more formal arrangements may be needed to maintain this good practice in future. After all, it is expected that the number of prescribing nurses and nurse specialists will grow considerably over the next few years. Support and supervision may need to become more structured or formalised to maintain a workable situation. The 'Guide to the division of responsibilities when collaborating in health care' (Dutch: '*Handreiking verantwoordelijkheidsverdeling bij samenwerking in de zorg*') that was developed by ten leading healthcare associations in the Netherlands in 2010, including the Royal Dutch Medical Association (KNMG) and the Dutch Nurses' Association (V&VN) [39], may be a good starting point to work from in this regard. It contains specific points of attention for developing agreements on responsibilities, such as the need to be aware of one's own and others' knowledge, skills and limits. However, as the need for collaborative structures may differ between healthcare organisations, depending on size and the number of prescribing nurse specialists and RNs, organisations should always adjust policies to suit their own needs.

Supportive team working has been shown to be a key factor in the success of nurse prescribing, and prior working relationships have been found to reduce anxiety about nurse prescribing [33-36]. Nurse specialists and medical specialists in our study also mentioned that years of accumulated cooperation led to mutual trust, which eased their cooperative relationship in prescribing. However, the question is how sustainable this foundation for successful cooperation in prescribing – this trust – will turn out to be in the future. After all, if more nurse specialists start prescribing and if prescribing nurse specialists change jobs and start working in new environments, medical specialists will eventually have to cooperate with nurse specialists whom they hardly know and with whom they have no 'trust relationship'. This may hamper the development of nurse prescribing. Another point for attention in this regard concerns the relationship between nurse specialists and non-prescribing nurses. Nurse prescribing changes the dynamics of the team and prescribing nurses might experience some resentment from their non-prescribing nurse colleagues. While little research has been conducted into the effects of nurse prescribing on the relationship between prescribing and non-prescribing nurses, the evidence to date suggests that working relationships generally function well [35,40,41]. To facilitate this, it is

recommended that preparatory information about nurse prescribing be provided to all team members by trainee nurse prescribers, allowing other team members to prepare for the new role.

This thesis also demonstrates that the level of organisational readiness for nurse prescribing is generally low. More than 40% of the RNs in our survey felt a lack of support from their organisation for nurse prescribing, while our multiple case study confirmed that on most hospital wards, nurse specialists' prescriptive authority is not yet fully institutionalised. Most nurse specialists are still waiting for organisational conditions to be arranged in order to complete the implementation of their prescriptive authority, for example obtaining personal prescription pads. While this might partly be due to the fact that nurse prescribing in the Netherlands is still in its early stages, this lack of organisational readiness, in terms of having structures and processes in place to enable nurse prescribing, is a frequently reported source of frustration and delay internationally as well [34,42,43]. As it has been found to seriously hamper the implementation of nurse prescribing across different countries [44,45], attention should be paid to eliminating these organisational limitations. In the Netherlands, several guides and handbooks have already been published to help organisations implement nurses' prescriptive authority, such as the 'Guide to the implementation of task substitution' (Dutch: *Handreiking implementatie taakherschikking*), jointly written by the Royal Dutch Medical Association (KNMG), the Dutch Nurses' Association (V&VN) and the Netherlands Association of Physician Assistants (NAPA) [46]. Considering the inadequate organisational readiness for nurse prescribing, this thesis suggests that the use and implementation of these guides and handbooks within organisations needs to be improved. The Royal Dutch Medical Association is already organising meetings to discuss the 'Guide to the implementation of task substitution' and it is recommended that more of these meetings be organised. Moreover, while this Guide is an important and comprehensive reference work, it is recommended that in addition, a uniform compact checklist consisting of a couple of pages should be developed. This checklist should provide an overview of all issues that nurse prescribers and organisations should be aware of when implementing nurse prescribing, such as making sure that new prescribers' names are added to prescription pads or making sure that new prescribers have access to electronic prescription systems. Nursing and medical associations can take the initiative to develop this checklist. In the UK, for example, the Nursing & Midwifery Council has developed the 'Standards of proficiency for nurse and midwife prescribers'

[47]. These standards are specifically aimed at nurse prescribers and explain all aspects of prescribing.

One final point of attention concerns the financial organisation of nurse prescribing and more broadly the deployment of nurse specialists in the Netherlands. From our studies, it became clear that if hospitals deploy a nurse specialist instead of a physician assistant to take over tasks from physicians, the nurse specialist is paid from the nursing budget. At the same time, there is no expenditure from the medical budget, since a nurse specialist falls within the nursing job matrix (Dutch: verpleegkundig beroepenhuis). This means that the nursing budget is used to employ a healthcare professional who takes over tasks that would normally have been performed by a physician. Hence, while the volume of nursing work remains the same, less money is available for nursing. Furthermore, medical specialists save time while their budget remains intact. This funding structure should be studied in more detail and it probably needs some adjustment, especially in view of the anticipated growth in the number of nurse specialists.

### **Implications for future research**

By comparing nurse prescribing across different Western-European and Anglo-Saxon countries, this thesis shows that there is considerable variation in terms of the legal, educational and organisational conditions under which nurses prescribe. However, the effects of these different conditions on nurse prescribing outcomes have not been studied. It is unclear, for example, whether nurse prescribers' educational level, e.g. with a Bachelor's or a Master's degree, influences the quality of the prescriptions being issued. Moreover, we also found that nurses' prescribing training is financed in different ways. Sometimes nurses have to pay for the educational costs themselves while in other countries funding is made available through the government and sometimes employers, nurses and/or the government share costs.

There is no evidence base for any of these financing structures. Yet in the current climate of cost containment in healthcare, it is important to study which of these financial structures is most beneficial for nurse prescribing. Perhaps there is no single 'best practice' and each healthcare system needs its own distinctive financing structure. But studies are needed to ascertain that.

In view of the policy expectations concerning nurse prescribing, more cost-effectiveness studies are needed as well. While a small-scale study in an accident and emergency department in the Netherlands provides some initial indications that replacing one GP, out of a team of five GPs, by a nurse specialist can yield cost savings, the results of this study must be treated with cautiousness and are not generalisable to other settings [48]. Moreover, macro-level variables, such as training costs, should be taken into account. Also, long term studies in various settings are required to establish whether the changes that were found are long-lasting or merely reflect a learning effect in the context of a trial [33]. As nurse prescribing in the Netherlands is still in its early developing stages and will continue to crystallise over the coming years, it is also recommended that our in-depth multiple-case study (Chapter 9) be repeated in a couple of years to monitor the development of nurse prescribing over time.

Finally, this thesis is one of the first to look more theoretically at the consequences of nurse prescribing for the processes within and between the nursing and medical professions and for the division of jurisdictional control over prescribing at the macro and micro levels. The findings reported in this thesis raise new questions in this regard. While it was shown that there is a large discrepancy between nurse specialists' prescriptive authority in the work place and their legal prescriptive authority, it is important to study whether this discrepancy persists or diminishes as years go by. More long-term studies into (possible) changes in jurisdictional control over prescribing are needed. Furthermore, it is important to examine whether there are differences between healthcare settings in this regard. A more general recommendation for studies of professional negotiations over jurisdiction is to pay more attention to organisational and individual factors and their influence on legal jurisdiction. This thesis, by showing the discrepancy between the legal arena (macro level) and the work arena (micro level) in terms of jurisdiction, demonstrates the need for more multi-level studies.

## **Conclusion**

The studies presented in this thesis have demonstrated that nurses prescribe appropriately and in comparable ways to physicians. Patient outcomes are therefore comparable and it was found that patients are generally more or equally satisfied with care received by nurse prescribers compared to

physicians. It was also found that nurse prescribing touches on issues of professional domains and division and reallocation of jurisdictional control over prescribing. Nursing and medical professions try to influence the conditions under which nurses are allowed to prescribe by using various internal forces (coming from within the nursing and medical professions themselves) and external forces (general societal forces). The nursing profession has for example claimed that nurses should have broad prescribing rights as this would do justice to nurses' skills and capacities, whereas the medical profession has tried to limit nurses' prescriptive authority by only focusing on cost-efficiency claims. The legal, educational and organisational conditions under which nurses prescribe medicines vary considerably across countries, from countries where nurses prescribe independently to countries in which prescribing by nurses is only allowed under strict conditions and the supervision of physicians. These differences are reflected in the jurisdictional settlements between the nursing and medical professions concerning prescribing. In some countries, nurses share (full) legal jurisdiction with the medical profession, but in most countries legal jurisdiction over prescribing remains predominantly with the medical profession. In the Netherlands, great diversity was found in the extent to which and way in which nurse specialists' legal prescriptive authority had been implemented in everyday practice. Some nurses were allowed to prescribe medication fairly independently, while others had strict formularies in place and discussed almost all of their prescriptions with a medical specialist. Hence, even though 'nurse prescribing' suffices as an umbrella descriptor term, the actual practice it refers to varies considerably, both between and within countries. As nurse prescribing is still in development and prescriptive authority is continually being adjusted and sometimes extended, further research will have to tell whether the existing differences are permanent or whether the huge 'nurse prescribing' umbrella will gradually shrink to smaller proportions.

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## **Summary**



Nurses prescribe appropriately and in comparable ways to physicians. Yet the legal, educational and organisational conditions under which nurses prescribe medicines vary considerably across countries, from countries where nurses prescribe independently to countries in which prescribing by nurses is only allowed under strict conditions and the supervision of physicians. In the Netherlands, categories of specialised registered nurses have limited legal prescribing rights, while nurse specialists have more extensive prescribing rights. On the work floor, there is great diversity in the extent to which and way in which nurse specialists' legal prescriptive authority has been implemented. Because of the prescribing protocols and formal and informal agreements in place, the jurisdiction that Dutch nurse specialists have on the work floor over prescribing is often much more limited than their legal prescriptive authority. Each chapter of this thesis is briefly summarised in the following pages.

### ***Introduction***

The general introduction (**Chapter 1**) describes the background and aim of this thesis. Over the past decades, the combined processes of task substitution and professionalisation within nursing have resulted in nurses taking up new positions and new tasks. One of the most prominent developments in this regard has been the partial substitution by nurses for doctors in the task of prescribing medicines. The number of countries that have introduced nurse prescribing has grown considerably over the past few years. In view of this development, important questions have been raised about whether nurse prescribing is safe and clinically appropriate.

When nurses start prescribing medicines, they enter an area that has traditionally been the sole domain of the medical profession. This has consequences for the relationship between both professions and for the division of jurisdictional control over the prescribing task. This thesis addresses these issues from a sociology of professions perspective, taking Andrew Abbott's (1988) work on jurisdiction as the starting point. According to Abbott, professions exist in an interdependent system in which they compete with each other for control or jurisdiction over tasks, in this case the prescribing of medicines. Jurisdiction is important for professions as it is their means of professional livelihood, which gives them status and power. Hence, professions compete with each other for jurisdiction, both legally and on the work floor, with various possible outcomes.

This thesis addresses the effects of nurse prescribing, the forces that have led to the introduction of nurse prescribing and the conditions under which nurse prescribing has been realised in Western European and Anglo-Saxon countries. In addition, the views and expectations of Dutch nursing and medical stakeholders, nurse specialists, registered nurses and physicians towards nurse prescribing are described as well as the ways in which nurse specialists prescribe in everyday clinical practice.

***The effects of nurse prescribing compared to physician prescribing***

**Chapter 2** presents a systematic international literature review of the effects of nurse prescribing when compared to physician prescribing on the quantity and types of medication prescribed and on patient outcomes. Thirty-five relevant studies were identified. The results showed that nurses prescribe in comparable ways to physicians. They prescribe for equal numbers of patients and prescribe comparable types and doses of medicines. Studies comparing the total amount of medication prescribed by nurses and doctors showed mixed results. Clinical parameters were the same or better for treatment by nurses compared to physicians, the perceived quality of care was similar or better and patients treated by nurses were just as satisfied or more satisfied. However, conclusions remain tentative due to the methodological weaknesses in this body of research. Nonetheless, the overall generally positive findings indicate that nurses prescribe in similar ways to doctors. Hence, concerns about whether nurse prescribing is safe and clinically appropriate appear to be unnecessary and there is no reason, on clinical grounds, to prevent nurses from prescribing medicines.

***Forces leading to the introduction of nurse prescribing and conditions for nurse prescribing***

**Chapter 3** reports on a second systematic international review of the literature. This review synthesises the available information on the forces within and outside the nursing profession that led to the introduction of nurse prescribing internationally and the ways in which nurse prescribing is realised in Western European and Anglo-Saxon countries. A comprehensive search of six literature databases and seven websites was performed, which identified 124 relevant publications. The results showed that a diversity of external and internal forces led to the introduction of nurse prescribing, such as the objective of creating quicker or more efficient patient access to medicines and meeting the medication needs of patients in remote areas who

were often suffering as a result of a shortage of physicians. The review also showed that the legal, educational and organisational conditions under which nurses prescribe vary considerably. In some countries nurses share jurisdiction over prescribing with the medical profession, for example in the UK, but in most countries jurisdiction remains predominantly with the medical profession, and nurses who prescribe are in a subordinate position.

To further study the conditions under which nurse prescribing was implemented internationally and the forces that have led to the introduction of nurse prescribing, an international survey was conducted among representatives of professional nursing and medical associations and government bodies. This study is described in **Chapter 4**. A total of 39 respondents from ten countries completed the questionnaire, with medical associations having a lower response rate. Respondents from nursing and medical associations cited different forces as being important for the introduction of nurse prescribing. Respondents from medical associations almost exclusively mentioned forces that made the nurse prescribing initiative a necessity, such as workforce shortages, while respondents from nursing associations frequently brought up reasons with less immediate urgency, such as the possibility to make better use of nurses' skills. This can be conceived as professional 'problem construction', often used for retaining or obtaining jurisdiction over tasks. For example, by solely stressing the forces that make nurse prescribing an inevitable necessity, the medical profession may have strategically tried to retain as much jurisdictional control as possible. The study also showed that the conditions under which nurses prescribe medicines vary considerably. Considerable variation was found across countries, for instance, regarding the level, duration and place that nurse prescribing training occupies within the various educational systems. Finally, much uncertainty was reported among respondents about the financial organisation of nurse prescribing. This is striking, as nurse prescribing is often introduced to increase cost-efficiency in health care.

### ***Professional knowledge claims***

While Chapters 1 to 4 are internationally focused, Chapters 5 to 9 study nurse prescribing in the Netherlands. **Chapter 5** describes the results of semi-structured interviews with thirteen representatives of nursing associations, medical associations and other relevant parties in the field of nurse prescribing in the Netherlands. All interviewed parties agreed that the fact

that nurses were sometimes already prescribing medicines, a state of affairs termed 'tolerance situation' (in Dutch: *gedoogsituatie*) in which a formally unlawful situation is openly tolerated, was the main reason for starting a process for introducing nurse prescribing. This was different from the results we found internationally and remarkable in light of our theoretical framework, which predicts that professions would use and 'construct' the reasons for the introduction of nurse prescribing to their own advantage. The fact that all the parties involved openly spoke about the 'tolerance situation' may be a typical Dutch phenomenon and can be found in other Dutch policy areas as well.

The interviews also showed that representatives of medical associations were somewhat less positive about nurses' impending prescriptive authority compared to representatives of nursing associations, and that they differed in their views about the conditions under which nurses should prescribe. Representatives from medical associations, for example, preferred nurses to prescribe within mandatory partnerships, including at least one physician, while representatives from nursing associations pleaded for independent prescribing rights. This shows that the medical profession wanted to retain as much control over prescribing as possible, while the nursing profession tried to obtain some of this control or jurisdiction over prescribing.

We completed our semi-structured interviews with an in-depth document analysis. **Chapter 6** described the results of the resulting subsequent thematic analysis. It was shown that the medical and nursing professions used different so-called 'knowledge claims', claims of possessing unique bodies of knowledge and/or expertise, when it came to prescribing. In its knowledge claims, the nursing profession strongly emphasised the routine everyday character of the knowledge used in the prescribing task by asserting that nurses were already prescribing medicines, albeit on an illegal basis. Their second claim ran that the introduction of nurse prescribing would do justice to nurses' skills and expertise. This is considered a strong claim in a quest for higher professional status.

Results also showed that the medical profession initially proclaimed that prescribing should be reserved for doctors as it is a task requiring medical knowledge. Gradually, however, the medical profession adjusted its claims and tried to reduce nurse prescribing to a task almost exclusively based on routine knowledge, in part by stating that nurses could prescribe in routine cases, which would generate little professional status. Moreover, the medical

profession increasingly emphasised that nurse prescribing should be based on protocols and guidelines that should be developed in part by doctors. Hence, instead of resisting the introduction of nurse prescribing, the medical profession aimed for adequate regulation and tried to preserve its intellectual jurisdiction over prescribing.

### ***Views and expectations regarding nurse prescribing***

**Chapter 7** is based on survey research among Dutch registered nurses (RNs), performed in 2006 and 2012. There were 386 and 644 respondents to the 2006 and 2012 surveys, respectively. It was found that RNs' support for nurse prescribing was stable but fairly cautious. The number of RNs feeling inadequately equipped to prescribe remained high (around 88% in both surveys), with insufficient knowledge to prescribe being the most important reason for feelings of inadequacy in both years. Moreover, two-thirds of the Dutch RNs in our survey who had already taken the prescribing module still felt they had insufficient knowledge to prescribe. Remarkably, the number of RNs who felt the support from their organisation to be insufficient for them to prescribe increased between 2006 and 2012 (from 26% to 40%). Overall, the prescribing views of Dutch RNs changed little between 2006 and 2012, despite several internal and external forces that might have changed them. This suggests that the debate within nursing about whether prescribing is something that nurses should be doing is still ongoing, which might affect the uptake of prescriptive authority.

**Chapter 8** reports on the findings of surveys among national samples of Dutch RNs, nurse specialists and physicians that explored their views on nurse prescribing. A total of 617 RNs, 375 nurse specialists and 265 physicians completed the questionnaire. Their views on nurse prescribing were assessed using fourteen items on a five-point Likert scale ranging from (1) "completely disagree" to (5) "completely agree". The results showed that all groups agreed that nurse prescribing benefits nurses' daily practice and the nursing profession. There were few concerns about the negative consequences for physicians' practice and the medical profession. It was only on issues surrounding the quality of care and patient safety that doctors showed more concerns, albeit still mild, than RNs and nurse specialists. These results suggest that RNs, nurse specialists and physicians generally held neutral to moderately positive views on nurse prescribing, which is beneficial for the implementation and potential success of nurse prescribing in practice. Yet

concerns about the consequences of nurse prescribing for the quality of care and patient safety remained a point for attention, especially among physicians.

### ***Division of jurisdictional control over prescribing in the workplace***

**Chapter 9** reports on the findings of a multiple-case study that examined how nurse prescribing takes shape in the Netherlands in everyday healthcare practice and how jurisdictional control over prescribing is divided between nurse specialists (with a Master's degree in Advanced Nursing Practice) and physicians in the workplace. This involved in-depth interviews with fifteen nurse specialists and fourteen medical specialists, non-participant observations of nurse specialists' consultations and document-analysis. Great diversity was found in the extent to which and the way in which nurse specialists' legal prescriptive authority has been implemented. There was considerable variability in the amount and range of medicines that nurse specialists were allowed to prescribe. Moreover, whilst prescribing, nurse specialists used a broad range of supporting documents, ranging from guidelines drafted by international professional associations to individual formularies developed by the nurse specialist herself/himself. Our study also found that the financing structure of nurse specialists' prescriptions was opaque and confusing to most nurse specialists and medical specialists. The manner in which the prescribing process took place was fairly similar for all the prescribing nurse specialists: they regularly consulted medical specialists about their prescribing decisions, almost always in an informal way. These findings suggest that there is considerable discrepancy between the division of jurisdictional control over prescribing at the legal level and at the workplace level. According to Dutch law, nurse specialists are allowed to prescribe any medicine within their specialism and competence. The additional rules and formal and informal agreements with medical specialists on the work floor severely limit this legal prescriptive authority. At the same time, it should be noted that prescribing is a relatively new task for Dutch nurse specialists. It is possible that the variability across hospitals and wards found shortly after the introduction of nurse specialists' prescriptive authority will diminish with time and a more 'common practice' may develop.

### ***General discussion***

Finally, **Chapter 10** provides a discussion of the main findings in this thesis as well as methodological considerations and implications for policy, practice

and future research. A plea is made for more policy attention to the financial aspects of nurse prescribing, as these often prove to be opaque and confusing. It is also recommended that policy expectations regarding the effects of nurse prescribing are made more realistic and adapted to the current situation on the work floor, in which nurse prescribing is progressing slowly and is being implemented in a more restricted way than the law permits. As considerable variation was found in the level and duration of nurse prescribing training and nurses were found to feel insecure about their prescribing knowledge, it is suggested that educational programmes pay more attention to how well their curricula fit nurses' needs when prescribing in everyday health care practice. Because the number of prescribing nurses is expected to grow over the next few years, it is also argued that the support and supervision of nurse prescribers by doctors should become more structured and formalised. In view of the low level of organisational readiness for nurse prescribing at present, checklists should be developed to facilitate the implementation of nurse prescribing. Finally, more cost-effectiveness studies and long-term studies are recommended as well to properly monitor the development and effects of nurse prescribing.

### ***Conclusion***

Nurses prescribe appropriately and in comparable ways to physicians. Yet the conditions under which nurses prescribe medicines vary considerably across countries, from countries where nurses prescribe independently to countries in which prescribing by nurses is only allowed under strict conditions and the supervision of physicians. This means that in some countries, such as the UK, nurses share (full) legal jurisdiction or control over prescribing with the medical profession, but in most other Western European and Anglo-Saxon countries, the legal jurisdiction over prescribing remains predominantly with the medical profession. In the Netherlands, categories of specialised registered nurses (with a Bachelor's degree) have limited legal prescribing rights, while nurse specialists (with a Master's degree in Advanced Nursing Practice) have quite extensive prescribing rights. Dutch nurse specialists can prescribe any medicine within their specialism and competence. However, there is great diversity in the extent to which and way in which nurse specialists' legal prescriptive authority has been implemented in everyday practice. Often, nurse specialists prescribe according to delimited protocols or in consultation with medical specialists. Hence, nurse specialists' legal authority over prescribing is much broader than their jurisdictional control over prescribing

on the work floor. As nurse prescribing in the Netherlands is still evolving, prescriptive authority on the work floor will presumably change and crystallise over the coming years. As it has been shown that nurse prescribing is safe and patients are generally satisfied with nurse prescribing, improvements in nurse prescribing education, financing and implementation in everyday practice can yield further improvements in the years to come.

**Samenvatting (summary in Dutch)**



Verpleegkundigen schrijven op een juiste manier medicijnen voor en op een vergelijkbare manier als artsen. Echter, de wettelijke, educatieve en organisatorische voorwaarden waaronder verpleegkundigen voorschrijven verschillen aanzienlijk tussen landen, variërend van landen waar verpleegkundigen geheel onafhankelijk medicijnen voorschrijven tot landen waar voorschrijven door verpleegkundigen enkel is toegestaan onder strenge voorwaarde en strikte supervisie door artsen. In Nederland hebben categorieën gespecialiseerde verpleegkundigen een beperkte voorschrijf-bevoegdheid terwijl verpleegkundig specialisten meer uitgebreide voorschrijfbevoegdheden hebben. Op de werkvloer bestaat er grote diversiteit in de mate van- en manier waarop de wettelijke voorschrijfbevoegdheid van verpleegkundig specialisten is geïmplementeerd. Als gevolg van de voorschrijfprotocollen en formele en informele afspraken die zijn gemaakt, is de jurisdictie die Nederlandse verpleegkundig specialisten op de werkvloer hebben aangaande het voorschrijven veel beperkter dan hun wettelijke voorschrijfbevoegdheid. Op de volgende pagina's wordt elk hoofdstuk van dit proefschrift kort samengevat.

### ***Introductie***

De algemene introductie (**Hoofdstuk 1**) beschrijft de achtergrond en het doel van dit proefschrift. De afgelopen decennia hebben de gelijktijdige processen van taakverschuiving en professionalisering van de verpleegkunde erin geresulteerd dat verpleegkundigen nieuwe posities en taken opnemen. Eén van de meest prominente ontwikkelingen in dit opzicht is de gedeeltelijke verschuiving van de taak van het voorschrijven van medicijnen van artsen naar verpleegkundigen. Het aantal landen waar verpleegkundigen voorschrijfbevoegdheid hebben is aanzienlijk gegroeid de afgelopen jaren. Met het oog op deze ontwikkeling zijn belangrijke vragen gesteld over of voorschrijven door verpleegkundigen veilig is en of het voorschrijven op klinisch verantwoorde wijze gebeurt.

Wanneer verpleegkundigen beginnen met het voorschrijven van medicijnen betreden ze een gebied dat traditiegetrouw uitsluitend aan de medische professie toebehoorde. Dit heeft gevolgen voor de relatie tussen de beide professies en voor de verdeling van jurisdictie of controle over de voorschrijftaak. Dit proefschrift benadert deze ontwikkelingen vanuit het perspectief van de sociologie van de professies, waarbij Andrew Abbott's (1988) werk aangaande jurisdictie het uitgangspunt vormt.

Abbott stelt dat professies bestaan in een wederzijds afhankelijk systeem waarbij zij met elkaar strijden om controle of jurisdictie over bepaalde taken, in dit geval het voorschrijven van medicijnen. Jurisdictie is belangrijk voor professies omdat het hun middel van professioneel levensonderhoud is. Jurisdictie geeft status en macht. Daarom strijden professies met elkaar om jurisdictie, zowel op wettelijk vlak als op de werkvloer, waarbij verschillende uitkomsten mogelijk zijn.

Dit proefschrift handelt over de effecten van voorschrijven door verpleegkundigen, de krachten die hebben geleid tot de introductie van voorschrijfbevoegdheid voor verpleegkundigen en de voorwaarden waaronder het voorschrijven door verpleegkundigen is gerealiseerd in West-Europese en Angelsaksische landen. Daarnaast worden de percepties en verwachtingen van Nederlandse verpleegkundige en medische stakeholders, verpleegkundig specialisten, verpleegkundigen en artsen aangaande de voorschrijfbevoegdheid voor verpleegkundigen beschreven evenals de manier waarop verpleegkundig specialisten in de dagelijkse praktijk voorschrijven.

### ***De effecten van voorschrijven door verpleegkundigen in vergelijking met voorschrijven door artsen***

**Hoofdstuk 2** presenteert een systematische internationale literatuurreview naar de effecten van voorschrijven door verpleegkundigen in vergelijking met voorschrijven door artsen op de hoeveelheid en het type voorgeschreven medicatie en op patiëntuitkomsten. Er werden vijfendertig relevante publicaties geïdentificeerd. De resultaten toonden aan dat verpleegkundigen op vergelijkbare wijze voorschrijven als artsen. Zij schrijven voor vergelijkbare aantallen patiënten voor en schrijven vergelijkbare types en doseringen medicijnen voor. Studies die de totale hoeveelheid voorgeschreven medicatie vergeleken tussen verpleegkundigen en artsen toonden gemengde resultaten. Klinische parameters waren hetzelfde of beter voor behandeling door verpleegkundigen in vergelijking met artsen, gepercipieerde kwaliteit van zorg was hetzelfde of beter en patiënten behandeld door verpleegkundigen waren net zo tevreden of meer tevreden dan patiënten behandeld door artsen. Conclusies moeten echter met de nodige voorzichtigheid benaderd worden gezien de methodologische zwakheden in deze tak van onderzoek. Dat gezegd hebbende geven de positieve bevindingen desalniettemin aan dat verpleegkundigen op vergelijkbare wijze voorschrijven als artsen. Zorgen aangaande de veiligheid en de klinische juistheid van het voorschrijven door

verpleegkundigen lijken dan ook onnodig en er is geen reden, op klinische grond, om verpleegkundigen niet te laten voorschrijven.

***Krachten die hebben geleid tot de introductie van voorschrijfbevoegdheid voor verpleegkundigen en voorwaarden voor voorschrijfbevoegdheid voor verpleegkundigen***

**Hoofdstuk 3** beschrijft een tweede systematische internationale review van de literatuur. Deze review brengt alle informatie samen over de krachten binnen en buiten de verpleegkundige professie die hebben geleid tot de introductie van voorschrijfbevoegdheid voor verpleegkundigen evenals de verschillende manieren waarop deze voorschrijfbevoegdheid is gerealiseerd in West-Europese en Angelsaksische landen. Zes literatuurdatabases en zeven websites werden uitgebreid doorzocht en dit leverde 124 relevante publicaties op. De resultaten toonden aan dat een diversiteit aan externe en interne krachten heeft geleid tot de introductie van voorschrijfbevoegdheid voor verpleegkundigen, waaronder het streven naar snellere en meer efficiënte toegang tot medicijnen en het voldoen aan de behoeften van patiënten in afgelegen gebieden die vaak lijden onder het tekort aan artsen. De review toonde ook aan dat de wettelijke, educatieve en organisatorische voorwaarden waaronder verpleegkundigen voorschrijven aanzienlijk variëren. In sommige landen delen verpleegkundigen jurisdictie over het voorschrijven met de medische professie, bijvoorbeeld in het Verenigd Koninkrijk, maar in de meeste landen blijft de jurisdictie voornamelijk in handen van de medische professie en schrijven verpleegkundigen in een ondergeschikte positie voor.

Om de voorwaarden waaronder voorschrijven door verpleegkundigen internationaal gezien is geïmplementeerd verder te onderzoeken, als ook de krachten die hebben geleid tot de introductie van voorschrijfbevoegdheid voor verpleegkundigen, werd een internationale survey uitgevoerd onder vertegenwoordigers van verpleegkundige en medische beroepsverenigingen en overheidsinstanties. Deze studie wordt beschreven in **Hoofdstuk 4**. Een totaal aantal van 39 respondenten uit tien landen vulde de vragenlijst in, waarbij medische beroepsverenigingen een lagere respons hadden. Respondenten van verpleegkundige en medische beroepsorganisaties noemden andere krachten als zijnde belangrijk voor de introductie van voorschrijfbevoegdheid voor verpleegkundigen. Respondenten van medische organisaties noemden bijna uitsluitend krachten die het voorschrijven door verpleegkundigen een noodzakelijkheid maakten, zoals personeelstekorten in

de gezondheidszorg, terwijl respondenten van verpleegkundige organisaties juist vaak minder urgente redenen aanhaalden, zoals de mogelijkheid om beter gebruik te maken van de vaardigheden van verpleegkundigen. Dit kan opgevat worden als professionele ‘probleem constructie’, vaak gebruikt voor het behouden of verkrijgen van jurisdictie over taken. Door bijvoorbeeld enkel de aandacht te vestigen op krachten die het voorschrijven door verpleegkundigen een onvermijdelijke noodzakelijkheid maken, kan de medische professie op strategische wijze getracht hebben zoveel mogelijk jurisdictionele controle te behouden. De studie toonde ook aan dat de voorwaarden waaronder verpleegkundigen medicijnen voorschrijven sterk uiteenlopen. Aanzienlijke variatie tussen landen werd bijvoorbeeld gevonden omtrent het niveau, de duur en de plaats van voorschrijftraining binnen de verschillende onderwijssystemen. Tot slot werd er veel onzekerheid gerapporteerd door respondenten over de financiële organisatie van het voorschrijven door verpleegkundigen. Dit is opvallend, gezien voorschrijfbevoegdheid voor verpleegkundigen vaak wordt geïntroduceerd om de kosten-efficiëntie binnen de gezondheidszorg te verhogen.

### ***Professionele kennisclaims***

Terwijl Hoofdstukken 1 tot en met 4 een internationale focus hebben, richten Hoofdstukken 5 tot en met 9 zich op het voorschrijven door verpleegkundigen in Nederland. **Hoofdstuk 5** beschrijft de resultaten van semigestructureerde interviews met dertien vertegenwoordigers van verpleegkundige en medische beroepsverenigingen en andere relevante partijen op het gebied van voorschrijven door verpleegkundigen in Nederland. Alle geïnterviewde partijen waren het erover eens dat het feit dat verpleegkundigen soms al medicijnen voorschreven zonder dat zij daarvoor wettelijk bevoegd waren, een situatie die bekend staat als ‘gedoogsituatie’, de belangrijkste reden vormde voor het starten van een introductieproces voor voorschrijfbevoegdheid voor verpleegkundigen. Dit weekt af van de resultaten die we internationaal vonden en is opvallend in het licht van ons theoretisch kader dat voorspelt dat professies de redenen voor de introductie van voorschrijfbevoegdheid voor verpleegkundigen zouden gebruiken en zodanig ‘construeren’ dat deze in hun voordeel uitwerken. Het feit dat alle betrokken partijen zo openlijk spraken over de gedoogsituatie is mogelijk een typisch Nederlands fenomeen en kan ook op andere beleidsterreinen gevonden worden.

De interviews toonden ook aan dat vertegenwoordigers van medische verenigingen ietwat minder positief tegenover de voorschrijfbevoegdheid voor verpleegkundigen stonden dan vertegenwoordigers van verpleegkundige verenigingen, en dat zij verschilden in hun kijk op de voorwaarden waaronder verpleegkundigen zouden moeten voorschrijven. Vertegenwoordigers van medische verenigingen gaven er bijvoorbeeld de voorkeur aan dat verpleegkundigen zouden voorschrijven in een verplicht samenwerkingsverband, met daarin op zijn minst één arts, terwijl vertegenwoordigers van verpleegkundige organisaties juist pleitten voor onafhankelijke voorschrijfrechten. Dit toont aan dat de medische professie zoveel mogelijk controle over het voorschrijven wilde behouden als mogelijk, terwijl de verpleegkundige professie probeerde iets van deze controle of jurisdictie over voorschrijven te verkrijgen.

We voltooiden onze semigestructureerde interviews met diepgaande documentanalyse. **Hoofdstuk 6** beschrijft de resultaten van de daaropvolgende thematische analyse. Hieruit bleek dat de medische en verpleegkundige professies verschillende zogenaamde ‘kennisclaims’ – claims unieke kennis en/of expertise te bezitten – gebruikten wanneer het om het voorschrijven ging. De verpleegkundige professie legde in haar kennisclaims sterk de nadruk op het routinematige en ‘elke dag’- aspect van de kennis die wordt gebruikt bij de taak van het voorschrijven door te stellen dat verpleegkundigen al medicijnen voorschreven, maar op niet-legale basis. Hun tweede claim luidde dat de introductie van voorschrijfbevoegdheid voor verpleegkundigen recht zou doen aan de vaardigheden en expertise waarover verpleegkundigen beschikken. Dit wordt gezien als een sterke claim in een zoektocht naar hogere professionele status.

De resultaten toonden ook aan dat de medische professie aanvankelijk stelde dat voorschrijven voorbehouden moest blijven aan artsen omdat het een taak is die om medische kennis vraagt. Geleidelijk echter paste de medische professie haar claims aan en probeerde ze het voorschrijven door verpleegkundigen te reduceren tot een taak die welhaast exclusief gebaseerd is op routinematige kennis, onder andere door te stellen dat verpleegkundigen enkel zouden kunnen voorschrijven voor routine patiënten, wat weinig professionele status zou opleveren. Daarnaast benadrukte de medische professie in toenemende mate dat voorschrijven door verpleegkundigen gebaseerd zou moeten zijn op protocollen en richtlijnen die deels door artsen ontwikkeld zouden moeten worden. In plaats van zich te verzetten tegen de

introdactie van voorschrijfbevoegdheid voor verpleegkundigen probeerde de medische professie deze introductie op een adequate manier te reguleren en probeerde zij haar intellectuele jurisdictie over voorschrijven te behouden.

### ***Percepties en verwachtingen ten aanzien van voorschrijven door verpleegkundigen***

**Hoofdstuk 7** is gebaseerd op surveyonderzoek dat in 2006 en in 2012 werd uitgevoerd onder Nederlandse verpleegkundigen. De surveys kenden 386 respectievelijk 644 respondenten. Het bleek dat de steun onder verpleegkundigen voor voorschrijven door verpleegkundigen stabiel doch tamelijk behoedzaam was. Het aantal verpleegkundigen dat zich onvoldoende toegerust voelde om voor te schrijven bleef hoog (rond de 88% in beide surveys), waarbij onvoldoende kennis om voor te schrijven in beide jaren de meest belangrijke reden hiervoor was. Daarnaast had twee derde van de Nederlandse verpleegkundigen in onze survey die de voorschrijfmodule reeds gevolgd hadden nog altijd het gevoel dat ze onvoldoende kennis hadden om voor te schrijven. Opvallend genoeg nam het aantal verpleegkundigen dat onvoldoende steun vanuit hun organisatie ondervond voor voorschrijven door verpleegkundigen toe tussen 2006 en 2012 (van 26% naar 40%). Over het algemeen echter veranderden de percepties van Nederlandse verpleegkundigen ten aanzien van voorschrijven door verpleegkundigen weinig tussen 2006 en 2012, ondanks verschillende interne en externe krachten die ze hadden kunnen veranderen. Dit suggereert dat de discussie binnen de verpleegkundige professie of voorschrijven tot het takenpakket van een verpleegkundige behoort nog altijd leeft, wat invloed kan hebben op het opnemen van de voorschrijftaak.

**Hoofdstuk 8** rapporteert de bevindingen van surveys onder nationale samples van Nederlandse verpleegkundigen, verpleegkundig specialisten en artsen die hun percepties ten aanzien van voorschrijven door verpleegkundigen onderzochten. Een totaal aantal van 617 verpleegkundigen, 375 verpleegkundig specialisten en 265 artsen voltooide de vragenlijst. Hun percepties ten aanzien van voorschrijven door verpleegkundigen werden gemeten aan de hand van een veertien items tellende vijf-punt Likert schaal die liep van (1) “compleet mee oneens” tot (5) “compleet mee eens”. De resultaten toonden dat alle groepen het erover eens waren dat voorschrijven door verpleegkundigen goed is voor de dagelijkse praktijk van verpleegkundigen en de verpleegkundige professie. Er waren weinig zorgen

over de negatieve consequenties voor de praktijk van artsen en de medische professie. Enkel daar waar het zaken betrof die te maken hebben met kwaliteit van zorg en patiëntveiligheid toonden artsen meer zorgen, hoewel nog altijd relatief weinig, dan verpleegkundigen en verpleegkundig specialisten. Deze resultaten suggereren dat verpleegkundigen, verpleegkundig specialisten en artsen over het algemeen neutrale tot matig positieve percepties hebben ten aanzien van voorschrijven door verpleegkundigen, wat goed is voor de implementatie en het potentiële succes van voorschrijven door verpleegkundigen in de praktijk. Tegelijkertijd bleven zorgen over de consequenties van voorschrijven door verpleegkundigen voor de kwaliteit van zorg en patiëntveiligheid een punt van aandacht, vooral onder artsen.

### ***Verdeling van jurisdictionele controle over voorschrijven op de werkvloer***

**Hoofdstuk 9** rapporteert de bevindingen van een meervoudig casestudie onderzoek dat onderzocht hoe voorschrijven door verpleegkundigen in Nederland in de alledaagse praktijk gestalte krijgt en hoe de jurisdictionele controle over voorschrijven op de werkvloer is verdeeld tussen verpleegkundig specialisten (met een masterdiploma Advanced Nursing Practice) en artsen. Het onderzoek bestond uit diepgaande interviews met vijftien verpleegkundig specialisten en veertien medisch specialisten, niet-participerende observaties van consulten van verpleegkundig specialisten en documentanalyse. Er werd grote variëteit gevonden in de mate waarin en de manier waarop de wettelijke voorschrijfbevoegdheid van verpleegkundig specialisten is geïmplementeerd. Er was aanzienlijke variatie in de hoeveelheid en range van medicijnen die verpleegkundig specialisten mochten voorschrijven. Daarnaast gebruikten verpleegkundig specialisten een brede waaier aan ondersteunende documenten terwijl zij voorschreven, uiteenlopend van richtlijnen opgesteld door internationale professionele verenigingen tot individuele formularia ontwikkeld door de verpleegkundig specialist zelf. Onze studie toonde ook aan dat de financieringsstructuur van voorschriften van verpleegkundig specialisten ondoorzichtig en verwarrend was voor de meeste verpleegkundig specialisten en medisch specialisten. De manier waarop het voorschrijfproces plaatsvond was grotendeels overeenkomend voor alle voorschrijvende verpleegkundig specialisten: ze hadden regelmatig overleg met medisch specialisten over hun voorschrijfbesluiten, bijna altijd op informele wijze. Deze bevindingen suggereren dat er een aanzienlijke discrepantie bestaat tussen de verdeling van jurisdictionele controle over voorschrijven op het

wettelijk niveau en op het niveau van de werkvloer. Volgens de Nederlandse wet is het verpleegkundig specialisten toegestaan elk medicijn voor te schrijven dat binnen hun specialisme en bekwaamheid valt. De additionele regels en formele en informele afspraken met medisch specialisten op de werkvloer beperken deze wettelijke voorschrijfbevoegdheid aanzienlijk. Tegelijkertijd moet hierbij opgemerkt worden dat voorschrijven een relatief nieuwe taak is voor Nederlandse verpleegkundig specialisten. Het is mogelijk dat de variabiliteit die zich op dit moment, kort na introductie van de voorschrijfbevoegdheid, voordoet tussen ziekenhuizen en ziekenhuisafdelingen met de tijd zal afnemen en dat zich een meer 'gemeenschappelijke praktijk' zal ontwikkelen.

### *Algemene discussie*

Tot slot biedt **Hoofdstuk 10** een discussie van de belangrijkste bevindingen van dit proefschrift, methodologische overwegingen en implicaties voor beleid, praktijk en toekomstig onderzoek. Er wordt gepleit voor meer beleidsaandacht voor de financiële aspecten van het voorschrijven door verpleegkundigen, gezien deze vaak ondoorzichtig en verwarrend zijn. Het wordt ook aanbevolen dat beleidsverwachtingen ten aanzien van de effecten van voorschrijven door verpleegkundigen meer realistisch gemaakt moeten worden en moeten worden aangepast aan de huidige situatie op de werkvloer, waarbij het voorschrijven door verpleegkundigen zich langzaam ontwikkelt en op een meer beperkte manier wordt geïntroduceerd dan de wet toestaat. Gezien de aanzienlijke variatie die werd gevonden in het niveau en de duur van de training voor voorschrijven door verpleegkundigen, en gezien verpleegkundigen aangaven zich onzeker te voelen over hun voorschrijfkennis, wordt geopperd dat trainingsprogramma's meer aandacht besteden aan hoe goed hun curricula aansluiten bij de behoeften van verpleegkundigen wanneer zij in de dagelijkse praktijk moeten voorschrijven. Omdat het aantal voorschrijvende verpleegkundigen vermoedelijk zal groeien de komende jaren wordt er ook voor gepleit de begeleiding en supervisie door artsen meer te structureren en formaliseren. Met het oog op de huidige beperkte organisatorische gereedheid voor het voorschrijven door verpleegkundigen moeten checklists ontwikkeld worden die de implementatie van de voorschrijfbevoegdheid kunnen faciliteren. Tot slot wordt aanbevolen meer onderzoek te verrichten naar de kosten-efficiëntie van het voorschrijven door verpleegkundigen en meer lange termijn studies uit te voeren om zo de

ontwikkeling en effecten van voorschrijven door verpleegkundigen goed te blijven monitoren.

### **Conclusie**

Verpleegkundigen schrijven op een juiste manier voor en op vergelijkbare wijze als artsen. De voorwaarden waaronder verpleegkundigen voorschrijven verschillen echter aanzienlijk tussen landen, uiteenlopend van landen waar verpleegkundigen onafhankelijk voorschrijven tot landen waar voorschrijven door verpleegkundigen enkel is toegestaan onder strikte voorwaarden en supervisie door artsen. Dit betekent dat in sommige landen, zoals bijvoorbeeld het Verenigd Koninkrijk, verpleegkundigen (volle) wettelijke jurisdictie over voorschrijven delen met de medische professie, maar dat in de meeste andere West-Europese en Angelsaksische landen de wettelijke jurisdictie over voorschrijven voornamelijk bij de medische professie blijft. In Nederland hebben categorieën gespecialiseerd verpleegkundigen (met een Bachelor degree) beperkte voorschrijfrechten terwijl verpleegkundig specialisten (met een Master degree Advanced Nursing Practice) vrij uitgebreide voorschrijfrechten hebben. Nederlandse verpleegkundig specialisten kunnen elk medicijn dat binnen hun specialisme en bekwaamheid valt voorschrijven. Er bestaat echter grote diversiteit in de mate waarin en manier waarop de wettelijke voorschrijfbevoegdheid van verpleegkundig specialisten is geïmplementeerd in de dagelijkse praktijk. Verpleegkundig specialisten schrijven vaak voor volgens afgebakende protocollen of in overleg met medisch specialisten. De wettelijke bevoegdheid die verpleegkundig specialisten over voorschrijven hebben is dus veel breder dan de jurisdictionele controle die zij op de werkvloer over voorschrijven hebben. Gezien voorschrijven door verpleegkundigen in Nederland nog steeds in ontwikkeling is, zal de voorschrijfbevoegdheid op de werkvloer vermoedelijk veranderen en zich de komende jaren uitkristalliseren. Gezien is aangetoond dat voorschrijven door verpleegkundigen veilig is en patiënten over het algemeen tevreden zijn met het voorschrijven door verpleegkundigen, kunnen verbeteringen in de educatie, financiering en implementatie van voorschrijven door verpleegkundigen in de dagelijkse praktijk verdere verbeteringen brengen in de komende jaren.



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Marieke Kroezen was born in Enschede, the Netherlands, on the 22<sup>nd</sup> of February 1987. After finishing high school in 2005, she began her academic studies at Utrecht University. As an undergraduate she combined a bachelor in Sociology with a minor in Development Studies, obtaining her BSc degree cum laude in 2008. She continued her education with a Masters in Medical Anthropology and Sociology at the University of Amsterdam. She obtained her MSc degree in 2009 after finishing a master thesis on the role of the dominant discourse on cardiovascular disease in peoples' personal cardiovascular disease risk discourses, based on fieldwork with the NHS in Nottingham (UK). That same year, she started working at the Netherlands Institute for Health Services Research (NIVEL). She initially worked on a study into the prevalence of Hepatitis C in Dutch prisons. In November 2009, she started working on the research described in this thesis.

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