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Best practice: Medical training from an international perspective

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Preface

This report provides the *Kassenärztliche Bundesvereinigung* (KBV) (national association of statutory health insurance physicians) in Germany with a study that seeks to help inform the further development of medical education and training in Germany. Specifically, we sought to understand how other countries are reforming their medical education and training system in order to better meet the needs of the changing healthcare environment and how they address shortages of doctors practising in primary or ambulatory care through reforming the education and training systems. We do so by means of an exploratory analysis of the experiences of three countries: England, France and the Netherlands, with Germany included for comparison. We describe the general context within which the medical education and training systems operate and provide an overview of the education and training pathways for general practice in each of the four countries. We place observed patterns into the overall governance of medical education and training, and analyse approaches to ensuring the provision and distribution of the primary care workforce nationally and regionally. We close with a presentation of options for medical education and training in Germany that arise from this study. This study will be of relevance for decisionmakers and practitioners concerned with ensuring a medical workforce that is prepared for the demands in a changing healthcare environment.

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Summary

There is increasing interest and activity, nationally and internationally, in the further development of the healthcare workforce. This is, in part, motivated by changing patterns of disease and illness, which, alongside technological advances and new approaches to practice, are altering the way healthcare is delivered. At the same time, a number of countries are also facing impending shortages of certain health professions suited to adequately meet these changing needs.

In Germany, there are concerns about a maldistribution of the medical workforce in particular, with an oversupply of physicians in and around metropolitan areas and shortages in less-densely populated rural and economic-structurally weak areas. Yet, while there has been a steady increase in the number of physicians practising in the statutory health insurance system, there are challenges in securing the provision of new physicians in certain specialties in primary care that are required to address the changing healthcare needs of the population, such as general practice. A number of reform efforts have been put in place that seek to address these challenges. These mostly target the distribution of qualified doctors. However, there is recognition that efforts to ensure an appropriate balance in the healthcare workforce need to extend into the way physicians are being trained.

In this report, we seek to help inform the further development of medical education and training for primary care in Germany. We explore approaches to medical education and training in a small number of high-income countries and how these seek to address shortages of doctors practising in primary or ambulatory care through reforming their education and training systems. We do so by means of an exploratory analysis of the experiences of three countries: England, France and the Netherlands, with Germany included for comparison. Data collection involved a review of the published and grey literature, using a structured template, complemented by information provided by key informants in the selected countries. We set out the general context within which the medical education and training systems in the four countries operate, and describe the education and training pathways for general practice for each. We highlight options for medical education and training in Germany that arise from this study by placing our observations in the context of ongoing reform activity.

Several components of the medical education and training system where Germany appears to diverge most from systems in other European countries are currently being considered as part of a number of proposals and recommendations in Germany.

We observe that the medical education and training system in Germany appears to diverge from systems in place in England, France and the Netherlands in three broad areas: (i) the framework for determining the number of students to be admitted to medical school and the number of places for and entry into

postgraduate medical training; (ii) the involvement of medical schools along the entire under- and postgraduate education and training pathway; and (iii) the financing of postgraduate training in ambulatory care settings. Observed differences do not necessarily imply that one approach is superior to another; indeed such a judgement would not be possible given the lack of empirical evidence on the relative advantages and disadvantages of different medical education and training systems and associated impacts on the quality of care and population health outcomes. Importantly, many of the areas which we identified to be different are already being considered by a number of proposals and recommendations put forward by various stakeholders in Germany and we discuss these in turn.

Germany appears to be the only among the four countries studied where the annual number of students to be admitted to medical school is determined at the state rather than the national level, and without input from the health service.

In Germany, higher education is the responsibility of the 16 states, as set out in the constitution, while responsibility for the healthcare system is shared among the federal government, the corporatist actors and the states. The respective state ministries of science and technology or of education define the number of medical students, and they do so in consultation with the medical schools. Views on whether the process of admission to medical school in Germany should be amended vary among stakeholders, including those interviewed for this study. The current debate focuses mainly on criteria for admission rather than the annual number of students to be admitted, with some stakeholders highlighting the possibility of placing more weight on aptitude and commitment to (future) practice in primary care among students applying to medical school, while others point to the lack of evidence about the degree to which different approaches to student selection impact on subsequent career choice in primary or specialist care.

England, France and the Netherlands each operate a national-level planning process that regulates entry into individual medical specialties.

In France and the Netherlands, national planning regulating entry into individual medical specialties is undertaken by the respective ministries of health, informed by regional (France) or national workforce planning (the Netherlands), while in England, the number of places is determined at the regional level, but is based on national workforce planning by the Department of Health. In all three countries, trainee selection is also coordinated nationally, and entry into (any) specialist training is on a competitive basis. Conversely, in Germany, there is no planning for the number of specialist training places; regarding specialist training in general practice, a national agreement among the key actors foresees financial support for a minimum of 5,000 training places annually. Specialist training is not coordinated at the national level. Those pursuing specialisation have to organise the different rotations required for a given specialist qualification themselves, although postgraduate training networks are increasingly being established in general practice to facilitate rotation.

A national strategy or coordinating mechanism that defines the number of doctors entering training programmes for a given medical specialty may be an effective way to plan and regulate the entry of young doctors into different specialties. Based on medium- to long-term projections, such an approach would allow for the balancing of the number of required specialists in different medical disciplines and could reduce the impact of projected shortfalls in specific areas. This was demonstrated by the experience of

health workforce planning in the Netherlands, which is seen to have contributed to mitigating an estimated shortage of general practitioners over a period of 10 years.

In Germany, a national strategy that explicitly plans for the number of doctors entering specialty training as a means to direct the future balance of specialties in the medical workforce does not appear to be discussed explicitly. However, commentators have highlighted a need for the better coordination of postgraduate training in general practice in particular. A number of activities are underway to strengthen coordination, with recommended approaches foreseeing the creation of a nationally coordinated approach with guaranteed posts for each trainee in general practice over the entire training period. Such an approach, it is argued, would allow for a more predictable pathway in general practice training and enhance its status as a career option.

Medical schools in England, France and the Netherlands are involved in the delivery of the curriculum of postgraduate medical training.

Postgraduate medical training in Germany consists almost entirely of training on the job, with no formal taught course element. This is in contrast to the three comparator countries, where medical schools are involved (to different degrees) in the delivery of the curriculum of postgraduate medical training. Furthermore, England and the Netherlands have also set up 'training institutes' that are linked to medical schools ('foundation schools' in England; general practitioner training institutes in the Netherlands). It is difficult, on the basis of the available evidence, to be certain whether the capabilities and competencies of physicians undergoing specialist training with medical school involvement are different from those doing so without medical school involvement, or whether these different training systems result in differences in the quality of care provided. However, medical graduates pursuing general practitioner (GP) specialty training in Germany have voiced concern about the lack of regular advanced training courses or seminars during training, which, they argue, are common for those training in hospital settings, and which would help ensure a minimum standardised knowledge base among GPs in training. Regional 'competence centres' that are currently established by a small number of medical schools in Germany seek to provide training and mentorship opportunities for GP trainees and their trainers and to coordinate the training of GPs. It has been recommended that such centres be further strengthened at the regional level. Such approaches, alongside coordinating points that have been established at the state chambers of physicians, might address perceived concerns among GP trainees about professional isolation and might also address requests for a structured mentoring programme.

England, France and the Netherlands have set aside a specific budget to finance postgraduate training in general practice.

We found that all three comparator countries have set aside a specific budget to pay or finance trainees; in the Netherlands a dedicated organisation, the foundation for vocational training of GPs (Stichting Beroeps Opleiding Huisartsen, SBOH)) acts as single employer of all GP trainees. In addition, all three countries have mechanisms in place that, at the national level, ensure reimbursement of trainers (both at the undergraduate and the postgraduate level). In Germany, there is commitment to the support of specialist training in general practice, as set out in legislation and subsequent agreements among the key stakeholders, but there are challenges in the implementation of the relevant stipulations in practice. This

can lead to interruptions in training and to phases of unemployment, which in turn prolongs the time required to complete the training. The advisory council on the assessment of developments in the healthcare system (Sachverständigenrat zur Begutachtung der Entwicklung im Gesundheitswesen, SVR) recommended introducing a nationally coordinated financing mechanism that includes guaranteed GP training posts throughout the entire training period, as noted above. It proposed different ways in which such a mechanism could be funded, but stressed that it should be directed through an organisation – or, similar to the Dutch model, a dedicated foundation at the national level – and be independently financed through tax income rather than linked to the statutory health insurance system.

A multifaceted approach is needed to strengthen the status of general practice and primary care as a career choice among medical graduates and to thereby secure adequate supply in the light of changing population healthcare needs.

At the core of many proposals put forward by different stakeholders to reform the medical education and training system in Germany is a strengthening of general practice and of the general ambulatory care sector more broadly, in response to the changing burden of disease and the health needs generated by these changes. In addition to approaches listed above, recommendations include measures within undergraduate education and training seeking to enhance the recognition of general practice as a core subject in medical practice. Examples of such measures are the introduction of a mandatory placement in general practice in the final practical year or the introduction of academic departments or institutes of general practice at all medical schools. These measures regain urgency in the light of the most recent national survey of medical students in Germany of 2014, which illustrates that general practice as a career pathway has a relatively low status among medical students and practising doctors alike. Given that medical students' most trusted source of information about medical career is practising doctors, there is a need for a multifaceted approach in order to create an environment that is conducive to medical students gaining a positive experience of general practice during medical school early on that will likely influence their future career choice.

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1. Introduction

1.1. Background

The rising number of people with multiple chronic conditions, ageing populations, and increasing expectations, alongside technological advances and new approaches to practice and funding, are all altering the way healthcare is delivered by providers and accessed by service users.[1] Changing patterns of disease and illness, in combination with increasing frailty at old age, in particular, require that healthcare services transform from the traditional model of care, with its focus on acute, episodic illness, towards one that is centred on the needs of patients and grounded in partnerships between patients and providers working to optimise outcomes.[2 3]

The growing recognition of this need is causing many countries to explore new strategies and approaches to healthcare delivery.[4 5] This has significant implications for the health workforce. It requires, for example, adjustments to its composition and a new set of technical skills and core generic competencies that workers will have to be able to master while retaining existing competencies to sustain the capacity to deliver current services.[6-8] Accordingly, there is increasing interest and activity, nationally and internationally, in the further development of the healthcare workforce to better meet the present and future needs of a changing healthcare environment. For instance, over the past decade, the OECD, in its Human Resources for Health Care project (2002–2006); the World Health Organization (WHO); and the European Commission have undertaken or funded work on health workforce development, frequently, although not exclusively, with a focus on supply and demand issues, as well as the division of labour or skill mix.[9-12]

Education and training are seen as core components of workforce development to secure (future) supply. Yet, efforts to systematically assess the quality and outcomes of the delivery of education and training of the healthcare workforce and approaches to reforming the education and training systems to better address the changing healthcare context appear to be rarely addressed explicitly.[13] For example, the European Commission's 2008 *Green paper on the European workforce for health* and subsequent reports emphasise the key role of workforce training.[14 15] However, training is conceptualised mainly in relation to securing supply and the need for continuing professional development.[16] There are, however, plans by the European Commission and the OECD to assess the structure and training capacities in the EU.[13]

In 2010, the Global Independent Commission for Health Education in the 21st Century launched a major report calling for the transformation of health professional education to better meet the changing requirements facing health systems worldwide.[17] It envisaged a 'third generation of educational reform'

that, following science-based education (first generation) and problem-based instruction (second generation), is systems-based to improve the performance of health systems. It proposed that educational reform be guided by two main outcomes, referred to as 'transformative learning' and 'interdependence in education' in order to ensure the supply of an educated workforce that meets the demands of a changing health system.

These proposed transformations can be set against increasing concerns, in many OECD countries, about potential shortages in certain health professions, medical specialisations or geographic locations. One major challenge relates to an ageing workforce. For example, 3.2 per cent of all European doctors are expected to retire annually by 2020; yet, this loss is unlikely to be offset by a sufficient number of new healthcare professionals.[15]

The medical workforce in Germany

Germany is facing a number of challenges in the provision of healthcare staff. Among these there are two core issues of concern. One relates to the oversupply of physicians in and around metropolitan areas and shortages in less-densely populated rural and economic-structurally weak areas, in particular in the eastern part of the country.[18] A second challenge concerns the provision of new physicians in certain specialties, such as general practice. While there has been a steady increase in the number of physicians practising in the statutory system over the past decade, observers have noted a structural shift in the composition of the physician workforce, with a fall in the number of general practitioners (GPs), or family physicians, and an increase in the number of specialist physicians.[19] Similar to other high-income countries, a particular challenge arises from an ageing healthcare workforce. In 2012, about 25 per cent of physicians working in the statutory system were 60 years and older; this proportion was higher among family physicians, at 31 per cent.[20]

Replacing doctors in underserved areas is becoming increasingly challenging, and affects the GP workforce in particular. The number of medical students has remained fairly stable over the past 10 years,[21] while the proportion of new certifications for specialist in general practice (*Allgemeinmedizin,* literally 'general medicine', also referred to as family medicine; see also Section 1.3.3) has gradually declined; during the past few years the proportion has been around 10 per cent.[22] There is also a strong preference for working in urban areas, with one recent survey of medical students, undertaken in 2014, reporting that over half of respondents did not wish to work in small or rural communities.[23] Against this background there are concerns about how to maintain adequate coverage of and access to medical care in less populated and underserved areas.

In order to address these challenges, the 2012 healthcare reform has put in place a number of measures seeking to encourage doctors to set up practice in areas where there is a shortage in the ambulatory care sector. These include financial incentives, increased opportunities to establish a second practice and to delegate medical tasks, and initiatives by the regional physicians' associations to support the establishment of a practice, among other measures.[24]

At the same time, there is recognition that efforts to ensure an appropriate balance in the healthcare workforce need to extend into the way physicians are being trained. Current approaches to training doctors may not be suitable to prepare the future medical workforce for the challenges ahead. For

example, the training of health workers is still mostly confined to institutional settings, with skills acquired being most suited to inpatient care. But with the changing healthcare needs arising from multiple complex conditions, coupled with advanced technologies that have made it possible to provide many services closer to the patient and that have prompted shifts from inpatient to the ambulatory care settings, the education and training of health workers needs to extend beyond teaching hospitals to enable trainees to acquire a broader understanding of healthcare issues within the community setting and prepare them to work in a variety of settings.[1] At an international level, the aforementioned Global Independent Commission for Health Education in the 21st Century noted how educational systems have failed to keep pace with these challenges; it attributed this mainly to 'fragmented, outdated, and static curricula' that result in 'ill-equipped graduates'.[17] Concerns centre around a mismatch of competencies to patient and population needs, a focus on narrow technical aspects rather than broader contextual understanding, a reliance on an episodic rather than a continuous model of care, and an emphasis on specialisation in medicine in the university and hospital setting rather than primary care, among other things.

1.2. Aims of the study

This report was commissioned to help inform the further development of medical education and training in Germany. Specifically, we sought to understand

(i) how other countries are reforming their medical education and training systems in order to better meet the needs of the changing healthcare environment and the approaches that are being used; and

(ii) how other countries address shortages of doctors practising in primary or ambulatory care through reforming the education and training systems.

In addressing these two overarching questions, there was a particular interest in identifying best practices and potentially transferable lessons for Germany. In order to address these overarching questions, we specifically aimed to:

- Describe the key components of education and training, including postgraduate training of medical doctors in three countries: France, the Netherlands and the UK (England), with Germany included for comparison, and with a particular focus on the 'typical' education and training pathways for general practice.
- Assess the core functions applying to medical education systems in the countries under review and delineating stewardship, governance, financing, resource generation, and provision and the roles and responsibilities of key stakeholders involved in the design and delivery of medical education and training.
- Identify strategies and approaches that are being employed in different medical education and training systems to ensure appropriate provision of primary care that is accessible and of high quality in sparsely populated or economic-structurally weak regions, from student recruitment through to continuing professional education.
- Assess the transferability of promising approaches ('best practices') to the German context.

1.3. Methods

1.3.1. Selection of countries

We reviewed four countries: England, France, Germany and the Netherlands. This selection was based on a long-list of countries identified by the commissioner of this work, the national association of statutory health insurance physicians (Kassenärztliche Bundesvereinigung, KBV), as of potential relevance for the German context, and which included England, the Netherlands, Norway, Sweden, Switzerland and the United States. Country selection was further informed by a preliminary review of the available literature and our earlier work, which explored outcome metrics to measure quality in education and training of healthcare professionals, and which added Australia, Belgium and New Zealand to the potential range of countries to be considered.[13] The timeframe available for this study did not permit an in-depth review of all the countries considered as potentially relevant; the selection therefore had to be narrowed to a smaller sub-sample, identified in consultation with the KBV was driven by a focus on European countries that are typically considered for comparison in the German context. Where the evidence review (see below) identified specific issues from countries other than those included for in-depth review, and that were considered of potential relevance to the topics discussed in the report, we explored these further and included them in the overview section of this report.

1.3.2. Data collection

Evidence review

Data collection involved, first, a review of the published and grey literature as identified from the bibliographic database PubMed; the World Wide Web, using the Google Scholar search engine; and from governmental and non-governmental agencies and organisations with a remit in the area of medical education and training in the countries under review. The PubMed searches used combinations of the following terms ('/' indicating 'or'): 'general practice/general medicine/family practice/family medicine/GP'; 'medical education/medical training/medical school/training' and name of country.

The review sought to identify information on

(i) The general system context within which healthcare is being organised, governed and delivered, with a focus on primary or ambulatory care, and general practice, including composition, capacity, and distribution of the primary or ambulatory care workforce;

(ii) Medical education and training, including:
   a. Governance of medical education and training, including roles and responsibilities along the education and training pathways;
   b. The 'typical' education and training pathway for medical students entering general practice; and
   c. Trends and developments in medical education and training, including innovative practices around student recruitment, curriculum development and student assessment, stewardship of medical education and training; and

(iii) Stakeholder views on the current system; motivations, facilitators and barriers for medical students and graduates to move into general practice and on motivations for and barriers to setting up practice in underserved areas.

Informed by these themes, we developed a template for data collection, which then formed the basis for the preparation of detailed country reviews. We included documents written in Dutch, English, French and German. The data collection template is presented in Appendix A.

Key informant interviews

Second, the report was informed by key informant interviews to enhance our understanding of the more salient issues pertaining to the context and processes within which medical education and training is organised, governed and delivered. Key informant interviews can provide important insights into issues that are poorly documented or that require a level of expertise and insight that is not easily accessible through information extracted from the published or grey literature, such as ongoing policy development and reform efforts. They further informed our understanding of the potential transferability of models and approaches to Germany.

Study participants were identified through a combination of purposive and 'snowball' strategies using the published literature, official websites, the authors' professional networks and recommendations from other study participants. We focused on a range of stakeholders involved in the organisation, governance or delivery of medical education and training, considering representatives from physicians' associations, medical schools, regulators and research organisations.

Potential study participants were invited by means of an email, which included an explanation of the background to the study. Interviews explored broad themes around medical education and training, including stakeholder involvement and roles along the education and training pathways, from student recruitment through to final assessment and registration of newly qualified physicians; measures in place to ensure the quality of education and training along the pathway; coordination of and collaboration between the educational and health systems; ongoing or planned efforts to change or reform medical education and training, as well as other issues that the informants raised. The interview topic guide, which was shared with participants before the interview, is presented in Appendix B.

Interviews followed ethical principles of conducting research involving human subjects. This means key informants were approached in their professional role only, and no sensitive personal information was collected. Data protection measures were put in place to maintain confidentiality of interview participants of whom written consent for participation in the interview was sought. The majority of interviews were carried out by telephone, generally on a one-to-one basis, with the exception of one interview, which was carried out with two representatives of the same organisation (France). Interviews were conducted in the English (England, the Netherlands), French (France), or German language (4 out of 6). They lasted 45 to 60 minutes, were audio-recorded following consent, translated into English where necessary, and transcribed verbatim.

Analysis of the interviews was informed by the key themes guiding the interviews, as described above, while also seeking to identify additional emerging themes.

We interviewed a total of 21 key informants, representing different stakeholders who are involved in, or are close observers of, the organisation, governance or delivery of medical education and training (England: 4, France: 6, Germany: 6, the Netherlands: 5). Appendix C provides an overview of roles and affiliations of key informants who participated in the study; one participant did not give permission for their affiliation to be listed.

1.3.3. Terminology

One challenge in any international system comparison is the variation that exists in the definition and interpretation of seemingly similar concepts and terminologies. For example, primary care has been described as care that is directly accessible to patients, with a generalist character that is provided within the community it serves and that is oriented towards the individual in their social context.[25] Boundaries are not clear-cut, however, and the term 'primary care' is often used interchangeably with the term 'general practice'.[26] Yet, these concepts are not necessarily equivalent, because functions and characteristics of what is being defined as general practice differ among countries. Furthermore, in some countries, the notion of primary care as care that is of a generalist nature is difficult to conceptualise. For example, in Germany, in 2013, just under 41 per cent of office-based doctors (physicians in private practice) worked as family physicians (*Hausarzt*). Of these, about 65 per cent held a specialist qualification in general (or family) medicine, while just under 25 per cent were specialists in internal medicine. The remainder comprised physicians without any specialist qualification who practise family medicine.[27] Here, the concept of primary care as such is not commonly used; instead, terminology refers to 'ambulatory care', which is distinguished into *hausärztliche Versorgung* (family medicine or general practice) and *fachärztliche Versorgung* (specialist practice). A similar system is principally in place in France. However, in France, with the formal recognition of general practice as a specialist qualification in 2004 and the formal recognition of primary care as per 2009 legislation (see Chapter 4), the term 'primary care' is now used more widely.

It is against this background that the terminology around 'general practice', which is the focus of this report, has to be interpreted. In Germany, the literal translation of 'general medicine' (*Allgemeinmedizin*) refers to a specialisation that is, in broad terms, equivalent to that of general practice, which is commonly used in England (or the UK more broadly) and in the Netherlands (Table 1).

Table 1 Definitions of 'general practice' in England, France, Germany and the Netherlands

Country	Definition
England	The definition of general practice principally follows that set out by WONCA Europe (2005)[28]
France	General practice is a recognised medical specialty (from 2004)[29] General practice competencies include clinical knowledge and communication and managerial skills. The patient's medical record is considered as the main tool for the delivery of care and the management of the care pathway. The complexity of the scope of general medicine and the need to develop a global approach, from prevention to rehabilitation, are acknowledged for the delivery of patient-centred care that not only takes into account but also coordinates local community healthcare resources. (Adapted from [30])
Germany	General practice encompasses the provision of long-standing family medical care for people of all

Country	Definition
	ages in the event of any kind of health disorder, taking into account the biological, psychological and social aspects of their health-related complaints, problems or risks, and the medical competence to decide on the consultation of other physicians and health professions. It encompasses the patient-centred integration of medical, psychological and social support in case of illness. This also includes the care for acute and chronic conditions, prevention and health advice, early detection of diseases, initiation of rehabilitation measures, cooperation with all people and institutions of relevance to the care of the patient, support of community-based health promotion activities, and the pooling of all medically important data of the patient. (Adapted from [31])
Netherlands	General practice medical care is generalist care that is patient-oriented and continuous. This means that the GP possesses the necessary knowledge and skills to adequately assess all possible complaints, problems and questions and to take action, give patients advice or refer them to another physician, while taking account of natural disease progression. The GP takes into account the patient's individual characteristics and the patient's context, which the GP integrates with physical, mental and social aspects that can influence the patient's health and illness. The GP ensures continuity of care during periods of illness and during the patient's general course of life through working together with other healthcare providers. (Adapted from [32])

Note: WONCA - World Organisation of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians

For the purposes of this document we use the term 'general practice' throughout, recognising the alternate use of the term 'family medicine' in different system contexts (including in the Netherlands). We further use the terms 'family physician', 'general practitioner' and 'primary care doctor' interchangeably, while noting that these are not identical.

We should further note that the term 'doctor' is not necessarily equivalent across countries either. Thus, in some countries, such as in the Netherlands, the degree of Doctor in Medicine (MD) is a professional title, whereas in other countries, the MD constitutes a research degree (e.g. UK) or academic degree (e.g. Germany). In Germany, the professional title of graduates who have completed undergraduate medical training and have received the licence to practice is that of physician; around half of medical graduates pursue the academic Doctor in Medicine degree (Dr med). While recognising these distinctions, throughout this report we use the terms 'physician' and 'doctor' interchangeably.

1.3.4. About this report

This document is structured as follows: Chapter 2 reports on the main observations on medical education and training for general practice in four countries, using a comparative approach. Chapters 3 to 6 are individual reports of each of the four countries reviewed here. These reports follow a common structure: setting the health system in context and outlining characteristics of general practice, followed by a detailed description of the medical education and training pathways, with a focus on general practice training. They further report on financing, quality assurance and general governance arrangements. Each concludes with a brief summary of main stakeholder views on the system that is currently in place.

2. Overview of findings

This chapter provides a summary overview of the key features of education and training of medical doctors providing primary or ambulatory care in England, France, and the Netherlands, with Germany included for comparison. It draws on the detailed descriptions of each of the countries as presented in Chapters 3 to 6.

We begin by setting out the general context within which the medical education and training systems in the four countries operate, and describe some of the main characteristics of the primary or ambulatory care systems. We then describe what can be broadly referred to as generalised education and training pathways for general practice in each of the four countries, recognising that specific career pathways will vary within and across countries. We seek to place observed patterns into the overall governance of medical education and training, outlining mechanisms in place for financing and quality assurance along the education and training pathways. This is followed by an analysis of approaches used to ensure the provision and distribution of the primary care workforce, nationally and regionally. We close with a discussion of options for medical education and training in Germany that arise from this study.

2.1. Health system context

Of the four countries included in this review, only England operates a largely tax-funded system, with healthcare mainly organised and delivered through the National Health Service (NHS). France, Germany and the Netherlands all operate statutory health insurance (SHI) systems; they also spend more on healthcare, measured as per capita expenditure and as percentage of national income (gross domestic product, GDP) compared with England (Table 2).

The governance of publicly funded healthcare also varies, with healthcare governance in Germany and the Netherlands shared by central government and corporatist actors, and, in the case of in Germany, with the states), while England and France have traditionally operated more centralised systems. However, the latter have seen the gradual decentralisation of (selected) governance functions to, for example, regional agencies, such as the regional health agencies in France, or to newly established bodies, such as NHS England, which is an executive agency that is independent from the Department of Health and has the central role to oversee the delivery of NHS services.[33]

Table 2 Overview of health system financing and governance in four countries, 2012

Main source of funding (% total health expenditure)	Other sources (% total health expenditure)	Spending as % GDP	Per capita spending (US$ PPP)	Governance of the publicly funded system
England				
General taxation: 82.5% (UK)	OOP: 9.9% VHI: 1.1% (UK)	9.4% (UK)	3,495 (UK)	Central level by government and agencies at arm's length from government; local organisations organise healthcare delivery
France				
Statutory health insurance: 71.0%	Taxation: 5.9% OOP: 7.4% VHI: 14%	11.7%	4,260	Traditionally concentrated at the national level, with gradual decentralisation of (selected) governance functions to regional agencies
Germany				
Statutory health insurance: 67.6%	Taxation: 8.7% OOP: 12% VHI: 9.5%	11.3%	4,617	Shared by central government, 16 state governments and corporatist actors; responsibility for hospital sector mainly with the 16 states
Netherlands				
Statutory health insurance: 72.6%	Taxation: 10.7% OOP: 5.6% VHI: 5.2%	12.4%	5,484	Healthcare system governance is shared by the government and the corporatist (self-governance) sector

Source: World Health Organization (2014)[34]
Notes: GDP – gross domestic product; PPP – purchasing power parity; OOP – out-of-pocket payment; VHI – voluntary health insurance

In all four countries, the general practitioner (or family physician) typically serves as the first point of contact for non-urgent care, but countries differ in the way in which patients enter the system of primary care. For example, in England, patients have to register with a general practitioner in the area in which they live. The Netherlands, which, in 2006, moved to a mandatory, regulated private insurance system, also requires registration with a general practitioner, although patients can, in principle, choose any practitioner. Both countries also operate a strict gatekeeping system, in which the GP controls access to specialist care in non-urgent cases (Table 3).

Conversely, in Germany, patients can see any general practitioner; they also have direct access to medical specialists outside hospital. Since 2004, statutory social health insurance funds are required to offer their members GP-centred care in which patients voluntarily sign up with a family doctor as the first point of contact for a period of at least one year. A similar system is in place in France, where, since 2005, residents are encouraged to sign up with a 'preferred doctor' (mainly general practitioners); this voluntary gatekeeping system incurs higher co-payments for those patients who choose to directly access a specialist, without a referral from their preferred doctor. In France, uptake of the scheme has been high, with about 85 per cent of patients having signed up with a preferred doctor by the end of 2008.[35] In contrast,

uptake has remained low in Germany, at only about 20 per cent of those covered by SHI, since the introduction of the voluntary gatekeeping scheme.[36]

Payment of GPs typically involves a combination of a form of capitation and fee-for-service, with the exception of France, where payment is based on fee-for-service. In England and France, GP reimbursement also includes a pay-for-performance element.

Table 3 Key features of service provision and payment in primary or ambulatory care in four countries

Provision of primary/ ambulatory care	Choice of provider in primary/ ambulatory care	GP gatekeeping	Payment of general practitioners
England			
Primary care teams in GP practices or health centres	Within specified, small area only; registration with GP required	Yes; access to specialist care upon referral only	Combination of capitation and fee-for service based on centrally negotiated General Medical Services (GMS) contract between the General Practitioners Committee of the British Medical Association and NHS Employers; voluntary pay-for-performance element (Quality and Outcomes Framework)
France			
Office-based primary and specialist care physicians	Yes	Voluntary ('preferred doctor')	Fee-for-service; nationally set fee based on agreements between professional organisations and SHI administration; pay-for-performance element from 2009 based on individual contracts between GP and SHI
Germany			
Office-based primary and specialist care physicians	Yes	Voluntary ('GP contracts')	Combination of capitation and fee-for service based on centrally negotiated 'uniform value scale' (EBM), negotiated between federal association of SHI physicians and national association of SHI funds
Netherlands			
General practitioners in group practices	Yes; registration with GP required	Yes; access to specialist care upon referral only	Combination of capitation and fee-for-service; maximum remuneration fees for GPs negotiated between National Association of GPs, Health Insurers Netherlands and Ministry of Health, Welfare and Sport

Source: Authors' compilation
Note: SHI – statutory health insurance

Exploring selected characteristics of the GP workforce, France seems to stand out with a high number of GPs, both in terms of its total number and in relation to the resident population (Table 4). Thus, in 2013, the (average) number of GPs per 100,000 population in France was about twice that seen in England, Germany or the Netherlands. In England and Germany, in 2012, the regional distribution of GPs varied by a factor of two, while the Netherlands showed very little regional variation in GP density.

Accordingly, the Netherlands currently records few concerns about the availability of GPs across the country, and accessibility is generally considered high, although there are pockets of demand–supply

mismatch in selected urban areas.[37] Conversely, in both France and Germany there are concerns about a maldistribution of GPs, with identified underserved areas, typically in less-densely populated rural and economic-structurally weak regions.[18 38] In England, although there is evidence of regional variation in the distribution of GPs, this seems to favour more rural areas, while some urban areas have a lower GP density.[39]

It is notable that in England the majority of GPs work in practices of four and more GPs, with only a small proportion (10 per cent) operating solo practices, while the converse is the case in Germany, and to some extent in the Netherlands also. Figures for France are difficult to compare, as sharing of the same premises will be considered as group practice even though the doctors involved retain their individual patient lists and do not share this list among doctors sharing their premises.

An outstanding feature is the age of GPs, in particular France and Germany, where, in 2012–2013 about two-thirds were aged 50 years and over. These proportions were considerably lower in England and the Netherlands.

Table 4 GP practices and workforce: Selected characteristics in four countries

Number of practising GPs	Number of GP practices	GP density/ 100,000	% of GPs aged 50 years and over	Distribution of GPs
England				
35,527 (2012) 2/3 work as partner; remainder are salaried employees	8,090 practices (2012) 57% have 4+ GPs; 10% are solo practices	From 49.8 to 88.7 (2012, FTE)	39.9% (2012)	GP density tends to be higher in rural areas, while in more urban areas, particularly in the Midlands and the North, it tends to be lower
France				
91,539 (2013) About 60% are self-employed	35,248 practices (2011) 54% of GPs work in group practices (2009)	From 115 to 162 (2013)	65% (2013)	Medically underserved areas defined as very low GP density/high GP activity; affecting 4% of the population (2.6m) and 3% of GPs, mostly in rural areas
Germany*				
40,722 (2013) About 7% are salaried employees	~38% work in group or job-sharing practices (2013)	From 47 to 94 across districts (2012)	69% (2013)	Mismatch of supply, with shortages in less densely populated rural and economic-structurally weak areas, in particular in the eastern part

Netherlands				
11,235 (2011) 78% are self-employed, 11% employed	4,917 practices (2012) 18% have 3+ GPs; 47% are solo practices	From 40.1 to 44.1 (2012)	48.9% (2012)	Distribution of GPs relatively even across regions; accessibility generally high, with pockets of demand–supply mismatch in selected urban areas

Note: * Physicians with specialist qualification in general practice and non-specialised physicians only.
Sources: Baudier et al. (2010)[40]; Observatoire des Métiers dans les Professions Libérales (2011)[41]; Kassenärztliche Bundesvereinigung (2014)[27]; NIVEL (2012)[42]; Health & Social Care Information Centre (2013)[39]; Lebreton-Lerouvillois (2013)[38]; van Hassel and Kenens (2013)[43]; CBS (2014)[44]; versorgungsatlas.de (2014).[45]

With the possible exception of the Netherlands, all countries have or will be witnessing a reduction in the GP workforce. For example, in England, although the GP workforce steadily increased between 2002 and 2012, by almost one-quarter, growth has slowed more recently when compared with the growth of consultants (specialist doctors), whose number has continued to rise, by more than 50 per cent, during the same period.[39] There is an expectation by the English Department of Health (the health ministry) that 50 per cent of medical students will need to become GPs in order to compensate for projected shortfalls.[46]

Likewise, in France, where, in 2013, the average age of GPs was 52 years and one-quarter are likely to retire within five years, workforce projections predicted for the number of GPs to be 9 per cent lower in 2018 compared with 2007, whereas the number of specialists was projected to increase by 10 per cent during the same period.[38] A fall in the number of GPs by 2018 is anticipated to affect more than 80 per cent of French regions.

In Germany, the proportion of GPs in the ambulatory care sector has fallen steadily, from 60 per cent in 1991 to 46 per cent in 2012, while the proportion of specialists in ambulatory care rose by a factor of 1.5, from 40 per cent in 1991 to 54 per cent in 2012.[47] A 2010 report projected, based on trends of general practitioners entering and exiting the ambulatory care workforce, a decline in their number by about 7,000, or 13 per cent, by 2020.[48] This compares to a projected need of some 15,000 GPs by 2020 to secure care for the population in the light of demographic changes.[47]

Conversely, in the Netherlands, an anticipated shortfall of GPs of 5 per cent by 2010, projected in 2000, did not materialise. Indeed, in 2010, unmet GP demand was close to zero and the number of GP vacancies was low, at 1.7 per 100 GPs on average.[49] Furthermore, the resident-to-GP ratio has remained stable over the period 2000–2009: it increased slightly, from 2,483 residents per 1 full-time equivalent GP in 2000 to 2,350 per 1 full-time equivalent GP in 2009.

2.2. Education and training of medical doctors in general practice

2.2.1. Overview of medical education and training pathways in general practice

Figure 1 provides a summary overview of the medical education and training pathways in general practice in France, England, Germany and the Netherlands. We should reiterate that these illustrate a generalised perspective, and we recognise that specific career pathways will vary within and across countries.

In brief, in England, the training pathway for general practice typically takes nine to eleven years from admission to medical school to completion of the specialist GP qualification. The pathway comprises a (typically) five-year undergraduate degree programme, currently provided at 26 medical schools in England. Medical students graduate with a primary medical qualification, or undergraduate degree, such as the MBBS (Bachelor of Medicine, Bachelor of Surgery).With the award of the primary medical qualification, medical graduates will be able to apply for a provisional registration with a licence to practise with the General Medical Council (the independent regulator for doctors in the UK). Undergraduate training is followed by a two-year Foundation Programme, and, for those wishing to pursue general practice, a further three years of specialty training. Specialty training is completed with the national exam set by the Royal College of General Practitioners (RCGP). The national exam is required for doctors to obtain the Certificate of Completion of Training (CCT) to signify that they have reached the competency levels required for independent, safe general practice; doctors can then register with the GP register operated by the General Medical Council (GMC).

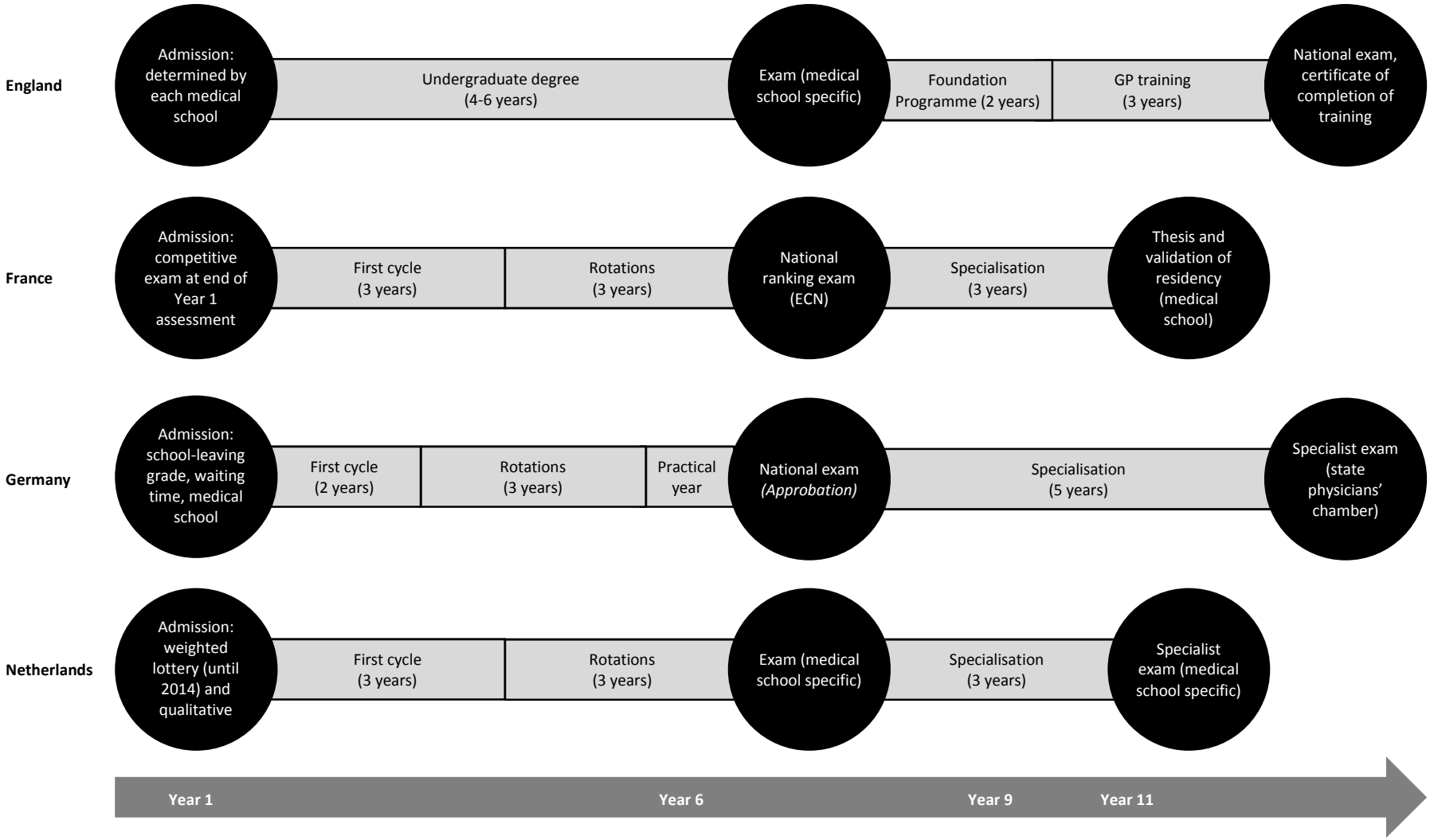

Figure 1 Medical education and training pathways for general practice in England, France, Germany and the Netherlands

In France, the training pathway for general practice takes nine years, from admission to medical school to obtaining the final specialist qualification. The pathway comprises three main cycles: At the undergraduate level, students complete a first cycle of three years of study, leading to a general degree in medical sciences. This is followed by the second three-year cycle, the *externat*, which is completed with a national ranking exam (*Epreuves Classantes Nationales*, ECN) which provides for an 'advanced degree in medical sciences' and determines which specialisations medical graduates will be permitted to pursue. Specialisation is through an *internat* (residency), which, in general practice, lasts three years and is completed with a thesis and validation of residency.

As in France, in the Netherlands training in general practice takes a total of nine years, but the actual education and training pathways differ between the two countries. The Dutch pathway comprises three components: a three-year bachelor's programme and a three-year master's programme, which, together, lead to a formal MD qualification. GP specialty training takes a further three years, which then leads to a specialist qualification. After obtaining the MD, most medical doctors spend some time in the 'interim period' before being admitted to specialist education. These doctors work as non-specialist doctors under the supervision of other specialists.

Conversely, and similar to the situation in England, education and training leading to a specialist qualification in general practice in Germany principally takes eleven years, from admission to one of the 37 universities with medical faculties to the final exam. The pathway comprises a five-year undergraduate degree programme, which is completed with a final 'practical year' and a national exam, following which graduates obtain the license to practice (*Approbation*), issued by the relevant state government. Specialty training in general practice is scheduled to take a further five years following the *Approbation,* although in practice, GP specialty training tends to be longer, lasting around eight years.[47 50] It is completed with a final exam overseen by the relevant state physicians' chamber.

2.2.2. Admission to medical school

The process of admission to medical school varies across countries, with only France maintaining an exclusively national admissions process. In England and, from 2014, the Netherlands, admission is determined by individual medical schools, albeit within a nationally set framework. In Germany, admission to medical school is determined by a combination of nationally set processes and selection by individual medical schools.

In England, undergraduate medical training is guided by the General Medical Council (GMC), which specifies the standards and outcomes for admission, curriculum and assessment.[51] Medical schools individually set criteria and processes for admission, although they are accountable to the GMC in ensuring that admission is fair, open and objective. Admission to medical school is guided by a number of principles, including, among others, that selection for medical school implies selection for the medical profession; that the process should select those with greatest aptitude for medical training rather than those with high academic ability; that applicants must pass a number of checks prior to enrolment (e.g. criminal record checks); and that applicants should demonstrate some understanding of what a career in medicine involves, as well as their understanding of, and suitability for, a caring profession. The number of places to be offered is determined jointly by the Department of Health and the Higher Education

Funding Council for England (HEFCE), with the department determining the overall number and HEFCE the individual distribution to medical schools. The target intakes for 2005–2006 to 2011–2012 have remained constant, at 6,195 students in England, although this was exceeded each year by around 200–300 students. Target intakes are set to reduce by 2 per cent per year starting in 2013–2014.[52]

Conversely, in France, people wishing to pursue a career in medicine enrol in one of the 47 medical schools and undertake a first year of health studies that is common to all students wishing to pursue a degree in medicine, dentistry, pharmacy or midwifery.[53] Year 1 is completed with a very selective and competitive exam, following which only 30 per cent of students will be permitted to carry on studying medicine. The number of places available at medical schools is defined at the national and regional levels, involving, at the national level, the Ministry of Health, in collaboration with the Ministry of Higher Education, and, at the regional level, the regional health agencies (*Agence régionale de santé*, ARS), as part of their regional plans for health services capacity.[54] Decisions are informed by a number of stakeholders at the various administrative tiers and are determined on the basis of the historical number of students and places, the supply of services in the region (or, in the case of general practice, the number and age of GPs) and teaching and support capacity in universities and hospitals. In 2012–2013, the number of places available to students entering year 2 was just under 7,500.

As indicated above, Germany and, until recently, the Netherlands use a combination of nationally determined admission criteria and student selection by individual medical schools. In the Netherlands, eligibility for medical studies requires students to complete an upper-level secondary education degree in the subjects of physics, chemistry, biology and mathematics, and to pass a national examination in each of these subjects. The Ministry of Education, Culture and Science decides yearly upon the request of the eight medical schools to subsidise a certain number of medical students (*numerus fixus*, currently 3,050). Until 2014, students were admitted to medical school in one of two ways. The first was a national lottery procedure, by which applicants wishing to study medicine were assigned a random number, which was further adjusted by the grade the applicant obtained in the aforementioned national exam. The resulting 3,050 applicants with the lowest number were then admitted to medical school (typically, this meant applicants with an average national exam grade higher than 8 out of 10). The second, decentralised process involves a qualitative competitive selection procedure, which is administered by individual medical schools. From 2014, admission to medical school is solely through the second, decentralised selection procedure.[55]

In Germany, admission to medical school is based on one of three criteria: (i) final secondary school exam grade (*Abitur*); (ii) waiting time (number of half years or semesters since obtaining the university entrance qualification minus number of semesters enrolled in a German university in a subject other than medicine); and (iii) selection criteria set by individual medical schools. Twenty per cent of applicants are admitted on the basis of having achieved top grades in the final secondary school exam (*Abiturbestenqoute*), twenty per cent on the basis of their waiting time and the remainder on the basis of selection criteria set by individual medical schools.[56] The latter comprise a combination of two or more of the following routes: final school grade, weighted individual school leaving grades, a scholastic aptitude test, an interview, and other criteria – although the school leaving grade remains a significant factor in the selection process. The annual number of places available at medical school is determined by a *numerus clausus*, which is calculated from the number of potentially available places and the number of applicants.

The number of places at medical school has remained fairly stable over the past 30 years, at between 10,000 and 11,000 per year.[57] Taken together, the winter half-year 2013–2014 and summer half-year 2014 represented a total of 10,727 places and 63,448 applicants (around 6 applicants per place).[58 59]

2.2.3. Undergraduate medical education and training

Reflecting the process of admission to medical school, the format and delivery of undergraduate medical education and training also varies across countries.

In England, medical schools are responsible for delivering a curriculum and means of assessment that meet the standards and outcomes set by the GMC.[60] It defines the knowledge, skills, behaviours that students should learn at any UK medical school and specifies the outcomes that students should attain, differentiating three domains: (i) the doctor as a scholar and scientist; (ii) the doctor as a practitioner; and (iii) the doctor as a professional. While all medical schools must pertain to the GMC principles and meet quality standards, the format and delivery of the curriculum at different medical schools can vary considerably. The five-year degree programme includes mandatory short-term placements in different NHS settings, including in primary care, and NHS organisations have a responsibility to make available the staff, facilities and practical support to deliver the clinical aspects of the curriculum. The nature and scope of exposure to clinical practice varies across medical schools, with some medical schools using general practice for a significant part of their general medical training. Overall, there is increasing emphasis on patient contact earlier on in the curriculum, and there is also a drive for students to experience primary care as part of their undergraduate training.

In France, the undergraduate curriculum is defined at the national level by the ministries of health and of education and set out in law. Decisions are informed by a range of stakeholders, including professional bodies, medical students' associations, and regional health agencies. Following successful entry into medical studies, students pursue two further years of medical education that are common to all medical students, and which are mainly composed of lectures, supervisions, and some short-term placements (e.g. nursing internship). At the end of the third year, students obtain a general degree in medical sciences, which qualifies them for entry into the second three-year cycle, commonly referred to as *externat*. The *externat* equips students with knowledge and practical experience of medicine. The programme is organised around pathologies, their treatment and their prevention.[61] Students mostly gain experience in hospital settings (which is associated with a small payment of between €130 and €250 per month, paid through the hospital from a specific budget, the 'Merri allocation (*Missions d'enseignement, de recherche, de référence et d'innovation*, see below). Although it has been mandatory, since 1997, that students complete an internship in general practice, not all medical schools offer such an internship.[62] Furthermore, where such internships are offered, they tend to be shorter than those based in a hospital.

The Netherlands is perhaps more similar to England in that the curriculum for undergraduate medical education is based on the Dutch framework for medical education, which sets out the national objectives for medical education and identifies seven core competencies: medical expert, communicator, collaborator, manager, health advocate, scholar and professional.[63] The delivery of this framework is the responsibility of each of the eight medical schools, which set their own specific curriculum. Throughout undergraduate medical training, a day or half a day per week is dedicated to training in physical

examination skills, communication skills, professional behaviour and clinical reasoning. Most medical schools also offer clinical experience throughout undergraduate medical education, typically in the form of first-year mandatory nursing aid work or junior clerkships. Most clerkships take place in the master's programme of medical education, and these are generally located in university medical centres or in other hospitals. Most schools also provide for a mandatory general practice clerkship of six to eight weeks' duration.[64]

In Germany, undergraduate medical education is guided by a national framework as set out in the licensing regulations for physicians (*Approbationsordnung*) issued by the Ministry of Health.[65] Medical education comprises three parts: basic science (first two years), followed by a clinical part (three years), and a practical year (year 6). During the preclinical period, students also receive training in first aid, and they have to undertake three months' of mandatory practical nursing training in a hospital. The clinical part of the training includes work placements (*Blockpraktikum*) of one to two weeks' duration in a range of clinical fields, including in general practice (a minimum of two weeks), as well as a four-month clinical elective (*Famulatur*) during holidays,[66] which is divided into four one-month clerkships, of which one must be undertaken in a family practice. The final clinical year (*Praktisches Jahr*) consists of 48 consecutive weeks of practical training, and is divided into three four-month clinical rotations, of which two have to be undertaken in internal medicine and surgery. The third rotation is optional and can be based in general practice or in a specialty of the student's choice.

Assessment

In all four countries, undergraduate medical training is completed with a primary medical qualification, which, in England, Germany and the Netherlands, permits graduates to register with the relevant national authorities, and, in Germany, to practise as a physician.

In England, the undergraduate medical programme is completed with an undergraduate degree. There is no common national exam for medical graduates; instead, assessment is set by individual medical schools, albeit within the framework set by the General Medical Council.[51] The assessment has to ensure that graduates demonstrate all the 'outcomes for graduates' set out by the GMC, as well as that it is timely, valid, reliable, generalisable and fair; that students are well informed about the nature of the assessment; and that examiners and assessors are appropriately selected, trained, supported and appraised, among other criteria. There has been discussion about moving towards having students take a national exam prior to registration with the GMC to ensure that all graduates have passed the same assessment and so enhance patient safety. The Medical Schools Council has objected to this on the grounds that it might risk emphasising learning over other parts of the medical course, in addition to challenges of implementing such an approach in practice.[67] Performance in the undergraduate education programme forms the basis for ranking students who apply to enter the Foundation Programme (see below). Applicants are assessed and ranked on their performance at medical school in relation to the graduating cohort.

In France, completion of the first two cycles of medical studies is followed by the final exam, the aforementioned national ranking exam (ECN). It ranks all medical students across the country, and those with the highest grades may then choose the medical or surgical specialty (from among 12) and the location for the next phase of their training among places that are available (in each specialty and medical

school) as determined by the *numerus clausus*. Students also obtain an 'advanced degree in medical sciences'.[68]

Again similar to England, in the Netherlands, the undergraduate medical programme is completed by an exam, which is set by individual medical schools. Following successful completion of their undergraduate medical training, students receive both a master's degree and an MD. Medical graduates can then formally register as a medical doctor.[69] At this stage, newly qualified medical doctors may legally prescribe medication, but they may only work under supervision until they have completed residency training. Many graduates undertake 'non-residency' work for a period of six months to one year following registration to gain experience in other specialties, such as family medicine or emergency medicine, before applying for specialty training or while waiting for admission to their preferred specialty. The non-residency work undertaken during this 'interim period' will then be considered when they apply for specialty training.

In Germany, medical students have to sit three national medical exams (*Ärztliche Prüfung*), with the first taking place two years after entry, the second after three further years and successful passing of the first exam, and the third following completion of the final practical year. The requirements for the exam are set out in the aforementioned licensing regulations for physicians.[65] These stipulate the areas to be covered by the three national exams, as well as their format, which consists of nationally standardised written components (first and second exam) and an oral-practical exam (first and third exam). For example, as part of the oral examination (third exam), students have to demonstrate that they are able to apply the principles of assessing a patient; able to determine the therapeutic direction, including prescribing pharmaceutical treatment; have an understanding of the principles of health promotion, disease prevention and care coordination; and have a general understanding of the ethical principles of medical care and the ability to adapt their behaviour towards the individual patient's needs. Following successful passing of the final exam, medical graduates can apply to obtain their license to practice (*Approbation*). This principally permits physicians to practise independently as a doctor; however, in order to set up practice under the statutory health insurance system, physicians have to be listed on the medical register, and a core requirement for registration is a specialist qualification in general practice or another specialty.[70]

Table 5 provides a summary overview of the key features of the medical undergraduate pathway in the four countries reviewed.

Table 5 Summary overview of key features of the medical undergraduate pathway in four countries

Student selection	Determining the number of places	Curriculum development and delivery	Duration	Assessment	Degree awarded
England					
Medical schools (n=26) set criteria and processes for admission within	Determined jointly by the Department of Health (total number) and the Higher Education Funding Council	GMC sets standards and outcomes; medical schools	5 years	Exam set by individual medical schools	Bachelor of Medicine, Bachelor of Surgery, etc.;

Student selection	Determining the number of places	Curriculum development and delivery	Duration	Assessment	Degree awarded
the framework set by the General Medical Council (GMC)	for England (distribution among medical schools) Annual number of places: 6,195 (2005–2006 to 2011–2012) Number of students/100,000 population: 11.6 students	set and deliver own curriculum within framework set by GMC		within framework set by GMC	newly qualified physicians can apply for provisional license to practice with GMC, but may only practice under supervision
France					
Selection is at central level after first year of health studies, based on competitive national exam (30% top grade students)	Defined by ministries of health and of higher education, informed by regional health agencies as part of regional plans for health services capacity (numerus clausus) Total number of places (2012–2013): 7,500 (entry year 2) Number of students/100,000 population: 11.8 students	Ministries of health and of higher education define the curriculum (informed by other stakeholders), set in legislation; medical schools deliver curriculum according to national regulation	6 years	National ranking exam (Epreuves Classantes Nationales, ECN)	Advanced degree in medical sciences; newly qualified physician may practise under supervision only
Germany					
Three routes: (i) final secondary school exam grade (top grade) (20%) (ii) waiting time (20%) (iii) criteria set by individual medical schools (n=37) (final school grade remains key criterion)	Agreement between individual states and universities Total number of places (2013–2014): 10,727 Number of students/100,000 population: 13.1 students	National regulation issued by Ministry of Health; medical schools deliver curriculum in line with the national framework	6 years	National exam	Physician license to practice (Approbation) principally permits newly qualified physician to practise, but setting up practice in the SHI system requires qualification as GP or other specialty
Netherlands					
Until 2014:	Defined by the Ministry of Education, Culture and	Dutch framework for medical	6 years	Exam set by individual	Master's degree and MD; newly

Student selection	Determining the number of places	Curriculum development and delivery	Duration	Assessment	Degree awarded
Two routes: (i) centralised: national lottery based on grade obtained in national school leaving exam (ii) decentralised: qualitative competitive exam set by individual medical schools (n=8) From 2014: qualitative competitive exam set by individual medical schools	Science, informed by Ministry of Health (numerus fixus) Total number of places (2014): 3,050 Number of students/100,000 population: 18.2 students	education sets out the national objectives for medical education; medical schools set and deliver curriculum within national framework		medical schools within national framework	qualified physician may practise under supervision only

Note: The number of medical students per 100,000 population was calculated from population estimates derived from the OECD (France, Germany, the Netherlans) (2012)[71] and the UK National Office for Statistics (England) (2012).[72]

2.2.4. Specialty training in general practice

Specialty training in general practice varies substantially across countries reviewed for this study, with differences in the nature and scope of exposure to clinical practice vis-à-vis formal taught course elements and arrangements for training in primary or ambulatory care settings. This is further summarised in Table 6, which also describes the types of clinical practice students experience in undergraduate medical training.

Table 6 Elements of exposure to general practice during medical education and training in four countries

During medical school	Following completion of primary qualification
England	
• Mandatory short-term placements. Requirements vary across medical schools	• Foundation years: all doctors are to undertake a community placement by 2017 • GP training: minimum 12 months (over 3 years) in general practice
France	
• Since 1997 mandatory internship in general practice (although only about one half of students undertake one [2011])	General practice: • Mandatory internship in general practice setting, 6 months • Optional primary care placement in an ambulatory

During medical school	Following completion of primary qualification
	care settings (stage ambulatoire en soins primaires en autonomie supervisée, SASPAS), 6 months; can take place in general practice or in alternative settings (school, prison, voluntary sector, etc.)
Germany	
• placements in a range of clinical fields, including in general practice (minimum of 2 weeks) • Mandatory 4-week clinical elective in family practice (Famulatur) • Practical year (year 6): optional 4-month placement in family practice	General practice: • 3 years of training in internal medicine in a hospital, of which 1.5 years may be spent in the fields of direct patient care (including 3-month phases)) in an ambulatory care setting • 2 years of mandatory training in general practice (of which up to 6 months may be spent in surgery) • 80-hour specialist course in basic psychosomatic care
Netherlands	
• Short-time placements in general practice available in some medical schools during first 3 'bachelor's' years • Longer rotations during 3-year 'master's' programme, including primary care	General practice: • Years 1 and 3 are spent working in a GP practice 4 days a week • Year 2 comprises rotations in a general hospital (6 months), a psychiatric hospital (3 months), and a nursing home (3 months)

England

In England, postgraduate medical training involves two components: a two-year Foundation Programme, followed by specialty training, which, in the case of general practice, takes three years. As with undergraduate training, the GMC has responsibility for setting standards and outcomes for postgraduate education and training, including the Foundation Programme.

Foundation Programme

The Foundation Programme is developed by the Academy of Medical Royal Colleges and approved by the GMC.[73] It aims to provide generic training to equip foundation doctors with the range of essential interpersonal and clinical skills for managing patients; all foundation doctors must have opportunities to understand community care provision, and the majority should be offered community placements.

Admission to foundation training is competitive. It is based predominantly on medical school performance, although applicants are also required to pass a 'situational judgement test', which is a measure of meeting the attributes required to be a foundation doctor. Admission is coordinated nationally; the number of vacancies for foundation posts is determined at the regional level, by each of the eleven Local Education and Training Boards across England, and based on workforce planning by the Department of Health. For example, by August 2012, around 6,750 places each were available for Foundation year (F1) and Foundation year 2 (F2) (excluding Academic Foundation Programme places).[74] Where areas are oversubscribed, applicants are allocated in the order of their total application score.

Training typically involves three four-month rotations in different specialties. In 2013, placements in general practice were commonly undertaken in year 2, with 41 per cent of foundation doctors choosing to do so.[74] The Foundation Programme concludes with an assessment that is conducted by clinical or educational supervisors; it involves submission of a portfolio that includes feedback from senior doctors, team assessments of behaviour, engagement with supervised learning events, reflective practice throughout placements and satisfactory demonstration of core procedural skills as required by the GMC.[73] The assessment is facilitated through use of an E-portfolio.

Specialty training in general practice

Following successful completion of the foundation training, doctors can enter specialty training. Recruitment to general practice training is coordinated by a National Recruitment Office for General Practice training.[75] The number of GP specialty training posts is negotiated between the Local Education and Training Boards and the Department of Health. Recruitment to the programme is competitive, and applicants have to undertake a computer-based assessment. In 2013, there were 3,291 vacancies, of which 98 per cent were filled.[76] There is an indication that the number of applicants for the 2014 training programme has fallen by 15 per cent compared with 2013.

GP specialty training takes three years, with a minimum requirement to spend 12 months in general practice. The Royal College of General Practitioners (RCGP) has been designated by the GMC to oversee training. Training is concluded with the (national) Member of the Royal College of General Practitioners (MRCGP) exam, which includes an applied knowledge test, a clinical skills assessment and a workplace assessment.[77] Following successful completion of this exam, and if they are deemed competent, GPs are awarded a Certificate of Completion of Training (CCT) to signify that they have reached the competency level required for independent, safe general practice. Doctors can then apply to register on the GP register.[78]

The current programme of specialist GP training was reviewed by the Royal College of General Practitioners in 2012. This was partly in recognition that the UK had the shortest general practice training programme of 14 European countries and that general practice was the shortest of all UK medical specialty training. It was also prompted by changing population health needs.[79] The review resulted in a proposal for GP training to be extended to four years. A proposed educational model for enhancing and extending GP training in all four UK nations was published in 2013.[80] Proposed changes were recommended to take place from 2014 onwards, but they have yet to be implemented.

France

Following completion of the first two cycles of medical studies, medical graduates enter specialty training, called the *internat* (residency). The number of available places is defined by the ministries of health and of higher education, informed by regional health agencies as part of regional plans for health services capacity. These two ministries also define the curriculum, but this is informed by other stakeholders. In 2012, there were 3,543 training places for general practice;[81] for those specialising in general practice, the *internat* lasts three years (compared with, for example, five years for surgical specialties), and trainees undertake at least six different residency placements in addition to completing taught course elements. There are two types of placements in ambulatory care.[82] They involve, first, an internship in general

practice, usually undertaken during the second year, during which the trainee gradually gains autonomy and performs an average of three to four medical tasks (acts) per day, such as medical consultations and diagnostic tasks. The second placement, the *stage ambulatoire en soins primaires en autonomie supervisée* (SASPAS), is usually undertaken during the third year, following successful completion of the first placement; it can be set in general practice or in alternative settings (e.g. school, prison, voluntary sector).[82] In theory, students can spend an additional year in ambulatory care settings through placements in specialist practices, such as gynaecology or paediatrics, and an additional half year in the SASPAS. However, in practice, students tend to spend only the required minimum of one year in ambulatory care settings because of an undersupply of trainers in general practice.

The third cycle is completed with the validation of the residency and the completion of a thesis, both organised by the medical school. Successful students will then be awarded a Doctor in Medicine degree.[68]

The Netherlands

In the Netherlands, specialty training in general practice takes three years, and approximately 30 per cent of medical graduates pursue postgraduate training in general practice.[37] The Dutch college of general practitioners (*Nederlands Huisartsen Genootschap*, NHG)) is responsible for setting the content of and requirements for GP training. Each of the eight medical schools is then responsible for organising postgraduate GP training for their students.[83]

Previously, application for GP specialty training was through the individual medical school. As of 2014, the application process for general practice is centralised and administered by the Dutch training institute for general practitioners (*Huisarts Opleiding Nederland*).[84] Medical doctors wishing to pursue postgraduate GP training must submit their application to the institute. The remainder of the selection process, involving a knowledge-based exam and a STARR-interview – consisting of the components situation, task, action, result and reflection – is also determined by the institute but carried out by the individual medical schools. To be eligible for selection, the applicant must be registered according to the Dutch healthcare professions act (*Wet op de beroepen in de individuele gezondheidszorg*, also (known as the Wet BIG), and must possess a recognised MD qualification.

Each of the eight medical schools has a general practitioner training institute, which provides taught courses in general practice. Throughout the three-year training period, GP residents attend medical school one day per week and spend the remaining days working in a clinical setting. The first and third years of GP training are spent working in a GP practice.[49] Medical schools have prearranged agreements with accredited GP training practices, and together they are then responsible for making the arrangements for the placement of GP trainees into specific GP practices.[85] The second year of training takes place in three different healthcare institutions: six months in a general hospital, three months in a psychiatric hospital and three months in a nursing home.[49]

Assessment of GP trainees is centrally organised by a committee drawn from the eight universities. All Dutch GP trainees must sit the 'national GP knowledge test' at fixed intervals throughout their postgraduate training. Students should pass this exam at least once a year. The test is set according to a

blueprint that covers all aspects of clinical care, using the different chapters of the *International Classification of Primacy Care*.

Germany

Specialty training in Germany is overseen by the medical profession, through the state chambers of physicians (*Landesärztekammer*, LÄK) (state chamber of physicians). A national framework is set out by the German Medical Association (*Bundesärztekammer*, BÄK) in what is referred to as 'model specialty training regulations' ([*Muster*-] *Weiterbildungsordnung*).[31] The responsibility for delivering and setting abiding standards based on this framework lies with the state chambers of physicians. The framework describes the general requirements for specialty training in general practice, which include a total of five years of training with an 'authorised specialist trainer at a specialty training facility', and which comprises three years of training in internal medicine in a hospital or a maximum of one and a half years of these three years in an ambulatory care setting, as well as two years of mandatory training in general practice, although part of this period may be spent in surgery. It also stipulates a requirement for trainees to undertake 80 hours of training in basic psychosomatic care. It further sets out the skills, knowledge and competencies to be acquired.

Training in general practice (and any other specialty) is almost entirely 'training on the job' and does not include formal taught course elements. There are currently no what has been referred to as 'vocational training schemes' with guaranteed posts, which some commentators perceive to pose a key challenge to postgraduate training in general practice in Germany.[86] Qualified physicians seeking to pursue specialty training have to organise the different rotations required for a given specialist qualification themselves, relying on the availability of relevant posts that would permit meeting the requirements. At the same time, within general practice, postgraduate training networks (*Weiterbildungsverbund*) are increasingly being established to facilitate rotation.[87]

During their training, trainees must fulfil the points stipulated in the specialty training guidance, as described above.[66] Following completion of training, the state chamber of physicians will determine, on the basis of the certificates issued by the GP trainers, whether the trainee is ready for his or her final exam, which is taken as an oral examination before a committee gathered by the state chamber of physicians and leads to specialist qualification in general practice.

Table 7 provides a summary overview of the key features of postgraduate training in general practice in the four countries reviewed.

Table 7 Summary overview of key features of postgraduate training in general practice in four countries

Trainee selection	Determination of number of places	Curriculum development and delivery	Duration	Assessment	Degree awarded
England					
Foundation Programme					
Competitive selection process	Determined at the regional level (Local	GMC sets standards and outcomes	2 years	Assessment conducted by	Foundation Achievement

Trainee selection	Determination of number of places	Curriculum development and delivery	Duration	Assessment	Degree awarded
based primarily on medical school performance; admission is coordinated nationally	Education and Training Boards) based on workforce planning at the national level (Department of Health) Number of places (August 2012): F1: 6,759/F2: 6,734 (excluding Academic Foundation Programme places)	Academy of Royal Medical Colleges develops Foundation Programme, which is approved by GMC		clinical or educational supervisors (submission of portfolio)	of Competence Document (FACD)
Specialty training in general practice					
Competitive recruitment process coordinated by National Recruitment Office for General Practice Training	Negotiated between Local Education and Training Boards and Department of Health; number of vacancies (August 2013): 3,291 (98% filled)	Overseen by the Royal College of General Practitioners (RCGP) designated by the GMC)	3 years	Member of Royal College of General Practitioners (MRCGP) exam (applied knowledge, clinical skills assessment, workplace assessment) following GMC standards	Certificate of Completion of Training (CCT); doctors can apply to register with GP register
France					
Competitive selection following national ranking exam (ECN)	Defined by ministries of health and of higher education, informed by regional health agencies as part of regional plans for health services capacity; number of places (2012): 3,543	Ministries of health and of higher education define the curriculum (informed by other stakeholders); medical schools deliver curriculum according to national regulation	3 years	Validation of residency and thesis	Doctor in Medicine
Germany					
Individual physician applies to vacancy; postgraduate training networks established to facilitate rotation	There is no planning of number of training places; national agreement among key actors foresees financial support for a minimum of 5,000 training places per year; number of physicians in GP training (ambulatory care and inpatient sector) (2012): 3,531	Federal physicians' chamber sets framework; state chambers of physicians set abiding standards	5 years*	Set by individual committee gathered by state chambers of physicians	Specialist physician in general practice

Trainee selection	Determination of number of places	Curriculum development and delivery	Duration	Assessment	Degree awarded
	(FTE)				
Netherlands					
Competitive selection process, coordinated by Dutch Training Institute for General Practitioners,; medical schools undertake selection	Defined by the Ministry of Public Health, Welfare and Sport; number of newly recruited trainees (2013): 673 (total in training: 1,880)	Medical specialisms board (CGS) determines the education and training requirements for all 33 specialisms, including general practice; medical schools organise postgraduate GP training for their students; each medical school has a GP training institute	3 years	Assessment of GP trainees is centrally organised by a committee drawn from the eight universities; trainees must sit the national GP knowledge test at fixed intervals throughout training and should pass this exam at least once a year	Registered general practitioner

Note: * While specialty training in general practice is scheduled to take five years in theory, in practice it tends to last around eight years.[47 50]

2.2.5. Financing of medical education and training in general practice

In all four countries reviewed for this study, medical education and training are part-funded by government, but the nature and scope of support that is provided varies.

In England, medical education is funded from three sources: student fees, Higher Education Funding Council (HEFCE) allocations for teaching, and Service Increment for Teaching (SIFT) payments to hospitals and GPs. Medical schools in England charge tuition fees of up to a maximum of £9,000 per annum. HEFCE allocations derive from the Department for Business, Innovation and Skills and the Department of Health.[88] They take the form of a grant allocated to each medical school, the amount of which is determined by the target intake. SIFT payments compensate providers in the NHS delivering undergraduate education for loss of service incurred through teaching.[89] Rates are negotiated between medical schools and regional branches of Health Education England (HEE), who are responsible for planning and developing the whole healthcare and public health workforce. Postgraduate training is funded by the Department of Health through Health Education England; a significant proportion of the budget, which is allocated through regional Health Education England areas, is to cover doctors' salaries while they are undertaking foundation and specialty training.

In France, medical undergraduate training is funded by the Ministry of Higher Education and Research through the allocation of a per capita budget to universities, covering about 80–90 per cent of the university budget. During rotations in the second cycle (*externat*), medical students begin to receive some payment for their clinical work in hospital and ambulatory care settings. This allowance is paid through a specific budget allocation, the aforementioned 'Merri' allocation, which is funded by the Ministry of Health and distributed through the regional health agencies.[90] Specialist trainees' (*internat*) salaries are also paid through the Merri allocation. Lecturers and trainers are paid by the Ministry of Higher Education and Research. These payments are in addition to the salary they receive from the Ministry of

Health for clinical work, with the exception of trainers in ambulatory care settings, who are paid through the aforementioned Merri allocation. Thus, most of the financing of specialty training is supported by the Ministry of Health through the regional health agencies.

Similar to France, in the Netherlands, the Ministry of Education is responsible for the financing of undergraduate medical education. Students are required to pay an annual tuition fee of approximately €1,900.[91] Financing of undergraduate medical education consists of a basic student grant, an additional student grant, a student public transport travel card and a student loan. Students apply for the additional grant and the loan separately. Specialist GP training is financed by the Ministry of Health through the foundation for vocational training of GPs (*Stichting* Beroeps *Opleiding Huisartsen*, SBOH). All medical doctors wishing to specialise in general practice must apply to the SBOH for funding; those entering GP training must also pay a registration fee of €375 to be added to the training register.[92] The SBOH is responsible for financing four different aspects of medical training and practice: employer costs of training doctors to become specialists, the cost of training institutes for the theoretical education within the training, the cost of trainers and developments, and innovation in quality and cooperative projects.

In Germany, financing of higher education is the responsibility of the 16 states, which contribute some 80 per cent of funding for universities, complemented by funding from the federal government, of 10–15 per cent.[93] Undergraduate medical education is generally free of charge for students,[94] although students have to make a regular contribution, typically between €150 and €300 per half year semester (*Semesterbeitrag*). Grants and student loans are available. Regarding specialty training in general practice, trainees in both the ambulatory and hospital sectors are supported as per agreement between the national associations of SHI funds (*GKV-Spitzenverband*), the national association of SHI physicians (KBV) and the German Hospital Federation (*Deutsche Krankenhausgesellschaft*, DKG), in consultation with the German Medical Association (BÄK),[95] at currently €3,500 (for a full-time trainee post) in the ambulatory care setting, with the costs to be covered by the health insurers and the regional SHI physicians' associations. To further encourage training in underserved areas, financial support can be increased by €500.[87] In 2012, the number of full-time places supported under this scheme was 3,531 in the ambulatory and inpatient sectors combined, which is lower than the minimum of 5,000 places that are to be supported as per national agreement.[87]

2.2.6. Quality standards for medical education and training

The mechanisms that have been put in place to ensure quality in the delivery of medical education and training in the countries reviewed vary, both within countries as it relates to undergraduate and specialty training, as well as across countries.

In England, the GMC has a statutory responsibility for quality assurance in undergraduate and postgraduate medical education, with a Quality Improvement Framework setting out the relevant requirements.[60]The GMC conducts a range of activities to ensure quality, including, for example, regular reports by medical schools and Local Education and Training Boards that describe their activity as it relates to the GMC's standards; routine visits by the GMC to medical schools and Local Education and Training Boards; and national trainee and trainer surveys.

To ensure quality control of GPs providing training as part of undergraduate programmes, medical schools undertake such activities as gathering student feedback, inspecting practices, and setting minimum requirements for GPs (e.g. regular attendance at meetings). With regard to GP specialty training, the GMC maintains a register of GP trainers. The requirements for GP trainers have become increasingly formalised, requiring, for example, that trainers hold a postgraduate certificate in medical education and that they have at least three years of experience working as a GP following qualification.[51]

In contrast, in France, there appears to be no dedicated organisation or mechanism to ensure and monitor the quality of medical education and training, although the national ranking exam that completes undergraduate training could be seen as an implicit tool for quality assurance. Since all students compete for the highest ranking at the national level, there is an incentive for medical schools to prepare them well by delivering high quality teaching. There is also a range of tools that can contribute to the harmonisation of training standards. This includes forms for validation of placements during specialty training or standards for supervising trainees during placements in general practice. For example, GPs eligible for the role of trainer (*Maître de stage universitaire*, MSU) have to register with a medical school, which awards the MSU title provided applicants meet nationally defined requirements. These include initial training in education, regular participation in professional development and commitment to regular evaluations.[96] They must also provide an environment conducive to learning. There is concern that the number of GP trainers may be too low to meet the demand of students, and it was noted that GPs are not necessarily willing to add hours to their workload by undertaking training activities.

In the Netherlands, a number of organisations are involved in ensuring the quality of medical education and training. This involves, at undergraduate level, the medical schools delivering education and, at the postgraduate level, the royal Dutch medical association (*Koninklijke Nederlandsche Maatschappij tot Bevordering der Geneeskunst*, KNMG), the national association of general practitioners (*Landelijke Huisartsen Vereniging*, LHV), the Dutch college of general practitioners (*Nederlands Huisartsen Genootschap*, NHG), the foundation for university training of GPs (*Stichting Verenigde Universitaire Huisartsopleidingen*, SVUH), the registration commission medical specialists (*Registratiecommissie Geneeskundig Specialisten*, RGS), and the national organisation of GPs in training. Quality of postgraduate training is overseen by the (registration commission for general practitioners (*Huisarts en Verpleeghuisarts Registratie Commissie*, HVRC), which is now part of the aforementioned registration commission of medical specialists (RGS). The national association of GP educators (*Landelijke Huisartsen Opleiders Vereniging*, LHOV) is responsible for ensuring the quality of GP trainers; it sets the standards and competencies for GP trainers as well as the accreditation requirements. The system in place to ensure the quality of GP specialty training involves a regular survey conducted among GPs and their trainers to assess their satisfaction with postgraduate general practice training.[97] A complementary survey of GP trainees is conducted after each year of their training; in it, trainees reflect on a number of aspects of their training. Survey results are shared with medical schools to inform their curriculum and the organisation of GP training.

As noted earlier, undergraduate medical education in Germany is guided by the national licensing regulations for physicians issued by the Ministry of Health, but the implementation and precise content can vary across medical schools. Quality assurance during undergraduate education and training, including of internships in general practice, can vary among universities, since standards for education are

also set locally. Responsibility for specialty training lies with the regional physicians' chambers.[98] Coordinating points, known as *Koordinierungsstellen für die Weiterbildung von Fachärzten in der Allgemeinmedizin* are located at the state chambers of physicians and introduced from 2010, were tasked with the organisation and coordination of specialty training in general practice at the state level, including, for example, assessing the quality of training institutions and overseeing training schedules of trainees, but the level of activity has remained low.[87]

2.2.7. Governance arrangements

Table 8 provides a summary overview of the range of actors and organisations involved in overseeing medical education and training in the four countries under review.

In England, the GMC regulates all stages of doctors' training and professional development. This is typically done through setting key standards and outcomes required at each stage, for example, in key documents, such as *Tomorrow's Doctors* and *The Trainee Doctor*.[51 78] The GMC then relies on other bodies, such as medical schools, Local Education and Training Boards and royal colleges, to develop and deliver curricula, assessment, quality management and quality assurance, as described above. The main implementing bodies are accountable to the GMC although further bodies may be accountable to them in turn. Although a large number of organisations may be potentially involved in shaping medical education and training in England, responsibilities are clearly set out in GMC documentation. The NHS regulates the provision and registration of GPs.

In France, the Ministry of Health and the Ministry of Higher Education jointly release decrees specifying the content of medical education. The content of courses in the second cycle is shaped by the publication of the national ranking exam items on the national centre for residency exam (*Centre National des Concours d'Internat,* CNCI) website,[99] jointly hosted by the Ministry of Health and the Ministry of Higher Education and Research. Curricula for specialty training are also developed on behalf of the Ministry of Health and the Ministry of Higher Education and published in the government gazette. It is in the third cycle that the role of the national college of general practice lecturers (*Collège national des généralistes enseignants*, CNGE) becomes most relevant, although the influence of the college is considered to be limited compared with the national colleges of lecturers) in other specialties.

Table 8 Oversight of undergraduate education and training and postgraduate GP specialty training in four countries

	Undergraduate education	Specialty training	Setting up practice
England	• General Medical Council (GMC) (national) • Medical schools (local)	• General Medical Council (GMC) (national) • Royal College of General Practitioners (RGCP) (national) • Local Education Training Boards (regional)	• NHS (national) – regulation • Royal College of General Practitioners (RCGP) (national) - support

	Undergraduate education	Specialty training	Setting up practice
France	• Ministry of Health and Ministry of Higher Education and Research (national) • Medical schools (local)	• National College of General Practice Lecturers (CNGE) (national) • Medical schools (local)	• French medical association (Ordre des médecins) (national) – regulation • Regional health agencies (ARS) (regional) - support
Germany	• Ministry of Health (national) • State governments responsible for higher education (regional) • Medical schools (local)	• German Medical Association (BÄK) (national) • State chambers of physicians (LÄK) (regional)	• National association of SHI physicians (KBV) (national) – support • Regional associations of SHI physicians (KV) (regional) – regulation and support
Netherlands	• Ministry of Education, Culture and Science • Medical schools (local)	• Royal Dutch Medical Association, National Association of General Practitioners , Dutch College of General Practitioners (national) • Medical schools (local)	• Ministry of Public Health, Welfare and Sport (national) – regulation • Registration Committee Medical Specialists (RGS) - registration

In the Netherlands, medical education and training is governed by a range of organisations. The Royal Dutch Medical Association (KMNG) is responsible for postgraduate medical education, accreditation of medical specialists (including GPs), and promoting professional standards for different specialists.[100] Its medical specialisms board (CGS) determines the education and training requirements for all 33 specialisms, including general practice. The national association of General Practitioners (LHV), which is a member of the KMNG, together with the Dutch college of General Practitioners (NHG) develop guidelines for GPs.[101] Governance of medical schools takes place through the schools' councils, which are responsible for determining the minimum requirements necessary to obtain a bachelor's and master's degrees of medical science.[37] The quality of medical education is overseen by the General Practitioner Registration Committee, which became part of the newly established registration commission of medical specialists (RGS) in 2013. It (re-)licenses physicians and implements the decisions of the CGS.[102]

In Germany, governance of medical education and training is characterised by different actors that are responsible for different aspects from admission to undergraduate education and postgraduate specialisation. The prerequisites for becoming a member of the medical profession in Germany are set out in the 1987 medical practitioners act (*Bundesärzteordnung*), with the licensing regulations for physicians (*Approbationsordnung*) regulating undergraduate medical training in terms of general structure and content.[65] While setting the overarching framework, the regulation leaves some degree of freedom for individual medical schools in implementing the curriculum; since 1999, it has been possible for medical schools to implement 'experimental curricula' (*Modellstudiengang*, literally, model course) to test different approaches to deliver the education and training goals. Differing approaches to implementing the Licensing Regulations at the state level have led to variation in the content and structure of medical

education. At specialisation level, the framework for training is set by the German Medical Association, as mentioned above, and it is implemented at the state level by the state chambers of physicians, which also oversee the final exam.[103] Medical schools are not involved in postgraduate training. This separation was commented on by a range of key informants interviewed for this study, with some recognising the potential for medical schools to be more involved in further training, given their role in education, but also recognising that there are both structural and political challenges in creating such collaborations.

2.3. Approaches to ensuring the provision and distribution of the primary care workforce nationally and regionally

Key informants in the different countries who were interviewed for this study expressed different views on the extent to which the system in place for the education and training of the future GP workforce is considered effective and appropriate given the changing care needs of the population. Stakeholders in all countries noted that the changing disease burden and ageing populations place a particular burden on doctors delivering primary care, and that although training has improved over the years, with an increased focus on patient care and, in some countries, earlier exposure to clinical practice, there is still some way to go. Stakeholders in England highlighted how general practice training is thought to be strong in terms of the emphasis given to communication skills, although the increasing complexity of cases managed in primary care is seen to be very challenging. Similar concerns were expressed by stakeholders in the Netherlands.

While all countries included here face some challenges with regard to attracting medical graduates into general practice, the nature of the challenge differs. Evidence from France highlights the low status of GPs in terms of income and social security arrangements as one of the major barriers, alongside perceived risks of professional and geographical isolation. Accordingly, measures to enhance GPs status, for example, through financial incentives, are seen as crucial, although it was acknowledged that financial incentives on their own will not be sufficient to attract the required number of graduates into general practice. Key informants interviewed for this study suggested organisational arrangements that incentivise multi-professional health centres as a means to provide a support network and to reduce the isolation of GPs as the only provider responsible for continuity of care.

In England, there are also concerns about attracting sufficient numbers of medical graduates into general practice over other specialties. Achieving a national target of 50 per cent of medical students choosing general practice is considered to be very challenging, particularly given a recent reduction in the number of applications to GP specialty training. Although primary care is considered to be well developed and well regarded in England compared with other countries, there were concerns about the status and attractiveness of general practice. Key informants suggested that there needs to be a fundamental change in the distribution of resources from secondary to primary care. However, other aspects of general practice are also seen to deter doctors. These include a lack of flexibility in training, because doctors have to decide early on and have little opportunity to change specialty; lack of regulation of GP hours, challenging the balance with family life; and a perception of general practice having a negative reputation prompted by the media.

Conversely, in the Netherlands, attracting a sufficient number of doctors into general practice is seen less of a challenge; however, there is a perception of some difficulties in providing for a sufficient number of GP trainers and training practices. This latter point was also raised by key informants from France, who further highlighted the need to promote general practice within medical schools through the appointment of a greater number of professors and lecturers specialising in general practice.

Evidence from the literature and from the interviews identifies five types of measures that could potentially address some of the future challenges that the education and training system is likely to face. We discuss these in turn.

Enhancing recruitment into general practice

It is clear that the majority of medical students in the countries studied (and probably in other countries too) do not choose general practice as their first choice of career. According to one study, fewer than 10 per cent of medical students in Germany say that they want to pursue a career in general practice,[104] a finding confirmed in the most recent national survey of medical students, conducted in 2014. However, one-third of respondents expressed a potential interest in pursuing general practice as a possible career choice.[23] In France, in 2012, general practice was the second least popular specialty for medical students (its unpopularity exceeded only by occupational medicine).[81] Conversely, data for England and the Netherlands suggest that about 30 per cent of graduates express a preference for general practice as a career, which, in a recent prospective study of medical students, increased to 35 per cent after five years after graduation.[105]

Given problems of recruitment to general practice, one approach is to adopt a national planning strategy that regulates entry to individual medical specialties. As discussed above, England, France and the Netherlands all have regulatory mechanisms in place that limit the entry of doctors to training programmes for each medical specialty – for example, the number of training places available to doctors for general practice compared with training places for individual specialties (radiology, orthopaedics, etc). In these three countries entry is limited at the start of the specialty training (after the foundation years in England, in the third cycle in France, and after the master's degree in the Netherlands). In all cases, since it is difficult for doctors to move among training programmes, this appears to be an effective way to plan and regulate the entry of young doctors into different specialties.

Favourable experiences of general practice during training are also likely to influence young doctors' career choices. This may be during medical student years or following qualification. During the first two foundation years after graduation in England, doctors move through six four-month rotations. It is planned that all doctors will also undertake at least one community placement by 2017. This is intended to give direct experience of primary care to all doctors, whether or not they later choose careers in general practice.[106]

There is a prior question of whether medical students can be selected on the basis of their likely aptitude for general practice, and this has been an active debate in the Netherlands and, more recently, in Germany. In some parts of the world, such as Australia, Canada and the United States, medical schools have been established with a specific focus on producing graduates who would be likely to enter general practice (Box 1).

Apart from implementing regulatory mechanisms and designing training programmes to provide positive experiences of general practice, it is likely that a range of different factors influence the perceived attractiveness of general practice as a career. They include relatively low earnings in relation to other specialties, a negative perception of GPs' status, challenging working conditions, and lack of interest for working in underserved areas.

Increasing earnings

In many countries general practice is a low-earning specialty. Figure 2 shows GPs' and specialists' net earnings in relation to the average wage in each country in 2011.[107] This shows that in 2011, self-employed specialists in the Netherlands earned on average more than five times the average wage compared with self-employed GPs, who earned only three times the average wage. Salaried GPs earned just under twice the average wage (1.9 times). Equivalent figures for France were 3.6 for self-employed specialists, compared with 2.1 for self-employed GPs. In the United Kingdom, however, self-employed doctors (who include most GPs) earned considerably more than salaried doctors, so that in the NHS, earnings of GPs are equivalent to and often exceed those of specialists. For Germany, the OECD data shown in Figure 2 were available for salaried specialists only. Other sources suggest that, in Germany, the average net earnings of GPs may be between 10 per cent to one-third lower than that of a specialist practising in the ambulatory care sector.[47]

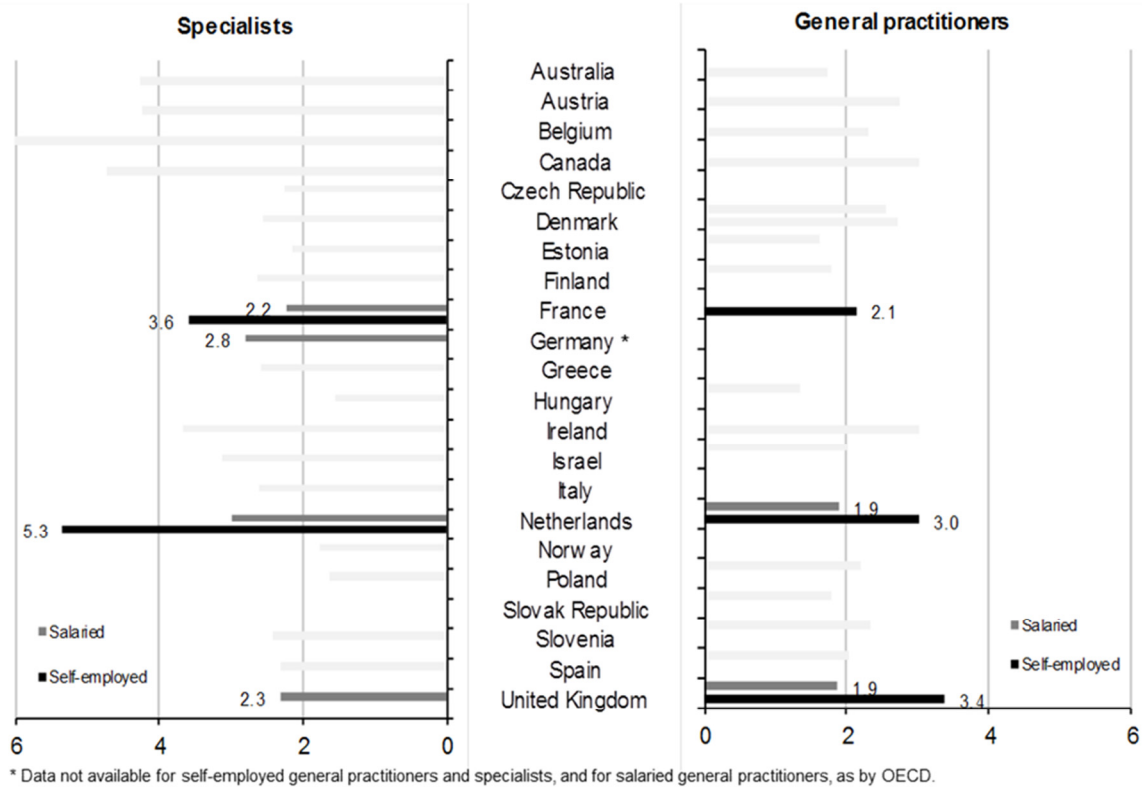

Figure 2 Remuneration of doctors (general practitioners and specialists), ratio to average wage, 2011, selected OECD countries

Source: OECD (2013)[107]

One survey of French medical students found that radiology and ophthalmology were very popular specialties;[81] these are procedure-based branches of medicine where fee-for-service income can be very high. Although numbers are difficult to compare, in the United States, in 2012, the average earnings of a family practitioner were $158,000 per annum, compared with $315,000 for a radiologist.[108] These data suggest that one potential way to increase the attractiveness of general practice as a profession is to increase earnings relative to other medical specialties.

Improving the status of GP

Another important factor influencing medical students' choice of career is the perceived status of general practice, as noted above. The reasons for the low status of general practice are likely to be multifactorial (and related in part to income). However, the experience of medical students at university is likely to be significant in forming their views of different branches of medicine. In many medical schools, teaching is dominated by specialists who may be implicitly or explicitly dismissive of general practice.

Although now somewhat historic, this attitude is typified in English medical history by 'Lord Moran's ladder'. In 1958, Lord Moran, a distinguished physician, was asked the following question by a Royal Commission: 'It has been put to us that the two branches of the profession, general practice and specialists, are not senior or junior to one another but they are level. Do you agree with that?' Lord Moran famously replied, 'All the people of outstanding merit, with few exceptions aimed to get on the [hospital] staff. There was no other aim, and it was a ladder of which some of them fell. How can you say that the people who get to the top of the ladder are the same as the people who fall off it? It seems to me so ludicrous.'[109] Although perhaps not expressed quite so forcefully, it is likely that such attitudes remain prevalent in medical schools.

One approach to addressing this problem relates to the status of general practice within medical schools. In England and the Netherlands, there are full professors of general practice in every medical school, and often several professors in the leading departments of primary medical care. These senior academics often play a central role in the development of the medical curriculum, and hence in influencing students' experience in primary care. England and the Netherlands are also the countries where the research productivity of academic general practitioners is higher than in any other country, including the United States.[110] In contrast, France and Germany do not have professors of general practice in every medical school, and (with a few exceptions) the research standing of departments of general practice is low. Indeed, one German study of medical students identified that having a chair in general practice is a strong predictor for choosing general practice as a career path.[111]

Increasing the academic stature of general practice is not an easy task, but the English experience shows that it can be done. For example, a report on research in primary care in 1997[112] was followed by a substantial government commitment to funding research in primary care. This commitment was maintained by successive governments, which have made additional investments in academic primary care and established a clear career pathway for GPs who wish to pursue an academic career. This has been accompanied by the development and resourcing of teaching practices in the community that can offer placements in the medical school. It is clear that the chance of a graduate wishing to enter general practice is greater if he or she has had a positive experience of general practice as a student.

Providing better working conditions

Among the concerns expressed by medical students about careers in general practice are high levels of workload and responsibility, professional and geographical isolation, and the administrative burden of running a private practice. In England, while the traditional model of general practice has been running it as a self-employed small business, young GPs increasingly prefer the role of a salaried doctor without administrative responsibilities – despite the lower earnings.[113] In France, schemes are being developed to make benefits such as sickness and maternity leave available to GPs, attempting to reduce the perceived risk to young practitioners of running their own practice.[114] Germany has also acted with local physician associations to provide support for doctors setting up practice and to provide employment opportunities for newly qualified doctors who do not wish to run their own business.[115]

While it may be difficult to change working conditions without a large increase in the number of doctors entering general practice, a range of things can be done to make general practice more attractive.

The first is to address professional isolation: the situation of a single-handed doctor in general practice is seen by medical students as being in stark contrast to the collegiality of the hospital ward. This isolation is mitigated to a degree by doctors working in groups, an important and significant trend in the past 20 years. In England, only 10 per cent of GPs practise single-handed, with over half now practising in groups of four or more GPs.[116] A further, more recent development of general practice in England is the 'federation' of groups of practices in order to be able to provide a wider range of services. In France, networks of practices are also being developed with the aim to reduce GP isolation and increase collaboration with other healthcare professionals.[117]

Professional isolation is felt particularly keenly by young practitioners in their early years, when they change from the relatively protected environment of a hospital. This can be addressed by specific programmes to support young doctors, such as the First5® programme run by the Royal College of General Practitioners in the UK, which is built on five pillars: facilitating networks encouraging peer support and mentoring through the development of local networks; promoting a sense of belonging and appropriate representation for the First5® cohort within the College; career mentorship; supporting revalidation; and continued professional development (known as CPD) and new skills.[118]

It is also important to recognise the changing nature of the workforce, with more than half of newly qualified doctors being women in many countries, including in Germany. Some of these doctors will choose to work part-time for some of their careers, and career opportunities need to be available that will be attractive to the changing workforce. A model of primary care based on solo responsibility and long hours is unlikely to attract this large and increasingly important section of the medical workforce into general practice.

Traditional models of general practice associated with high workloads and increased probability of burnout also affect retention in general practice. Especially in countries with favourable pension arrangements (e.g. England), it will be important to improve working conditions of more senior doctors to prevent the threat to workforce numbers caused by widespread early retirement. This is particularly important in countries where the current general practice workforce is skewed towards retirement, for example, in Germany, where, in 2013, 69 per cent of GPs were over 50 years of age.[119]

For a range of reasons, including those described here and the increasingly complex demands of an ageing population, it is unlikely that the solo practitioner model of general medical practice is one that will meet the needs of either patients or practitioners in the future. Attention needs to be given to how to meet both the changing needs of patients and the changing nature of the medical workforce.

Recruiting primary care doctors to work in underserved areas

An additional problem to that of recruiting young doctors into general practice is the even greater problem of attracting them to work in medically underserved areas, which are typically highly rural areas and areas of socio-economic deprivation. The problems faced by doctors in these areas are different – a demanding workload in deprived areas and professional isolation in rural areas – but the net result is the same, namely, difficulty in recruiting doctors to work in these areas.

This is a problem faced by many countries in the world. The range of strategies used to alleviate the problem have been described by Sibbald (2005),[120] who classified these strategies into three headings:

- Normative or missionary strategies, which aim to encourage a sense of responsibility to serve in places where needs are greatest, for example, through tailored education and training schemes, and rely heavily on symbolic rewards based on personal values or prestige.
- Utilitarian strategies, which aim to compensate doctors financially for the additional costs of serving deprived populations and offset other disadvantages through the provision of excellent facilities, good job structure and employment benefits.
- Coercive strategies, which require doctors to work for defined periods in designated underserved areas as a condition of training, financial support or licensure.

Sibbald (2005) describes the range of strategies that have been used in these ways as shown in Table 9.

Table 9 Strategies to promote recruitment and retention in underserved areas

	Strategic orientation		
Target level	**Normative**	**Utilitarian**	**Coercive**
Individual	Professional support and development schemes	One-off payments to attract or retain doctors; increased income; increased job flexibility and/or benefits	Education loan repayment of scholarship in return for obligated service
Provider organisation		Low-cost building and development loans	
State system	Education schemes designed to select and prepare doctors for service in underserved areas		Obligated service in designated areas for all graduate doctors; license or visa restrictions limiting immigrant doctors to work in underserved areas

Source: Adapted from Sibbald (2005)[120]

We identified a range of these strategies in the countries included in this report, but the experiences of other countries are also relevant. For example, Australia, Canada, Norway and the United States have established 'rural medical school programmes' that give preference to students from rural backgrounds and offer training in rural settings (Box 1).

There is some evidence that training in rural settings increases retention in those areas,[121] although it is possible that medical graduates would have opted to work in remote settings in any case.

Box 1 Rural medical school programmes in Australia, Canada and the United States

Although a 2009 systematic review of interventions for increasing the proportion of health professionals practising in rural and other underserved areas was unable to demonstrate robust evidence of an effective redistribution mechanism,[122] a small number of qualitative studies suggest that medical school rural programmes have the potential to attract more physicians into rural areas. The literature has particularly focused on Australia, Canada and the United States, where such programmes have been used to try to address recruitment issues in rural areas since the 1970s (e.g. Norris et al. 2006[123]). In a qualitative study of rural programmes in the three above-mentioned countries, Tesson et al. (2005) developed a useful typology of rural medical programmes by defining three distinct categories: (i) urban-based schools that have expanded their mandate to address the needs of specific rural and remote jurisdictions, (ii) de facto rural schools with a mandate to serve areas with substantial rural populations, and (iii) stand-alone rural schools that are new schools that have been created to meet the needs of defined rural and remote regions.[124] They concluded that all types of programmes had the potential to achieve positive results, but that the stand-alone schools were likely to have a greater impact thanks to their unambiguous mission and focus.

In Australia, the Flinders University Parallel Rural Community Curriculum (PRCC) is a well established example of the first category.[125] The PRCC comprises a full year of medical training in rural practices. A 2008 study showed that 70 per cent of the PRCC students had chosen to practise in rural locations, compared with 18 per cent of tertiary-trained students. Over 12 years, the program had proven to be sustainable in a private practice environment with a workforce shortage. In the United States, WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) has developed a similar programme, and its rural tracks have been considered a success for years.[123-126]

In a systematic review of medical school rural programmes in the United States, Rabinowitz et al. (2008) show the impact of rural school programmes on career choices.[127] Rural programmes were defined as programmes that have (i) as primary goal to increase supply of rural physicians and (ii) either a focussed rural admissions process (targeting students from rural background) or an extended (six months+) full-time clinical curriculum during the last two years of medical school. They found that across ten studies 26 per cent to 92 per cent (average weighted outcome: 57 per cent) of programme graduates ended up working in rural communities, versus 3 per cent of intention across all graduates. Among the studies included in the reviews, two studies calculated that retention rates several years after graduation reached 87 per cent and 79 per cent. Using conservative estimates, Rabinowitz et al. modelled these findings to predict that if 125 other medical schools offered similar programmes to 10 students per year, it would result in the provision of 1,139 new GPs in rural areas yearly (more than twice current number).[127]

Recent American studies have added to these positive results. Rabinowitz et al. (2012) showed that rural programme graduates were 10 times more likely to practise rural family medicine than others (relative risk [RR] = 10.0, confidence interval [CI] 8.7–11.6, P < .001) and almost 4 times as likely to practice any rural primary care specialty (RR 3.8, CI 3.5–4.2, P < .001).[128] Overall, rural programmes produced more rural family physicians than the other programmes combined (376 versus 254). In a study on the Rural Medical Education Programme (RMED) in Illinois, which recruited students from rural backgrounds, Glasser et al. (2011) found that 76 per cent of RMEP students entered primary care residencies and that 64.4 per cent of those practising had settled in small towns and/or

rural communities. These percentages compare favourably with those of other rural medical education programs.[129]

One characteristic common is the requirement to train in ambulatory care settings for an extended period of time. Training location has long been acknowledged as having an influence on medical students' career choices (e.g. Dunbabin et al. 2006[130]). Therefore, ambulatory rural training experience can increase the likelihood of students taking up a primary care career in rural areas. Dick et al. (2011) reviewed self-reported career plans at the time of graduation of 451 programme graduates.[131] Factors associated with an intended primary care career at the time of graduation were primary care track (OR 4.5, 95% CI 2.4–8.6) and a rural training experience (OR 2.1, 95% CI 1.3–3.4).

The literature is scant for urban underserved areas, but a small qualitative study on medical education in the Bronx area of New York city suggests that a training focusing on social medicine and community-oriented medicine is highly valued by students.[132]

In England, Health Education England regulates training posts nationally and ensures that there are adequate posts in underserved areas. For example, training posts in major teaching hospitals will typically involve rotations to less attractive regional hospitals. This may influence the number of doctors who choose subsequently to work in those areas following the completion of their training. England also introduced specific payments to attract doctors to underserved areas (mainly socio-economically deprived areas). These included a 'golden hello' payment of £7,000, which was offered to doctors moving into a deprived areas in the early 2000s (since discontinued).[133] A similar scheme is in operation in France.[114] It guarantees a minimum income for the first two years for a doctor practising in an underserved area. A further scheme provides income guarantees for up to three years in underserved areas.[134] However, early evaluation of these schemes suggests that the uptake by French doctors has been lower than expected.[135] Both England and the Netherlands have schemes that provide long-term additional income for doctors in underserved areas, England by weighting capitation payments to reflect rurality and socio-economic deprivation, and the Netherlands by providing income supplements in deprived areas. These are likely to be more effective at recruiting and retaining doctors in underserved areas than short-term schemes designed to attract doctors to move.[120]

Non-financial inducements may be offered as well as financial ones. Australia and Canada, for example, have introduced comprehensive personal and professional support programmes for doctors willing to serve in shortage areas.[136] These strategies can include assistance in finding housing, financial support for relocation, funding for continuing medical education, locum provision and the establishment of rural practice networks. In the Netherlands, proposals are currently being discussed to provide doctors training as GPs in less popular areas with subsidised housing. The provision of salaried posts in state-sponsored clinics, as an alternative to private practice, may be an additional asset, offering security of income and freedom from financial responsibilities. Programmes such as these are credited with maintaining a viable workforce in rural areas, but their cost-effectiveness has not been rigorously evaluated.[137]

Coercive strategies in general relate to student loan repayment in return for a period of obligated service in an underserved area, or a requirement on all immigrant doctors to work for a period of years in an underserved area. Scholarships may also be offered to doctors willing to work in very rural areas. For example, the Australian Medical Rural Bonded Scholarship programme offers scholarships in return for

six years of rural service after the completion of medical training.[138] France also has a scheme of student support, the *contrat d'engagement de service public* (CESP), a public service commitment contract), which requires students to provide care in underserved areas for as many years as they received allowances.[139] Although such schemes may be successful in providing short-term medical staffing, long-term retention of these doctors is relatively poor, with many returning to big cities once their obligated service is complete.[140]

The comparative cost-effectiveness of different incentives to staff underserved areas is largely unknown. What is clear, however, is that a wide variety of approaches exists, but that no one strategy is fully effective. It is likely that a blend of approaches, incorporating both pecuniary and non-pecuniary incentives, is most likely to be successful.

2.4. Options for the further development of medical education and training for primary care in Germany arising from this study

The overarching aim of this work is to help inform the further development of medical education and training for primary care in Germany. We have, in the preceding sections, provided a summary overview of general approaches to medical education and training, with a focus on general practice training in England, France and the Netherlands, with Germany included for comparison. For each country, we have explored the core elements of the education and training pathways, from admission to medical school to obtaining a specialist qualification in general practice, and we have discussed the governance and financing structures within which medical under- and postgraduate education and training are being delivered. We have further outlined approaches taken in a number of countries to ensure the provision and distribution of the primary medical care workforce nationally and regionally.

Many of the issues identified in this report have been recognised and are being addressed through a number of reform activities in Germany, in particular the challenges to attracting a sufficient number of medical students into general practice to meet the future healthcare demands arising from changing demographics and the associated growth in the burden of multiple chronic diseases. For example, the 2013 agreement of the new coalition government has made medical education and training a priority area, arguing for the better targeting of admission to medical school, the promotion of practical experience and the strengthening of general practice.[141] This is to be delivered through a 'Masterplan medical studies 2020', which is to be developed by a conference that brings together health and education ministries at the federal and state levels. The coalition agreement further foresees the support of postgraduate training in general practice to be increased by 50 per cent, and the possibility of its coordination at the national level. It also aims to strengthen training in what is being referred to as 'general specialist care' in the ambulatory care sector, which includes such specialties as surgery, paediatrics, gynaecology and ophthalmology, among others.

Medical education and training in Germany was also the subject of two major reports issued in 2014 by, respectively, the German council of science and humanities (*Wissenschaftsrat*, WR)[142] and the advisory council on the assessment of developments in the healthcare system (*Sachverständigenrat zur Begutachtung der Entwicklung im Gesundheitswesen*, SVR Gesundheit).[47] The report by the council of science and humanities analysed 'model courses' (*Modellstudiengänge*) in medicine and the extent to which these

experiences may inform the further development of undergraduate medical education in Germany. Based on its analysis, the report's key recommendations centre around the strengthening of integrated curricula that are patient-oriented; a focus on training that is competency-led and team-based; and an emphasis on general practice as a core part of the curriculum through, for example, the institutionalisation of general practice at medical schools.[142] A focus of competencies is also at the core of ongoing work led by the German Association for Medical Education (GMA) and the association of medical schools (*Medizinischer Fakultätentag,* MFT), which, in cooperation with a wide range of stakeholders, are developing a national physician competency framework, the '*Nationaler Kompetenzbasierter Lernzielkatalog Medizin*' (NKLM).[143] This framework seeks to define uniform and binding standards in medical undergraduate education. Its overarching aim is to arrive at a consensus that will provide a basis for teaching medicine within the framework of the existing Licensing Regulations for Physicians. The NKLM is anticipated to be finalised and approved in 2015.

Finally, the advisory council on health (SVR), in its 2014 report, emphasises a need for the further development of medical education and training in Germany in the context of a wider assessment of the healthcare system and its ability to ensure needs-based healthcare services in rural and underserved areas in particular.[47] Within medical education and training, the SVR placed particular emphasis on the strengthening of general practice along the entire pathway, with recommendations targeting both undergraduate and postgraduate training, from admission to medical school and increasing the role of general practice in undergraduate training, to the establishment of a coordinated and specifically (financially) resourced system of postgraduate training.

2.4.1. Medical education and training for primary care in Germany in an international context

Setting medical education and training in Germany in an international context, the work presented in this study echoes many of the ongoing activities and recommendations outlined above. Recognising the diversity of countries and that, in the context of this report, we assessed the general education and career pathways with a focus on general practice, a number of observations can be made on the extent to which medical education and training in Germany differs from that in the three comparator countries. We describe these differences further, while stressing that in doing so, we do not seek to attach a value judgement on any given approach or pathway, or imply that one is superior to the other. Indeed, such a judgement would not be possible given the lack of empirical evidence on the relative advantages and disadvantages of different medical education and training systems and the associated impacts on the quality of care and population health outcomes.

Reflecting on the entire pathway – from admission to medical school, through undergraduate medical education and training, specialist training in general practice, and obtaining the specialist degree – we observe a divergence between Germany and the comparator countries in three broad areas: (i) the framework for determining the number of students to be admitted to medical school and the number of places for and entry into postgraduate medical training; (ii) the involvement of medical schools along the entire under- and postgraduate education and training pathway; and (iii) the financing of postgraduate training in ambulatory care settings. We discuss these in turn.

Considering first the process of defining the annual number of students to be admitted to medical school, Germany appears to be the only one among the arguably small sample of countries considered in this study where this number is determined at the state rather than the national level, and without input from the health service, be it at the regional level, as in France, or at the national level, as in England or the Netherlands. This reflects the system of higher education in Germany, which is the responsibility of the 16 states, as set out in the constitution. Responsibility for the healthcare system, however, is shared among the federal government, the corporatist actors and the states.

Views on whether the process of admission to medical school in Germany should be amended vary among stakeholders, including those interviewed for this study (see Chapter 5, section 5.4). The current debate focuses mainly on criteria for admission rather than the annual number of students to be admitted, with for example the advisory council on health (2014) highlighting the possibility of placing more weight on aptitude and commitment to (future) practice in primary care among students applying to medical school.[47] The aforementioned 2013 coalition agreement also argued for the better targeting of admission to medical school, although it is not yet clear how this would look in practice.[141] The Council of Science and Humanities, in its 2014 report described above, noted that there was evidence pointing to the predictive validity of different approaches to student selection on successful completion of medical studies,[144] highlighting the role of the school leaving grade in particular.[142] However, it further highlighted that little is known about the degree to which different approaches to student selection impact on subsequent career choice in primary or specialist care. For this reason, the council does not currently recommend changing the admissions process, which emphasises the school leaving grade, but it does encourage medical schools to use existing opportunities to additionally target admission in line with the individual school's taught course and research profile.

Similarly, in the area of specialist training, England, France and the Netherlands each operate a national-level planning process that regulates entry into individual medical specialties. In France and the Netherlands, this is undertaken by the Ministry of Health, informed by regional (France) or national (the Netherlands) workforce planning, while in England, the number of places is determined at the regional level, but based on national workforce planning by the Department of Health. In all three countries, trainee selection is also coordinated nationally, and entry into (any) specialist training is on a competitive basis.

Conversely, in Germany, there is no planning of the number of specialist training places. Regarding training in general practice, a national agreement among the key actors (SHI funds and provider associations) foresees financial support for a minimum of 5,000 training places annually.[95] Furthermore, specialist training is not coordinated at the national level. Those pursuing specialisation have to organise the different rotations required for a given specialist qualification themselves, although postgraduate training networks are increasingly being established in general practice to facilitate rotation.

We have argued above that a national strategy or coordinating mechanism that defines the number of doctors entering training programmes for a given medical specialty may be an effective way to plan and regulate the entry of young doctors into different specialties. Based on medium- to long-term projections, such an approach would allow for balancing the number of required specialists in different medical disciplines and could reduce the impact of projected shortfalls in specific areas. This was demonstrated by

the experience of health workforce planning in the Netherlands, which is seen to have contributed to mitigating an estimated shortage of GPs over a period of 10 years.[49]

A national strategy that explicitly plans for the number of doctors entering specialty training as a means to direct the future balance of specialties in the medical workforce does not appear to be discussed explicitly in the German context. However, commentators have highlighted a need for better coordination of postgraduate training in general practice in particular.[86] A number of activities are underway to strengthen coordination. These include the establishment of coordinating points located at the state chambers of physicians that are tasked with the organisation and coordination of specialty training in general practice at the state level.[87] The advisory council on health (SVR), in its 2014 report, went further by placing calls for the targeted support of specialist training in general practice at the centre of its recommendations to enhance medical education and training.[47] It recommended the creation of a nationally coordinated approach that also involves dedicated financial resourcing (see below); the recommended approach foresees guaranteed posts for each trainee in general practice over the entire training period that are person-bound and that can be transferred when the trainee moves jobs during training. Such an approach, it is argued, would allow for a more predictable pathway in general practice training and enhance its status as a career option.

In this context, stakeholders interviewed for this study and elsewhere also highlighted that postgraduate medical training in Germany is almost entirely training on the job, as noted earlier,[145] with no formal taught course element.[86] This is in contrast to the three comparator countries, where medical schools are involved (to different degrees) in the delivery of the curriculum of postgraduate medical training. Furthermore, England and the Netherlands have also set up 'training institutes' that are linked to medical schools ('foundation schools' in England; general practitioner training institutes in the Netherlands). It is difficult, on the basis of the available evidence, to be certain that the capabilities and competencies of physicians undergoing specialist training with medical school involvement are different from those where medical schools are not involved, or that these result in differences in the quality of care provided. However, medical graduates pursuing GP specialty training in Germany have voiced concern about the lack of regular advanced training courses or seminars during training, which, they argue, are common for those training in hospital settings, and which would help ensure a minimum standardised knowledge base among GPs in training.[145] The SVR, in its 2014 report, recommended the strengthening of regional 'competence centres', currently established by a small number of medical schools in Germany that seek to provide training and mentorship opportunities for GP trainees and their trainers and to coordinate the training of GPs (see also Chapter 5, section 5.4). These centres, it argued, would provide networking and mentoring support for GPs in training who, because of the requirements set out in the regulations for specialty training in terms of skills and competencies to be acquired,[31] are required to change training posts more frequently than is the case for other specialities.[47] Such approaches, alongside the aforementioned coordinating points at the state chambers of physicians, might also helpfully address perceived concerns, among GP trainees, about professional isolation and requests for a structured mentoring programme.[145]

Our third key observation relates to the financing of postgraduate training. We found that all three comparator countries have set aside a specific budget to pay or finance trainees. In the Netherlands, a dedicated organisation, the foundation for vocational training of GPs acts as single employer of all GP

trainees. All three countries have mechanisms in place that, at the national level, ensure reimbursement of trainers (both at the undergraduate and postgraduate level). In Germany, there is commitment to the support of specialist training in general practice, as set out in legislation and subsequent agreements among the key stakeholders.[95 146] However, the 2014 SVR report highlights challenges in the implementation of the relevant stipulations in practice, which can lead to both interruptions in training and periods of unemployment, which in turn prolongs the time required to complete the training.[47] This, the SVR argued, would likely contribute to lower the attractiveness of general practice among medical students and reduce recruitment into this career path. In order to address this issue, the SVR recommended introducing a nationally coordinated financing mechanism that includes guaranteed GP training posts throughout the entire training period, as noted above.[47] The SVR proposed different ways through which such a mechanism could be funded, but stressed that it should be directed through an organisation or, similar to the Dutch model, a dedicated foundation at the national level, and independently financed through tax income rather than linked to the SHI system.

In summary, we observe that several components of the medical education and training system where Germany appears to diverge most from systems in other European countries are currently being considered by a number of proposals and recommendations put forward by various stakeholders in Germany. At the core of many of these proposals is a strengthening of general practice and the general ambulatory care sector more broadly, in response to the changing burden of disease and the health needs generated by these changes. In addition to approaches listed above, recommendations by the council of science and humanities and the advisory council on health (SVR) further include a range of measures within undergraduate education and training seeking to enhance the recognition of general practice as a core subject in medical practice, such as the introduction of a mandatory placement in general practice in the final practical year (proposed by the SVR) or the introduction of academic departments or institutes of general practice at all medical schools.[47 142] These measures regain urgency in the light of the most recent national survey of medical students in Germany of 2014, which illustrates the need for comprehensive measures to attract a sufficient number of medical students into general practice.[147] For example, over half of students thought that GP earnings are low; some 52 per cent also associated GPs in their own practice with professional isolation and 51 per cent said that GPs had to be available 24/7. At the same time, about half felt that general practice was interesting and varied, although some 20 per cent disagreed.[23 147] Among students in their final practical year, only just under 7 per cent had chosen general practice as their optional subject, and among those yet to enter the final year, only one-fifth said they would chose general practice, while just under half said they would not.

Importantly, the survey found that students' most trusted source of information about medical career was practising doctors (~75 per cent), and when asked about perceived image of different specialties among practising doctors, only one-quarter thought that general practice enjoyed high regard, while three-quarters thought it to be low. Conversely, specialties such as neurology (88 per cent), internal medicine (87 per cent) and surgery (75 per cent) were rated as highly desirable.[23] This suggests that there is a need for a multifaceted approach that in order to create an environment that is conducive to medical students gaining a positive experience of general practice during medical school early on that will likely influence their future career choice.[148 149]

3. England

3.1. Health system context

Healthcare in England is largely organised and delivered through the National Health Service (NHS). Health services provided by the NHS are funded through general taxation, with a small national insurance contribution. The NHS covers all residents, and health services are free at the point of use (with some exceptions, such as prescription drugs and dental care for certain groups of the population). In 2011, total health expenditure in the UK was 9.4 per cent of GDP. Some 83 per cent of total health expenditure was financed through taxation; voluntary health insurance accounted for 1.1 per cent; and just under 10 per cent was paid directly by the population (out-of-pocket payments).[150]

Following the 2012 Health and Social Care Act, the NHS in England has undergone considerable change, with reform implementation ongoing at the time of writing. While the Department of Health has remained the central government body principally responsible for setting policy for the health and social care system in England, from April 2013, its direct responsibility for the delivery of the NHS shifted to a newly established body, NHS England (also known as the NHS Commissioning Board).[151] NHS England is an independent body with executive powers; it shares, with the secretary of state for health, the 'legal duty to promote a comprehensive health service'.[152] NHS England has a wide range of statutory duties and is accountable to the secretary of state and the public; it oversees the delivery of NHS services.[33]

Most of the NHS commissioning budget is now managed by 211 clinical commissioning groups (CCGs), which are groups of general practices that come together in each area to commission healthcare services for their communities. These services include urgent and emergency care, elective hospital care, community health services, mental health services, maternity care, newborn care, and children's healthcare services, among others.[153] Clinical commissioning groups are supported by 19 commissioning support units. The commissioning of some specialised services, primary care, offender healthcare and some services for the armed forces is the responsibility of NHS England. Public health services are commissioned by the newly established Public Health England (PHE) and the local authorities, while NHS England commissions, on behalf of Public Health England, many of the public health services delivered by the NHS.

The provision of publicly financed NHS care is mainly through general practitioners (GPs) who are the first contact point for primary care and by salaried doctors and nurses in public hospitals providing secondary and tertiary care.[154] General practitioners act as gatekeepers to secondary and specialist care services. Some publicly financed care is also provided by private and voluntary providers.

3.2. Primary care

Most primary care healthcare services in England are provided by primary care teams, including general practitioners, nurses and other health professionals, usually in community-based GP practices or health centres. Most GPs are independent contractors, who are self-employed individuals or individuals who work in partnerships running their own practices as small businesses. Professionals directly employed by GP practices or who work in the community in collaboration with GPs include nurses, midwives, health visitors, managers, administrators and others involved with direct patient care, such as physiotherapists or podiatrists.

Most GPs are remunerated under the General Medical Services (GMS) contract, which is negotiated nationally between NHS Employers (on behalf of NHS England, which has responsibility for developing primary medical care contracts[155]) and the General Practitioners Committee of the British Medical Association. The GMS covers the core funding ('global sum') to general practices to cover the cost of providing routine primary care services to its registered list of patients; the Quality and Outcomes Framework (QOF), a voluntary pay-for-performance scheme covering clinical and public health; and enhanced services that practices can choose to provide.[156]

The core funding involves payments made to practices according to the needs of the patients, in the form of a capitation payment, distinguishing 'essential' and 'additional' services. Essential services comprise the management of patients, including the terminally ill, and the management of chronic disease. Additional services, which GP practices have the right to provide (and typically do provide) include cervical screening, contraceptive services, vaccinations and immunisations, child health surveillance, maternity services, and minor surgery services. The payment is essentially a capitation payment, which takes account of a set of determinants of practice workload, such as patient demographics, levels of morbidity and mortality, rurality, cost of living.[157] In 2012, just over half of GP practices held GMS contracts, covering 51 per cent of individual GPs.[155] About 40 per cent of practices held Personal Medical Services (PMS) contracts. Introduced in 1998, Personal Medical Services contracts (PMS) are contracts agreed between NHS England and individual GP practices. PMS contracts allow providers to negotiate a local agreement for the services they will provide and the payments they will receive, taking account of specific local healthcare needs.[158] Arrangements under PMS contracts are currently under review.[159]

The Quality and Outcomes Framework (QOF) was introduced in 2004 with the aim to increase quality of care by rewarding performance.[160] The QOF is based on a system of indicators developed since 2009 by the National Institute for Health and Care Excellence (NICE) and is updated every year. QOF indicators cover four main domains: clinical care (e.g. coronary heart disease, heart failure, hypertension), public health (e.g. cancer screening, contraceptive services), quality and productivity (i.e. organisational indicators), and patient experience (based around length of routine booked appointments). Quality of care is assessed against these indicators, and practices are rewarded financially based on the number of points they scored for each indicator.[160]

Established in 2008, enhanced services are defined as 'primary medical services other than essential services, additional services or out-of-hours services, or essential, additional or out-of-hours services or an element of such a service which requires an enhanced level of service provision'.[161] They are commissioned by NHS England nationally. They include clinical services, such as minor surgeries, but

also organisational features, such as extended hours access scheme. The QOF indicators and the list of enhanced services are revisited every year. Both QOF and enhanced services are available under the GMS and the PMS contract.

3.2.1. Characteristics of practices

In 2012, there were about 8,090 GP practices in England, with a registered patient population of 55.7 million.[158] The average number of registered patients per practice was 6,890. The number varied by region, with the highest number of patients per practice (8,760) in south-central England and lowest (5,993) in the north-west.[39] More than half of practices (57 per cent) had four or more GPs, while 18 per cent operated as single-handed GP Providers, that is, the GP works alone without other GP partners, although she or he might employ other GPs (only 10 per cent had one GP only). The average list size (number of registered patients) per practitioner under the general medical services (GMS) contract was 1,570.

Figure 3 shows the range of staff other than GPs working in GP practices. It shows that the number of full-time equivalent practice nurses has remained relatively stable since 2010, with 14,695 in 2012. Full-time equivalents of other staff involved in direct patient care (including healthcare assistants) have, however, increased considerably since 2010, by more than 18 per cent, to 8,327 in 2012.

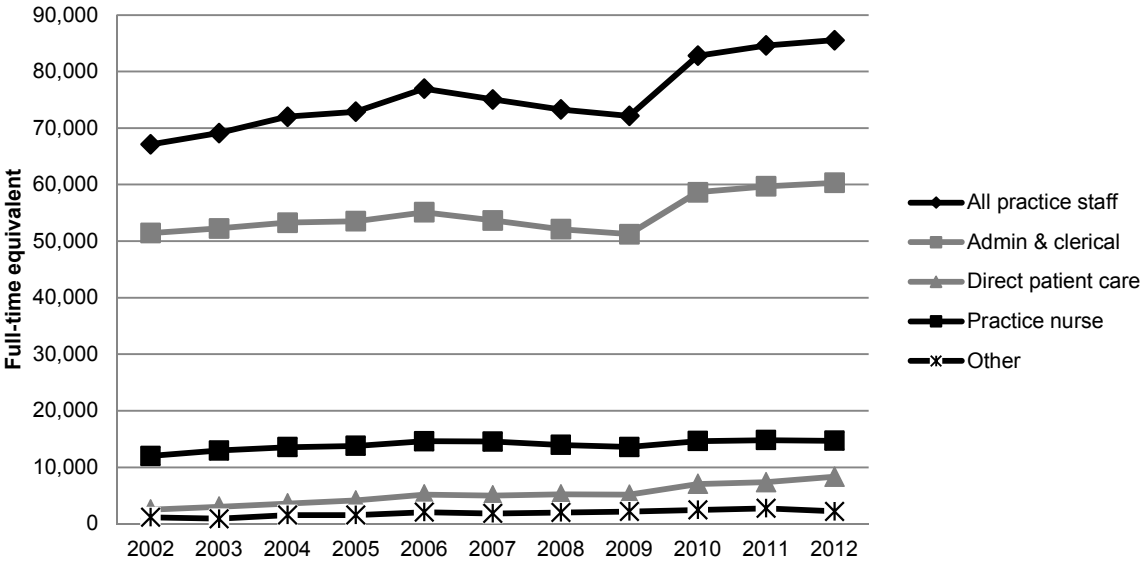

Figure 3 GP practice staff by type in England at 30 September 2012

Note: There was a change in data collection from 2010 onwards; data for 2010–2012 were collected at the practice level rather than the primary care trust level.

Source: The Health and Social Care Information Centre (2013)[116]

3.2.2. General practice workforce

The GP workforce has grown by 17 per cent (5,203 full-time equivalents) in the past decade, 2003 to 2013 (Figure 4).[39] The number of salaried/other practitioners increased by 7,441, to 9,153, in the same period, indicating a continuing tendency to work in general practice for a salary rather than as a partner since the introduction of the new GP contract in April 2004.[158]

Overall, however, the rate of growth has slowed from 2007 in comparison with that of consultants, where there was an increase of 43 per cent between 2003 and 2013.[113] The rate of increase from 2012 to 2013 was 0.1 per cent for GPs and 2.0 per cent for consultants.[39] Health Education England (see below) has identified a number of factors that will slow the growth of the GP workforce further; these include extended training, an ageing workforce and work–life balance factors for younger GPs. There is no national target for an increase in GPs, but there is consensus that a considerable increase is required. Health Education England are working to the assumption that they must ensure that 50 per cent of undergraduate medical students become GPs.[46] This growth target means ensuring 3,250 GP training places by 2015, with Local Education and Training Boards (LETBs, see below) proposing an additional 222 places compared with the number that would be required if no growth were planned.

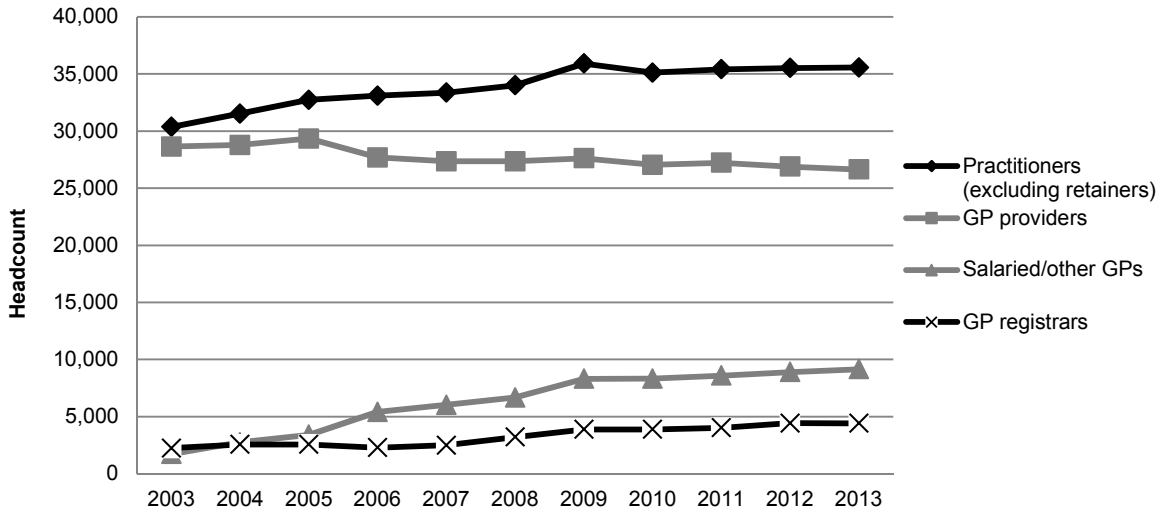

Figure 4 General practitioners in England, 2003–2013

Note: A new headcount methodology was introduced in 2010. Considered a more stringent count, it is not directly comparable with earlier years. 'Retainer' GPs are practitioners who are employed by a GP practice and who provide a limited number of service sessions in general practice (up to four sessions a week).

Source: Health and Social Care Information Centre (2014)[39]

The number of GP registrars has more than doubled, from 2,235 in 2002 to 4,404 in 2013, an average annual growth rate of 7 per cent. A growing proportion of GP registrars are female, and overall the majority of doctors under 30 years of age are women (61 per cent) reflecting a change in the gender balance of the workforce. Men still account for 72 per cent of doctors at the latter stage of careers, that is, those over 50 years.[158]

3.2.3. Distribution of GPs

The average number of full-time equivalent GPs per 100,000 population in England is 66.9, although there is considerable geographic variation, from 53 to 89 per 100,000 population. Rural areas tend to have higher rates of full-time equivalent GPs per population, while more urban areas tend to have lower rates. The lowest numbers are seen in the East Midlands and east of England.[39] These regions tend also to have poorer health outcomes, with higher all-cause mortality, mortality considered amenable to healthcare and years of life lost for men and women compared with other areas in England.[162]

There is similarly wide variation in the number of practice nurses per head of population, ranging from 0.16 to 0.41 per 1,000 population. Again urban areas tend to have lower numbers of practice nurses than do rural areas. The nature of practices also varies between urban and rural areas. Those areas that have a higher proportion of single- or double-handed practices tend to be urban.

3.2.4. Workforce policies for the provision of primary care nationally and locally

In England, responsibility for workforce planning and commissioning of training and education for all health professionals has recently been accorded to Health Education England.[163] This is the first time that workforce planning for all health professionals has been with one authority. Previously investment decisions were determined largely from the perspective of individual professions.[46] Health Education England was established as a Special Health Authority in England in June 2012. It took on some functions from October 2012 and assumed full operational responsibility from April 2013. It has a national function for planning and developing the whole healthcare and public health workforce and an explicit aim to promote high quality education and training that is responsive to the changing needs of patient and communities and delivered to standards set by regulators.[46] At a local level there are 13 Local Education and Training Boards (LETBs) that are responsible for training and education of NHS staff, clinical and non-clinical, within their geographic area. LETBs have the remit to improve the quality of education and training outcomes to meet the needs of patients, the public and service providers in their areas, and they are directly accountable to Health Education England.

In 2013, Health Education England (HEE) published the first national workforce plan for England.[164] With specific reference to forecasting future workforce requirements for GPs, the derivation of targets to date has been driven by supply side factors (e.g. retirement age, current workforce levels). Health Education England's expectation that 50 per cent of medical students will need to become GPs was informed by an in-depth review of GP workforce, undertaken by the Centre for Workforce Intelligence and commissioned by Health Education England, the Department of Health, and the Royal College of General Practitioners, among other stakeholders, before HEE assumed full operational responsibility for workforce planning.[165] The Centre for Workforce Intelligence is the national authority on workforce planning and development, which works to provide information and advice to the health and social care system. However, the centre sees that additional measures to improve workforce supply will also be needed, including measures aimed at making general practice a more appealing career choice for medical students.[165]

Incentives to encourage GPs to work in underserved areas

The way in which England has most systematically tried to improve recruitment and retention in underserved areas has been through financial incentives. In 1990 the General Medical services contract introduced extra capitated payments for each patient who lived in an electoral ward area designated as deprived. The payment formula was based on the Jarman underprivileged area index and aimed to compensate GPs for increases in workload.[166] This was criticised over time, and the new general medical services contract in 2004 introduced a new form of weighting to take account of differences in populations served and in area level adjustments, to, for example, reflect higher costs of practice in rural areas.[120] There appears to have been some dissatisfaction with the ways in which financial incentives

have been determined over time. Arguments for change in the formula used to determine deprivation payments have been ongoing, with further changes likely again from 2015.[167] A further incentive for GPs practising in remote and rural areas is that they can generate income through dispensing. Longstanding regulation has meant that rural GPs, typically defined by distance to nearest pharmacy, can apply to become dispensing practices and be paid a fee for doing so, although the level of this fee has decreased in recent years.[168] In 2012, 1,096 (13.6 per cent) of practices in England were dispensing practices.[39]

Other financial initiatives have included the NHS 'Golden Hello', which ran from 2001 to 2005 and offered a one-off payment (initially £5,000, rising to £7,000) to GPs taking up posts in underserved areas. These payments have since been discontinued.[133] In 2000, the NHS Local Improvement Finance Trust was set up with the aim of improving primary care estate and enabled practices in underserved areas, particularly inner city deprived areas, to access low cost loans.[120 169]

Finally, when the Personal Medical Services contracts (see above) were initially piloted, these were a means to create more flexible and attractive jobs initially to enhance recruitment to underserved areas. This strategy was successful initially, but then contracts were rapidly rolled out to all areas in England, reducing their potential to target recruitment in underserved areas specifically.[120]

3.3. Regulatory context for ensuring and improving the quality of primary care

The General Medical Council (GMC) is the independent regulator for doctors in the UK. It fulfils its roles by:

- Controlling entry to the medical register
- Setting the standards for medical schools and postgraduate education and training
- Determining the principles and values that underpin good medical practice and taking action when not met

Although health is a devolved matter within the United Kingdom, the GMC regulates all stages of doctors' education and professional development in the UK (England, Scotland, Wales and Northern Ireland). The GMC was established in the Medical Act of 1858 and has extensive legal powers to ensure the protection of patients from harm.

3.3.1. Licensing

To work in the UK as a doctor, either in the NHS or UK private practice, doctors need to be registered with the GMC and hold a licence to practise. The licence to practise gives doctors legal authority to prescribe and to sign certificates required for statutory purposes, such as death certificates.[170] This licence is generic to all doctors, irrespective of specialty. It is possible to be registered without being licensed, and doctors who do not work in the UK, or who do not undertake activities such as prescribing, do not need to hold a licence. In 2012, around 6 per cent (16,315) of the 252,533 doctors on the medical register in the UK did not hold a licence to practice.

3.3.2. Revalidation

The current revalidation system has been in place since December 2012. This is a process by which doctors are required to demonstrate on a regular basis that they are up to date and fit to practise. All licensed doctors have to revalidate, usually every five years. Revalidation involves an appraisal of the GP by a designated body. GPs are required to collect supporting information for each annual appraisal.[171] The appraisal is guided by a framework published by the GMC.[170] The framework is articulated around four main domains: knowledge, skills and performance; safety and quality; communication, partnership and teamwork; and maintaining trust.

3.4. Key components of education and training of medical doctors

3.4.1. Pathway for education and training for general practice

Figure 5 provides an overview of the training pathway for general practice in England, which typically takes 9 to 11 years from admission to medical school. The key components and main roles and responsibilities at each stage are outlined further below. The common elements of training for all doctors are the primary medical qualification/undergraduate degree and foundation years 1 and 2. The length of specialty training varies between general practice and other specialities (see below).

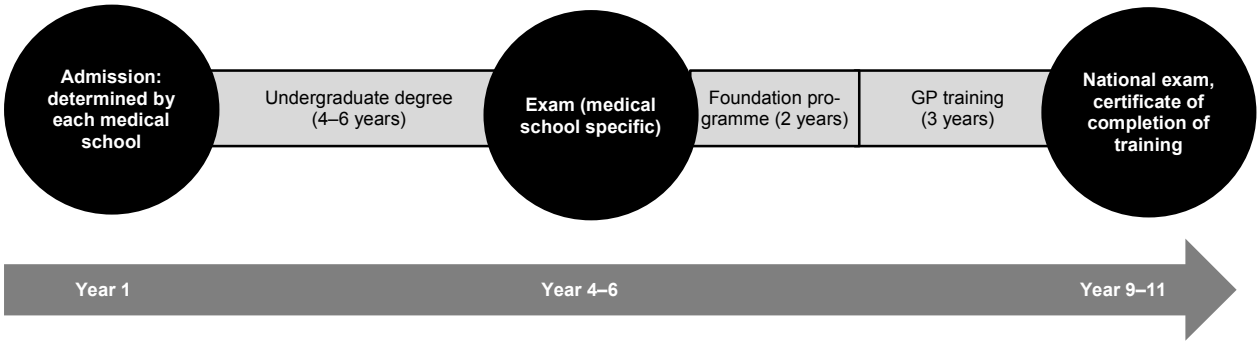

Figure 5 Medical education and training pathway for general practice in England

Note: The timings provided are indicative and assume no periods of absence or other variations.

Source: Adapted from Shape of Training (2013)[172]

Undergraduate training

Students must obtain a degree in medicine from a medical school. This typically involves a five-year degree programme, although four-year graduate entry programmes are also available. Six-year courses are available either to allow students the opportunity to obtain a related BSc or as part of widening access programmes. The GMC approves which medical schools are entitled to award Primary Medical Qualifications, or undergraduate medical degrees. There are currently 26 medical schools in England. *Tomorrow's Doctors,* most recently published by the GMC in 2009, is a key document to understand the standards and outcomes specified for admissions, curriculum and assessment throughout undergraduate training.[173]

Admission

Medical schools individually set criteria and processes for admission. They are accountable, however, to the GMC in ensuring that the process is fair, open and objective.[173] The Medical Schools Council also provides guiding principles for recruitment, which draws on *Tomorrow's Doctors* and the *Schwartz Report*, an independent review of recruitment across higher education in England.[174] It was clear from key informants that, within these guiding principles, that medical schools believe that it is important that admission requirements and procedures are set individually by medical schools, despite some calls to have a common entry standard (IntEN04). Medical schools may require prospective students to undertake standardised tests, such as the UK Clinical Aptitude Test (UKCAT) or Biomedical Admissions Test (BMAT), but the process and decision making is retained by the medical schools. The UK Clinical Aptitude Test aims to test aptitude rather than academic achievement, assessing a range of mental abilities and behavioural attributes considered important for doctors and dentists. The Biomedical Admissions Test is a subject-specific admissions test that assesses aptitude and skills and scientific knowledge and applications.[175]

The Department of Health and the Higher Education Funding Council for England (HEFCE) share responsibility for determining medical and dental school undergraduate intakes.[176] The Department of Health determines the overall numbers, and HEFCE determines individual distribution to medical and dental schools. From the late 1990s to 2005–2006, there were a series of measures to increase the annual intake of medical students through the establishment of new medical schools, an increase in overall intake and introduction of graduate entry courses.[176] The target intake for 2005–2006 to 2011–2012 remained constant, at 6,195 students in England, although this was exceeded each year by around 200–300 students. A review of intake published in 2012 then recommended a reduction of 2 per cent in medical schools annual intakes from 2013 and each year moving forward, although it suggested that this should be regularly reviewed.[52] The review group worked with the Centre for Workforce Intelligence to develop a robust model of the medical and dental workforce, although the inherent difficulties in predicting workforce requirements, particularly with an extensive training period such as medicine, was widely acknowledged.[177] The HEFCE can take action against institutions that exceed their intake, although there were different perspectives expressed from our key informants as to how much of a deterrent this was (IntEN01, IntEN03), but noted from different sources that pressure had increased in recent years and adherence had improved.[52] However, there are challenges of meeting an intake target from a medical school's perspective:

> That's [number of students] closely regulated, so all medical schools have a fixed number of students that they're permitted to admit and of course because of university students don't have to tell universities which place they're accepting until they make their one final acceptance; so there's always this business of cover ratio, where you have to offer more places than you actually have, otherwise you lose students who finally decide to go elsewhere; so it's a bit of a dark art, but universities seem to pull it off. So the numbers will vary a little bit each year, but there is a real problem if you overshoot your figures; in fact in recent years some schools have been doing that and came under considerable pressure not to. (IntEN01)

Equally the challenges of overrecruitment to those responsible for subsequent stages were apparent. Because there has been consistent oversubscription for Foundation Programme places (IntEN03), the government has had to create extra places to maintain its commitment that no eligible graduate from a UK medical school would be left without a foundation post.[178] It is important to note that, while there was a perception that overrecruitment at entry to medical schools is perhaps better contained, a number of private medical schools are anticipated to enter the market over the coming years, and they will not be part of the Department of Health– and HEFCE determined intake targets.

Curriculum

The requirements for undergraduate education are set out in *Tomorrow's Doctors*.[173] Medical schools are responsible for delivering a curriculum and means of assessment that meet the standards and outcomes in both *Tomorrow's Doctors* and the EU Medical Directive. The GMC defines the knowledge, skills and behaviours that students should learn at UK medical schools and specifies the outcomes that students should attain. For graduates these outcomes are specified under three domains:

(i) a doctor as a scholar and scientist
(ii) a doctor as a practitioner
(iii) a doctor as a professional

Each of these domains includes a number of outcomes. For example, a doctor as a scholar and scientist includes five separate outcomes, and most of these a multifaceted. The specification of outcomes means that medical schools have flexibility in how their curriculum is set and delivered.

Traditionally, there was a split between preclinical and clinical teaching in medical schools. Although some essentially retain this model, there has been growing emphasis, reinforced by the GMC, for students to have patient contact from an earlier stage in their undergraduate training. *Tomorrow's Doctors* specifies that the 'curriculum will include practical experience of working with patients throughout all years, increasing in duration and responsibility so that graduates are prepared for their responsibilities'.[173] All medical schools must adhere to the GMC's principles and meet quality assurance standards, but there can be considerable variation in the form and delivery of curricula at different medical schools. For example, some medical schools use problem-based learning and focus on delivering non-clinical material in the context of clinical practices. Others use systems-based integrated curricula, where clinical contact is introduced earlier and basic sciences may extend beyond the first two years. Again others retain a format that is essentially centred on the more traditional preclinical–clinical split.[179] One interviewee explained that there is increasing emphasis on earlier patient contact within the curriculum, as well as on the need for students to experience primary care as part of their undergraduate training:

> They don't have to, but all schools will have something like that [placement in primary care] because there is a big drive from the GMC that students understand and have experience of primary care in the community, because that's where most healthcare is delivered; that's where people live; so it would be a difficult task to explain why you wouldn't provide experiences in a primary care environment; and that theme runs through *Tomorrow's Doctors* very, very strongly; primary care is heavily represented in the curriculum, and the drive as come from the GMC. (IntEN01)

The publication and enforcement of the principles in *Tomorrow's Doctors* is considered to have had a major impact on curricula in the UK; on the proportion of teaching delivered by departments of general practice, primary care and public health medicine; and on the site of teaching, with increasing emphasis on community-based placements.[180] This having been said, there is considerable variation among medical schools in terms of career preferences of graduates. In a study published in 2011, only 11.9 per cent of graduates from Oxford or Cambridge stated general practice as their career of choice one year after graduation.[181] New medical schools (27.6 per cent) and medical schools outside London (23.3 per cent) seemed to have a greater proportion of graduates specifying general practice as their career choice. This may be because students recruited to such medical schools as Cambridge and Oxford have a stronger biological science orientation or because other medical schools, particularly new medical schools, market general practice more strongly as an attractive career choice.[182]

Tomorrow's Doctors also specifies the requirements of NHS organisations that have a responsibility to make available the staff, facilities and practical support to deliver the clinical aspects of the curriculum. In terms of exposure, this varies according to medical school. Changes in funding mechanisms have made it easier to recruit GPs to give time to undergraduate teaching (see also below). However, the system continues to rely on the enthusiasm of individual GPs to get involved. This can bring challenges for consistency in delivery of teaching and supervision and for the balance of quality assurance requirements with ensuring sufficient provision (IntEN01).

Assessment

Tomorrow's Doctors also sets out principles for assessment that medical schools have to follow, but again allows variation among medical schools. Essentially assessment has to ensure that graduates demonstrate all the 'outcomes for graduates' specified in *Tomorrow's Doctors*. Further criteria set by the GMC specify that assessments must be timely, valid, reliable, generalizable and fair; that students should be well informed about the nature of assessment; that examiners and assessors should be appropriately selected, trained, supported and appraised; and that assessment criteria should be consistent with requirements for competence standards set out in disability discrimination legislation.[173] Medical schools must be able to provide evidence for these and more detailed requirements. Medical schools also undertake their own internal quality assurance of assessments (see Section 3.4.4). There is no common final assessment or national assessment for medical graduates in England, although the role of a national assessment prior to registration with the GMC has been debated. Suggested benefits include that society can be reassured that all graduates have passed the same assessment, that patient safety can be enhanced and that such an assessment could be developed to be highly rigorous and reliable.[67] The Medical Schools Council has published a position paper outlining their objections to such a proposal, in which it argues that such an assessment would drive learning at the expense of other parts of the medical course, namely, of practicality and required level of resources to implement.[67] It was clear too from our key informants that medical schools wished to maintain autonomy in this area (IntEN01, IntEN03).

One of the current challenges in assessment is that medical students have to be ranked based on an Educational Performance Measure in order to be able to apply to the next stage of training, the Foundation Programme. The Educational Performance Measure is based on three components, but predominantly on performance at medical school. Medical schools assign students to appropriate deciles

according to a range of assessments.[183] The ranking provided my medical schools is important for students because a higher ranking typically means a greater likelihood of achieving their Foundation Programme of choice. Final examinations for medical schools are typically held in early summer, but because this is not in time to inform the ranking, performance in earlier assessments has to be taken into account. One of our key informants explained that this has changed the emphasis of what may have previously been formative assessments throughout the course, as these have had to take on greater summative significance (IntEN01).

Foundation training

Following graduation, trainee doctors undertake a two-year Foundation Programme. The GMC has responsibility for setting standards and outcomes for postgraduate education and training, including the Foundation Programme. These requirements are published in *The Trainee Doctor*.[78] The Foundation Programme curriculum was developed (with mapping to GMC criteria) by the Academy of Medical Royal Colleges, an umbrella body for 20 medical royal colleges and faculties across the UK and Ireland, and the Department of Health and equivalent bodies in the other constituent UK countries.[73] The latest Foundation Programme curriculum, published in 2012 and approved by the GMC, specifies that the broad aims of the Foundation Programme are to:

- Build on undergraduate education by instilling recently graduated doctors with the attributes of professionalism and primacy of patient welfare, which are required for safe and effective care of patients with both acute and long-term conditions
- Provide generic training that ensures foundation doctors develop and demonstrate a range of essential interpersonal and clinical skills for managing patients with both acute and long-term conditions, regardless of the specialty
- Provide the opportunity to develop leadership, team working and supervisory skills in order to deliver care in a setting of a contemporary multidisciplinary team and to begin to make independent clinical decisions with appropriate support
- Provide each foundation doctor with a variety of workplace experience in order to best inform career choice

Whatever career path is subsequently entered, the programme also specifies that all foundation doctors must have opportunities to understand community care provision and that the majority should be offered community placements.

Admission

As noted above, admission to Foundation training is a competitive process based predominantly on medical school performance. But it also includes points for other educational achievement, such as research publications. Applicants are also required to pass a situational judgement test. Using the nationally (UK-wide) coordinated online admissions system, applicants have to rank each unit of admission (foundation school or equivalent) by preference. The number of vacancies is determined by each Local Education and Training Board area based on workforce planning by the Department of Health. In some areas that are heavily oversubscribed, applicants are allocated in the order of their total application score. This means that higher-performing applicants are more likely to get their place of

choice and lower-performing applicants are less likely.[74] At the point of admission to foundation training, doctors have partial GMC registration.

Curriculum

The emphasis on community under the current programme aims represents a change and coincides with an increasing emphasis on long-term condition management. There is recognition that reaching the stage where all doctors undertake a community placement will take time. The target is to achieving it by 2017. One key informant explained that currently there is significant variation among Local Education and Training Board areas, partly as a result of funding:

> […] when it was introduced the… said there would be 100 per cent but the funding wasn't full and because for GP placements you need to have payment for the supervisors, that's the way that system works, so the amount of community placements in foundation varies significantly between [Local Education and Training Boards], North-west is at 100 per cent, we're about 42 per cent, and there are some that are 10 per cent or 20 per cent, so, yes, HEE [Higher Education England] said that from 2017, and, as I say, I think it's 70 per cent. (IntEN03)

In 2012, the proportion of doctors experiencing placements in general practice was 0.1 per cent in Foundation year 1 (F1) and 40.7 per cent in Foundation year 2 (F2) across the whole of the UK.[74]

The curriculum further specifies syllabus and assessment guidance, clearly highlighting the step up required from F1 to F2. The expected outcomes of foundation training are that F1 enables medical graduates to begin to take supervised responsibility for patient care and consolidate the skills that have been learnt at medical school and that F2 enables doctors to take on increasing responsibility for patient care, particularly in beginning to make management decisions. Foundation year 2 is also focused on further development of core generic skills and a contribution to education and training of the wider healthcare workforce, including nurses, medical students and less experienced doctors.[106] Satisfactory completion of F1 allows the relevant university or designated foundation school to recommend to the GMC that the doctor be granted full registration. At this point doctors are also able to prescribe medication. Satisfactory completion of F2 indicates that a doctor is ready to proceed to core, specialty or general practice training programmes.

Implementation

In both foundations years, training typically involves three four-month rotations in different specialties. There are small variations on this, with some areas also offering six- or three-month placements. However, in 2013, 91 per cent of F1 rotations and 97 per cent of F2 placements were taken as three four-month rotations.[172] Based on 2013 figures for the UK as a whole, the specialties experienced most by doctors in F1 are general surgery (79.6 per cent), general (internal) medicine (61.3 per cent) and geriatric medicine (24 per cent). In F2 these were emergency medicine (43 per cent), general practice (40.7 per cent) and trauma and orthopaedic surgery (21.2 per cent).[74]

Among key informants interviewed for this study, one of the perceived challenges in terms of attracting people to general practice training after foundation training was that doctors are required to apply for

specialty training early in the second year of their foundation training. However, as indicated by the figures above, most would not experience a rotation in general practice until some time during the second year. This is because doctors working in general practice would need to be able to prescribe medications, which is only possible after completion of Foundation year 1(IntEN04).

Assessment

Assessment for the Foundation Programme is outcomes-based rather than competency-based. The Foundation Programme curriculum specifies that formal assessment of progress should be made at the end of each placement and at the end of F1 and F2. The learning outcomes set in the curriculum (based on *The Trainee Doctor*) are set as a minimum standard, and many doctors are expected to achieve far more.[78] Assessments are conducted by clinical and/or educational supervisors, based on multiple sources of evidence, including feedback from senior doctors, team assessments of behaviour, engagement with supervised learning events, reflective practice throughout placements and satisfactory demonstration of core procedural skills as required by the GMC.[73] The assessment is facilitated through use of an e-portfolio.

A variant on the standard Foundation Programme, accounting for approximately 5 per cent of all foundation places, is the Academic Foundation Programme (AFP), which provides an opportunity for foundation doctors to develop research, teaching and leadership/management skills in addition to the competencies of the standard programme. The focus of Academic Foundation Programmes can vary considerably among areas. These programmes are typically co-ordinated by a local university, which gives Academic Foundation Programme doctors additional resources, such as research methodology, teaching and statistics courses, as well as the potential to get formally involved with teaching.[184]

Linkage between undergraduate education and further training

Key informants raised concerns in interviews about the lack of coordination and linkage between medical undergraduate education and training, for example, from undergraduate medical education to Foundation and specialty training. One example of this was that currently information about students does not follow them on to further training so that if problems have arisen or concerns been raised through undergraduate training, this is not known about. This was perceived as a missed opportunity and one key informant interviewed for this study suggested that training passports that follow students through medical school and subsequent training would be valuable (IntEN03). It was also felt that there could be greater linkage between provider organisations and those responsible for medical education to help ensure that graduating doctors better fit what the health service needs. The formation of Health Education England and role of Local Education and Training Boards in workforce planning were thought to be significant routes to try to address this (IntEN02). These key 'transitions' have received attention in the academic literature more broadly. It has been argued that these periods should be considered as critical learning periods and that experience varies widely with respect to support available or attention given to these periods.[185]

Mechanisms to attract doctors to underserved areas

Identifying mechanisms within education and training that could serve to attract doctors, and general practitioners in particular, to underserved areas was challenging. However, it was evident from the interviews with the key informants that there was some, if limited, scope for Local Education and

Training Boards, through Foundation and specialty training, to try to increase uptake of placements in these areas. Key informants reported that this could be done through ensuring that district general hospitals in peripheral areas and primary care practices in more disadvantaged communities could become training practices. This might involve financial support to bring premises up to the required standard for training. It was noted that attracting trainers was difficult (IntEN02, IntEN04). It was evident too that in the different regions, Health Education England were employing different strategies to ensure placement of trainee doctors in what would typically be considered less attractive areas and to ensure a fairer distribution, so that the highest-performing students do not just go the more popular areas. One region, for example, preallocates the bottom 10 per cent of applicants coming in to the foundation training programme across all the training programmes in the region, which ensures that there are some of the people who perform less well participate in the more popular programmes (IntEN02). It was evident that there is a balance to maintain in continuing to attract applications and managing to increase training opportunities in more deprived areas. One key informant reported that one region had deliberately invested more training funds in an area recognised as a 'black spot', but that this investment had instead resulted in a decrease in applications to the region as a whole (IntEN02). Our key informant gave a further example of how they are trying to place an academic clinical fellow in a less attractive areas, 'so what I am doing, effectively, is using workforce money to provide an additional year's training for one or two people within that programme, and the idea is that the presence of that will attract again better doctors into it' (IntEN02).

Specialty training

Following completion of the Foundation Programme, doctors typically move into specialty or GP training.

Admission

Since 2002, there has been a National Recruitment Office for General Practice training, which coordinates recruitment to general practice training programmes throughout England, Wales, Scotland and Northern Ireland.[76] The number of GP specialty training posts is negotiated between Local Education and Training Boards and the Department of Health. GP training applicants can apply to up to four preferred Local Education and Training Boards. Again, this can be anywhere in the UK. They then undertake a computer-based assessment as part of a short-listing method. Successful applicants are matched in rank order to their highest available preferred Local Education and Training Board. The application process is competitive, but of those applicants who are shortlisted, around 90 per cent are allocated to their first choice Local Education and Training Board.[76] As highlighted above, there is a recognised need to increase recruitment to general practice. Yet, at time of writing, 2014 recruitment had just been completed and there had been a 15 per cent decrease in the number of applicants compared with the 2013 figure (IntEN04).

In speaking to key informants, one of the overriding concerns was in how to attract doctors to general practice, rather than specifically how to attract them to underserved areas. The target of 50 per cent of medical students going into primary care was considered very challenging, particularly given reducing numbers of applications for GP specialty training. Although primary care was considered to be well

developed and well regarded in England compared with other countries (IntEN01), there were concerns with regards to the status and attractiveness of general practice. Key informants argued not only that there needs to be a fundamental change in the distribution of resources from secondary to primary care, but also that other aspects of general practice were deterring doctors, including:

- A lack of flexibility in training since the introduction of run through training which means that doctors have to decide early on and have little opportunity to change specialty.
- GP hours are not regulated like hospital doctor and trainee hours, and standard working days are very long, making the balance with family life particularly difficult
- General practice is perceived to have a negative media image (IntEN04)

Curriculum

The GMC has tasked the Royal College of General Practitioners (RCGP) with the responsibility for facilitating training for trainee GPs. Currently GP specialty training is three years in length, with a requirement to spend a minimum of 12 months of that time gaining general practice experience. The RCGP's curriculum defines the learning outcome for the specialty and describes competencies required to practice medicine as a GP within the NHS in the UK. The curriculum is structured around a core statement of being a GP, 4 contextual statements and 21 clinical examples.[186] On completion of training and if deemed competent, GPs are awarded a Certificate of Completion of Training (CCT) to signify that they have reached the competency levels required for independent, safe general practice. A prerequisite of a CCT (and full membership of the RCGP) is satisfactory completion of the Member of the Royal College of General Practitioners exam, which includes an applied knowledge test, a clinical skills assessment and a workplace assessment.[77] The MRCGP complies with the GMC standards on validity, reliability, feasibility, cost effectiveness, opportunities for feedback and impact on learning. After obtaining a CCT, doctors can apply to register on the GP register (specialists register on the Specialist Register). Since April 2006, the GMC has been required by law to maintain a register of all doctors working in general practice in the health service in the UK. This does not include doctors in training but does extend to locum doctors.[172]

The current programme of specialty training was reviewed by the RCGP in 2012, partly in recognition that the UK had the shortest general practice training programme of 14 European countries and that general practice was the shortest of all UK medical specialty training.[79] It also recognised the changing population health needs and the changing requirements for GPs that evolve from these needs. The review resulted in a proposal for GP training to be extended to four years, with a proposed educational model for enhancing and extending GP training in all four UK nations published in 2013.[80] Among key informants interviewed for this study, there was a view that any decision regarding extension of training would ultimately be determined by the availability of funding, and that, during a time of budget constraints across the NHS, this may be difficult (IntEN01, IntEN02, IntEN03).

Postqualification training

The RCGP has a dedicated support programme for newly qualified GPs called First5®. This programme is not compulsory. It provides a range of resources to newly qualified GPs around five pillars: facilitating

networks, career mentorship, supporting revalidation, continued professional development and promoting sense of belonging and representation within the professional college.

Key informants stressed that the move from training into independent practice was significant and that ongoing support postqualification was important:

> In terms of preparedness, I mean, I think all the surveys and things that ask people if they're prepared and they never feel prepared and, you know, that's understandable really because they've been in a very protected environment up until the point where they actually go into practice. So the numbers of patients that they see, the hours that they work, etc., are very tightly regulated and then they're going into a system where they're largely going to be self-employed and, you know, its hard work really. (IntEN04)

It was also reported that GPs are more likely to be subject to complaint or be referred in their first year of independent practice (IntEN04).

In England there do not appear to be specific training resources to support GPs in rural areas, but NHS Scotland provides a dedicated resource to remote and rural and island healthcare teams. It helps to support professional development (across the workforce) and to create communities of interest that may help to overcome potential isolation in such settings.[187]Scotland has also introduced a GP Rural Fellowship programme run by NHS Education Scotland. These fellowships are aimed at qualified GPs, typically newly qualified GPs, who wish to experience a year of rural practice, as part of a supported programme of education, practical experience and peer contact.[188]

Proposed changes to the education and training pathway

It is important to note that a recently published independent review of medical education and training in the UK has set out a framework for change that may impact on the pathway outlined above.[189] The review was jointly sponsored by the GMC, Academy of Medical Royal Colleges, Conference of Postgraduate Medical Deans of the UK, Health Education England, NHS Scotland, NHS Wales and the Northern Ireland Department of Health, Social Services and Public Safety, following a number of previous reports that had highlighted the need for change, in particular to make training more flexible and broad-based[190] and to take into account changing population needs. In summary, the proposed training structure will emphasise more broadly trained specialists, increased flexibility in training with options to move among specialties and increased emphasis on multi-professional working. Other changes in terms of the pathway that are recommended are that full GMC registration should happen at point of graduation from medical school rather than at the end of Foundation year 1, which will require graduates to be fit to work as fully registered doctors. Students and doctors will be required to follow patients through their entire care pathway as part of undergraduate and Foundation Programme training, and specialties will be more broadly defined and grouped according to patient care themes, for example, women's health and child health.[190]

3.4.2. Governance

The GMC regulates all stages of doctors' training and professional development in the UK. As described above, this is typically through setting key standards and outcomes required at each stage, for example, in key documents such as *Tomorrow's Doctors* and *The Trainee Doctor*.[51 78] The GMC then relies on other bodies to develop and deliver curricula, assessment, quality management and quality assurance, as described above. The main implementing bodies, as described in this chapter, are accountable to the GMC, although further bodies may be accountable to them.

3.4.3. Financing

Medical education in England is jointly funded through the Department for Business, Innovation and Skills and the Department of Health.[88] Funding is channelled through the Higher Education Funding Council for England and the NHS to medical schools and takes the form of a grant allocated to each medical school, the size of which is determined by the target intake. In addition, medical schools in England charge tuition fees of £9,000 per annum, which is the current cap for university tuition fees in England.

Funding arrangements are in place to ensure payment of providers in the NHS who deliver undergraduate education. The Service Increment for Teaching (SIFT) is NHS funding to offset costs of providing teaching, primarily through clinical placements. It had previously only been for secondary care, but now covers general practice, a change that, our key informant noted, has made a material difference in getting GPs involved in undergraduate teaching (IntEN01). The SIFT payment is made to practices rather than individuals and is designed to compensate for loss of service incurred through teaching.[89] Rates are negotiated between medical schools and Local Education and Training Boards. The SIFT has a historical basis from the 1970s, which means that levels of funding per medical student vary across England. This has raised concerns about lack of transparency and the SIFT payment system is currently being reviewed (IntEN01).[191] SIFT is one element of an overall multi-professional education and training budget allocation from the Department of Health that is allocated through Health Education England.

Postgraduate (foundation and specialist) training is funded by the Department of Health through Health Education England. With an annual budget of around £5b, Health Education England is a major training organisation. It is responsible for training across the workforce, but a significant proportion of the budget, allocated through Local Education and Training Boards, is for doctors' salaries while they are undertaking foundation and specialty training. The way in which funding is allocated for GP training is distinct from payments in secondary care. A set of directions dating back to 1976 determines salaries, training grants and other elements of GP training (IntEN03). Because GPs have to spend time in hospital and general practice, they may be employed by one or two trusts and one or two general practices over the course of their training. This in itself introduces further costs, as each employer would require necessary checks and employment processes as well as doctors' time. As a result, there is a move to nominate a lead employer so that trainees have a single three-year contract to cover their period of training, although this is not necessarily straightforward (IntEN03). It was regarded across interviews that GPs had to be driven by interest to serve as GP trainers and that payments were not financial incentive enough (IntEN02,

IntEN04). Further advantages of hosting GP trainees are that it is an important source of recruitment to general practice.

Funding for continuing professional development is the responsibility of employers or individual doctors.

3.4.4. Quality assurance

The GMC has a statutory responsibility for quality assurance in undergraduate and postgraduate education. Quality assurance is seen as the overarching activity within which quality management and quality control sit and for which the GMC works with other organisations. The responsibility of the GMC is thus to ensure that policies, standards, systems and processes are in place to maintain and improve the quality of medical education and training.[192] A Quality Improvement Framework sets out the requirements of quality assurance to ensure consistency and transparency, yet is designed to enable flexibility to suit individual medical schools and Local Education and Training Boards.[60] The framework specifies three levels of quality assurance (
Table 10).

Table 10 Overview of quality assurance levels and responsibility for medical education and training in England

Level of quality assurance (responsible organisation)	Definition of level of quality assurance	Summary of responsibilities and standards
Quality assurance (GMC)	Includes all policies, standards, systems and processes in place to maintain and improve the quality of medical education and training	GMC responsibility covers three areas: (i) bodies responsible for medical education and training locally (including medical schools and Local Education and Training Boards); (ii) training posts and programmes (Foundation and all specialties, including GP); (iii) curricula and assessment underpinning training programmes (Foundation and all specialties, including GP)
Quality management (medical schools and Local Education and Training Boards)	Arrangements through which a medical school or Local Education and Training Board satisfies itself that local education providers* are meeting GMC standards	Medical schools are responsible for educational governance of university and local education provider based undergraduate education. Curricula and assessment are reviewed against standards and outcomes in *Tomorrow's Doctors*.[51] Local Education and Training Boards (previously: deaneries) are responsible for education governance of all approved foundation and specialty programmes, including GP programmes. Assessed against standards and outcomes in *The Trainee Doctor*.[78]
Quality control (Local Education Providers [LEPs])	Arrangements through which Local Education Providers ensure that medical students and medical trainees receive education and training that meets local, national and professional standards	Local Education Providers must demonstrate how GMC standards are being achieved; medical schools and Local Education and Training Boards have to support Local Education Providers to do this and to ensure consistency across specialties and different providers

Note: *Local Education Providers (LEPs) include NHS trusts and other provider organisations that host medical students and trainee doctors.
Source: General Medical Council (2010)[60]

The GMC set out four elements to the quality improvement framework: (i) approval against standards; (ii) shared evidence; (iii) visits, including checks; and (iv) responses to concerns. The GMC has a range of activities through which it conducts quality assurance. For example, with respect to whether medical schools and Local Education and Training Boards are meeting required standards it does the following:

(i) Medical schools and Local Education and Training Boards submit reports to the GMC setting out their activity against the relevant standards, outcome and requirements
(ii) The GMC carries out routine visits to medical schools and Local Education and Training Boards
(iii) The GMC carries out 'triggered visit' or other responses to concerns where necessary
(iv) The medical royal colleges and faculties submit annual summary reports to GMC to confirm that curriculum and associated assessment systems continue to meet GMC standards and requirements
(v) The GMC carries out national training surveys every year and examines other evidence sources where available to confirm that standards are being met
(vi) The GMC re-approves curricula and associated assessment systems

The range of quality management that medical schools may undertake locally includes peer review of medical curricula and assessment. This is where professionals from other medical schools may act as external examiners to programmes or come in as 'critical friends' (IntEN01). With regard to quality control of GPs providing training as part of undergraduate programmes, there are again a range of activities that medical schools may undertake, including student feedback (which can then be mapped to curricula and learning outcomes); inspection of practices; and setting minimum requirements for GPs, for example, regular attendance at meetings (IntEN01). One of the challenges is that for any one medical school there may be large number of GP practices taking students, so there is a balancing act between rigour and practicability.

Local Education and Training Boards are responsible for quality management and control during postgraduate education and training. Again a range of evidence is used, including national trainee and trainer surveys; local surveys conducted at the end of different clinical rotations; and audits of process outcomes of inter–Local Education and Training Board transfers, less-than-full-time training and trainees in difficulty.[60] For local education providers, Local Education and Training Boards also implement a programme of visits to providers, which can be used to facilitate better partnership working but also to provide approval and re-approval information for the GMC for general practices. Local Education and Training Boards are also likely to routinely collect a range of data to monitor outcomes as well as such issues as equality and diversity. Such data may include assessment results, attrition rates and inter–Local Education and Training Board transfers.[60] Our key informants also explained that elements of quality assurance for specialty training, such as the annual review competence progression system, are now also being introduced into the Foundation Programme (IntEN03).

With regard to quality assurance and GP specialty training, the GMC maintains a register of GP trainers but relies on Local Education and Training Boards to undertake the assessments and make recommendations. One key informant interviewed for this study argued that the biggest variation in GP training is in how the GP approval process works among Local Education and Training Boards. A single

operating system may be introduced in the future. All trainers must work to *The Trainee Doctor* standards,[51] but the degree to which Local Education and Training Boards undertake regular visits varies. Self-assessment is also an important source of evidence (IntEN02). Several Local Education and Training Boards, but not all, now require that trainers hold a postgraduate certificate in medical education, where previously they would only have been required to attend trainer workshops. There is also a requirement that trainers have at least three years' experiences postqualification as a GP (IntEN04). From summer 2014, the GMC will require a list of all GP trainers, including undergraduate tutors, to be maintained. This is likely to lead to a common approval process for both undergraduate and postgraduate tutors (IntEN03).

3.5. Stakeholder views on the current system

When asked how well the current medical workforce meets the changing needs of the population, there were mixed feelings among our key informants. Generally there was an impression that medical education had progressed significantly in the past 10 to 15 years in terms of increasing focus on patient care and contact with patients from a much earlier stage in undergraduate programmes. There was also thought to be more emphasis on multi-professional working, management and teamwork, all of which are recognised as key skills for working in the NHS. General practice training in particular was thought to be strong in terms of the emphasis given to communication skills. This said, within general practice in particular, the increasing complexity of cases managed in primary care was seen as being very challenging and a reason for the push to extend training to four years (IntEN02, IntEN04). The push comes at a time of great cost containment in the NHS, however, and the need to consider the whole workforce in meeting the needs of the population was highlighted. The other main issues highlighted by informants included that much of the challenge was in recruiting doctors to general practice as a whole, rather than just underserved areas, as outlined above. They expressed the need for a fundamental reallocation of resources within the NHS, from hospital to primary care, and said that without this reallocation, the expected workforce changes and increased recruitment to primary care would pose a challenge.

A further particular challenge that was highlighted for England was devolution. Among the organisations we have mentioned, some have an England-only remit, whereas others, such as the GMC and Royal College of General Practitioners, cover the whole of the UK. At a time when much focus has been on standardisation, this discrepancy in geographic remit was seen as creating additional challenges. For example, the Committee of General Practice Education Directors has maintained a UK-wide perspective. Its aim is to maintain equal standards in general practice education across all four countries, whereas the funding available and needs of the populations may vary considerable among these countries. Also, while England has supported an extension to GP training for four years, Wales and Scotland have rejected this (Scotland already has four, but two are in a hospital setting), which makes it quite difficult to reconcile and proceed (IntEN03). Similarly, the recently published *Shape of Medical Training* report[189] (see above) which is likely to impact the nature of medical education and training in years to come, was commissioned by responsible bodies across the UK but will need to be implemented differently within the four constituent countries. This may create further complexity.

4. France

4.1. Health system context

The French health system is based on statutory health insurance and provides all residents with health coverage, as per the 1999 universal health coverage act, the *Couverture maladie universelle* (CMU).[193] In 2012, SHI accounted for 71 per cent of health expenditure, complemented by taxation (5.9 per cent), out-of pocket payments (7.4 per cent), private health insurance (14 per cent) and corporations (other than health insurance) (1.9 per cent).[34] In the same year, national health expenditure was 11.7 per cent of GDP.

The Ministry of Health principally oversees overall health sector planning and guidance on health policies. The regions, represented by regional health agencies (*Agence régionale de santé*, ARSs), have an increasingly important role in the planning, delivery and financing of healthcare services, together with public health programmes at the regional level. Established in 2010[194], the regional health agencies are responsible for health and social care, public health, and care for the elderly. As they coordinate these sectors, the agencies have to ensure that healthcare provision meets the needs of the population while respecting national health expenditure objectives.

Under SHI, patients are entitled to access a comprehensive set of healthcare services, including hospital care and treatment in public or private facilities providing healthcare, rehabilitation or physiotherapy; outpatient care; diagnostic services and care; pharmaceutical products, medical appliances and prostheses prescribed and included in the positive lists of products eligible for reimbursement; and prescribed healthcare-related transport.[54]

4.2. Primary care

Until recently, the term 'primary care' was not commonly used in France.[195] Instead, and similar to Germany, the range of services delivered outside hospital was described under the umbrella term 'ambulatory care'. This includes care provided by general practitioners and specialist doctors, as well as nurses, physiotherapists, and dentists. Ambulatory care providers are free to establish their practice anywhere in the country, and until recently patients could access any type of ambulatory care provider directly, without referral and without being registered with a practice. However, following the health insurance reform act of 2004[196], a series of changes in the status and mission of primary care providers have reinforced the notion of primary care within ambulatory care. Subsequently, the 2009 hospitals act formally recognised the role of primary care providers as coordinators of the patient pathway.[54]

The 2004 health reform targeting the regulation and financing of healthcare, introduced a form of gatekeeping through the 'preferred doctor' (*médecin traitant*) scheme in the ambulatory care sector. Thus, since 2005, residents in France have been encouraged to sign up with their 'preferred doctor' as their first point of contact with the healthcare system.[54] The doctor chosen may be a general practitioner or a specialist; by 2007, 99.5 per cent of 'preferred doctors' were GPs.[197] There are considerable financial incentives for patients to join the scheme because patients who choose to directly access a specialist without a referral from their preferred doctor will be reimbursed by only 30 per cent of the costs by their SHI fund. Those committing to see their preferred doctor first and consult specialists upon referral receive a reimbursement of 70 per cent of costs.

The uptake of the preferred-doctor scheme has been high. About 85 per cent of patients had signed up with a preferred doctor by the end of 2008,[35] with some believing it to be compulsory.[198] Those who had a regular family doctor before the reform were more likely to opt for the scheme than those who did not. The remaining patients tended to be younger and have higher levels of education. Early assessments of the scheme found evidence of a change in patients' modes in accessing specialist care, with the proportion of those directly accessing specialists (excluding those who can be accessed directly without incurring surcharges) without referral falling from 22 per cent in 2004 to 15 per cent in 2006.[199] At the same time, the number of specialist consultations resulting from referrals from GPs increased from 39 per cent to 45 per cent.

General practice as a specialty

In France general practice refers to medicine practiced by primary care doctors. A reform of medical education in 1982 defined general practice as a non-specialty.[200] Since then, GPs, through professional associations (e.g. the trade unions *Confédération des syndicats médicaux français* (CSMF) and *Syndicat des médecins généralistes* (MG France)) have been the main driver of the change in the status of general practice.[201] Among other demands, GPs wanted to be able to invoice specialist consultations in the same way as other medical specialties (e.g. dermatology, ophthalmology).[202] After years of lobbying, practising GPs were able to retrospectively become specialists under certain conditions, and changes were progressively introduced into the curriculum; general practice became a specialty by law in 2002.[203] The specialty degree (*diplôme d'études spécialisées* (DES) in general practice) was created in 2004, and from 2004 students wishing to specialise in general practice had to undertake the same national ranking exam (*Epreuves Classantes Nationales*, ECN) as specialists in other disciplines.[29] In 2009, the creation of general practice departments in universities, the *filière universitaire de médecine générale* (FUMG), further advanced general practice by formally allowing the recruitment of lecturers and professors specialised in this specialty.[194]

Payment of doctors in the ambulatory care sector

Providers in the ambulatory care sector are reimbursed on a fee-for-service basis, with fees set nationally, based on agreements (*conventions*) between professional organisations and the SHI administration. GPs (and specialists) practice in three *secteurs.* The *secteur* determines the level of fees covered by the SHI:[204]

- *Secteur 1*: Fees are set by the SHI and doctors benefit from payment towards their social contributions and pension.

- *Secteur 2*: Doctors may charge patients beyond the statutory tariff, with moderation ('avec tact et mesure').
- *Secteur 3*: Doctors practice outside the SHI and patients have to meet the costs of treatment almost completely.

The statutory tariffs per service set by SHI are covered in two lists, the general nomenclature of medical procedures (*Nomenclature générale des actes professionnels* [NGAP]), for clinical procedures carried out by doctors, dentists, midwives and ancillaries, and the common classification of medical procedures (*Classification commune des actes médicaux* [CCAM]), for technical procedures delivered by doctors.[54] The NGAP was partly replaced by CCAM from 2005 and it is anticipated that the CCAM will entirely replace NGAP in the long term.

In 2010, about 25 per cent of physicians were practising in *Secteur 2*, that is, charging patients on top of the prices set by the SHI. This proportion was higher among specialists (40 per cent, compared with just over 10 per cent for GPs).[205] Concern has been expressed over the increase in the number of doctors practising in *Secteur 2* and its negative impact on access to care for patients,[206] although this was not considered an issue for GPs, considering the smaller proportion of *Secteur 2*.[207]

There have been concerns about the principal payment system, which is based on fee for services, and the incentives resulting from this approach. New payment methods have been introduced, including a capitation system to pay for doctors' management of patients with long-term conditions (*affectations de longue durée*, ALD) (€40 per patient per year) and for doctors or nurses who are involved in a provider network that coordinates service provision of a range of health professionals for a given patient. Since 2009, GPs can also enter into individual contracts with the SHI to receive additional payment in compensation for 'practice improvements'.[54] These contracts *Contrats d'amélioration des pratiques individuelles*, CAPI) aim to encourage GPs to strengthen preventative services, improve treatment of patients with a range of chronic conditions and increase the rate of generic drug prescribing. This additional payment is calculated based on the size of the population served by the GP and a range of performance indicators. From 2012, the scheme, renamed remuneration based on public health objectives, *Rémunération sur objectifs de santé publique*, ROSP) has been expanded to also include specialists; it sets objectives with indicators in four areas: practice modernisation, chronic disease, prevention and efficiency.[208]

4.2.1. Characteristics of practices

General practitioners, as the main providers of ambulatory primary care, constitute the first point of contact for a person seeking advice on, or treatment of, a health concern, and they provide continuous access to general medical care for common conditions and injuries. In 2013, the majority of GPs worked exclusively in private practice as self-employed professionals (59 per cent). A further 34.5 per cent were salaried, working in health centres or hospitals, and 6.3 per cent combined the two types of activities.[38]

Among GPs working in private practices, 54 per cent were working in group practices in 2009 (rising from 43 per cent in 1998).[40] Group practice can be defined 'as an office-based practice composed of at least two general practitioners sharing the same premises'.[40] By working in group practice, GPs share investments (capital for premises, employing an administrator, etc.) but not patient lists.[54] In 2009,

three quarters of GP group practices were composed exclusively of doctors (self-employed GPs or self-employed GPs and specialists).[40] These practices were small: in 2011, fewer than 10 per cent of the 35,248 GP practices had more than 5 salaried employees.[41] Of these employees, 95 per cent were women, who mostly worked as medical secretary. The remaining 25 per cent worked in multidisciplinary group practices involving at least one paramedic professional. These practices tend to be larger, with only 0.4 per cent comprising fewer than 3 professionals and a similar proportion (between 8 and 14 per cent) employing between 3 and 10 professionals.[40]

Most of the GPs' activity comprises office-based consultations, with 90 per cent of consultations attended by the patient. The remaining 10 per cent constitute home visits.[209] GPs may also voluntarily participate in the delivery of on-call care.[210] An average consultation lasts about 16 minutes (30 minutes for home visits).[211] Patients in France have an average of four contacts with a GP per year (they can visit several GPs).[209] General practitioners have an average of 800 patients registered on their list through the preferred doctor scheme.[212] In one year, a GP carries out around 5,000 consultations and visits.[54]

Recently, increasing attention has been paid to challenges associated with operating a private practice. Burn-out and exhaustion have been identified as growing issues that can have dramatic consequences on the health of the medical workforce and on the quality of care provided,[213] and these concerns are widely relayed by the media. There are reports that a small number of GPs (just over 900 in 2010) have taken early retirement or moved from self-employment to salaried positions as a consequence.[214]

4.2.2. The primary care workforce

In 2013, the average age of GPs was 52 years. Some 65 per cent of GPs were over 50 years, and 25 per cent were likely to retire within 5 years, while fewer than 8 per cent were starting their career (under 40 years of age).[38]

As mentioned above, the majority of GPs work exclusively in private practice as self-employed professionals, and 34.5 per cent are salaried. Salaried employment is more common among women, at 49 per cent, compared with men, at 24 per cent. Women are also more likely to work part-time.[211] Currently, 42 per cent of the workforce is female.[38] In 2013, women represented 58 per cent of the newly registered GPs, and this proportion is estimated to rise to 60 per cent in 2018.[38]

4.2.3. Distribution of GPs

During the past 30 years, the number of GPs has steadily increased, particularly so during the 1980s and the early 2000s, with some stabilisation of the trend more recently. This follows changes in the number of students admitted to medical schools[207], with a deceleration of growth observed since 2006–2007.[81]

In early 2013, the average regional density was 138.6 GPs for 100,000 inhabitants. However, there was some variation across the country, ranging from 115 GPs/100,000 in the Centre region to 162 GPs/100,000 in the south-east, and from 101.6 in Eure to 207 in Hautes-Alpes at the sub-regional (*département*) level.[38] Furthermore, there was a clear divide between the south and the north of the country, with southern regions benefiting from a higher density compared with the rest of the country, where there was a mix of average and low density.[38]

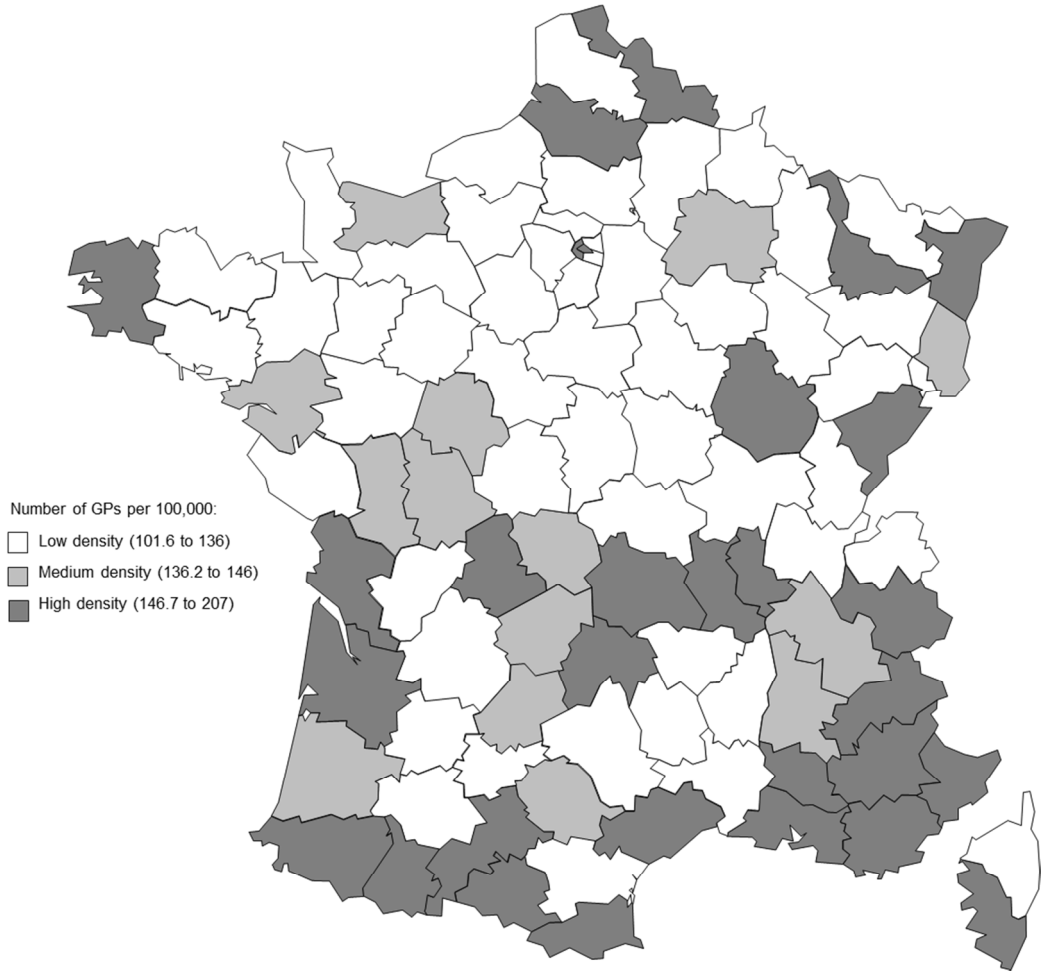

Figure 6 Number of GPs per 100,000 population by region, France, 2013

Source: Adapted from Le Breton-Lerouvillois (2013)[38]

In 2009, it was predicted that the number and density of GPs would fall steadily until 2022 before increasing again progressively.[215] This projection was corroborated by more recent projections, which predict for the number of GPs in 2018 to be 9 per cent lower than in 2007, whereas the number of specialists is projected to increase by 10 per cent during the same period.[38] A decrease in the number of GPs is anticipated in the next five years in more than 80 per cent of departments, with a maximum for Ile de France, projecting a decline of 10 per cent.

Over the past 20 years, inequalities with regard to the distribution of GPs across the country have narrowed. Between 1990 and 2012, the Theil index, which measures regional inequalities, halved.[216] However, projections anticipate that in the mid-term the trend could be reversed and that by 2030, regional inequalities in the density of GPs could reach levels similar to those seen in the 1980s.[215] Furthermore, inequalities across departments within a same region are currently larger than inequalities across regions.[216]

Medically underserved areas, defined as areas that combine a very low GPs density and a high levels of activity[217] represented 2.6 million residents (4 per cent of the population and 3 per cent of GPs).[54] In a study that examined the relationship between proximity of primary care provider and accessibility of

primary care services, Barlet et al. (2012) showed that, in 2010, 84 per cent of the population had access to a GP locally, and 100 per cent of the population had access to a GP in a locality within a 15 minute drive.[209] However, for 7 per cent of the population, accessibility to a GP was only half the national average.

4.2.4. Workforce policies for the provision of primary care nationally and locally

Numerus clausus

The *numerus clausus* is the main tool to regulate the medical workforce in France.[215] Since 1971, the *numerus clausus* determines the number of places available in medical schools.[54] It is defined at the national and regional levels as the number of places that is attributed every year to each specialty in each medical school. At the national level, this is undertaken by the general directorate of healthcare supply (*Direction générale de l'offre de soin,* DGOS) at the Ministry of Health, in collaboration with the Ministry of Higher Education.[218] Their decision is informed by the recommendations of a range of stakeholders, including the national observatory for healthcare providers demography (*Observatoire national de démographie des professions de santé,* ONDPS)[219] and the respective regional health agency which each develop a regional plan of care organisation, known as *Schéma régionaux d'organisation des soins* (SROS), in collaboration with local stakeholders.[220]

The three main criteria determining the *numerus clausus* are:[218]

- Number of students and places available in each medical school in previous years
- Availability of services in the regions (number and age of GPs)
- Teaching and support capacity in universities and hospitals

The *numerus clausus* can indirectly contribute to the redistribution of care supply across the country by allocating a maximum number of general practice positions by medical school. For instance, between 2011 and 2012, the *numerus clausus* for general practice decreased by 9.85 per cent at the national level.[218] However, the national number can hide large variations among regions: over the same period (2011–2012) changes in the number of general practice positions varied from -51 per cent in Besançon to +8 per cent in Ile-de-France.[218] Despite regional variations, the effect of the *numerus clausus* is believed to have remained limited in terms of distribution of GPs as there is no policy limiting the choice of settlement once GPs are qualified.[221] However, on average, 76 per cent of GPs start their practice in the region where they initially register.[38]

Incentives to encourage GPs to work in underserved areas

Three financial incentives have been developed and implemented at the national level to influence the geographic distribution of primary care providers, although these schemes are still recent and apply to only a small minority of doctors.[135]

The first scheme targets medical students. The public service commitment contract (*contrat d'engagement de service public,* CESP) was created by the 2009 hospitals act.[194] Under this contract, medical students can receive a monthly allowance during their studies starting from the year 2. In exchange, they commit to deliver care in an underserved area for as many years as they received allowances.[139] A list of

underserved areas is available online for students to choose from. This incentive is not limited to general practice students.

The second scheme creates a status of territorial general practitioner (*praticien territorial de médicine générale,* PTMG for those who have been practising medicine for less than a year, aiming to encourage young GPs to set up their own private practice. For a period of two years, and provided that the newly settled GP realises a minimum of 165 consultations per month at the *Secteur 1* rate in underserved areas, the status guarantees a minimum wage of €6,900 per month before tax and offers sickness leave and maternity leave, as well as support from the regional health agency in terms of office space. In 2013, 200 places were available under this scheme[114].

The third scheme targets registered GPs, offering them benefits from variations in the GP contract. Two options incentivise the redistribution of GP activity into underserved areas.[134] The demography option requires that for a minimum of 3 years, the GP commits to deliver two thirds of his or her activity in an underserved area. In exchange he or she receives an allowance worth between 5 and 10 per cent (up to €20,000) of the amount generated by the GP's activity per year during 3 years, plus an annual lump-sum (up to €5,000). The health and solidarity option (*contrat santé solidarité*) requires that for a minimum of 3 years, the GP commits to deliver at least 28 days of care per year in an underserved area. In exchange, the GP receives an allowance worth 10 per cent (up to €20,000) of the amount generated by the GP's activity in the underserved areas, as well as subsidies for travel. There are also financial or material incentives at the local level where departments or city councils try to attract practitioners.

The different incentives schemes have not been formally evaluated. However, some documents provide useful evidence on their uptake and impact. A 2011 publication summarising uptake one year after the launch of the aforementioned public service commitment contract (CESP) [222] showed that the uptake was below expectations (148 contracts signed instead of the 400 expected). Furthermore, in a choice modelling study, Delattre and Samson (2012) showed the limited impact of financial incentives. They suggested that incentives need to be designed that target students before completion of the curriculum and that aim to improve quality of life rather than solely increase earnings.[135] This is supported by a report issued by a committee of the high chamber of parliament in 2013, which highlighted that financial incentives used in the past had not been effective.[223]

4.3. Regulatory context for ensuring and improving the quality of primary care

4.3.1. Licensing and accreditation of primary care clinicians

Physician registration by the national physicians' organisation, the (*Ordre des médecins*) is usually granted upon request after completion of education and training curriculum and has permanent validity. It is a legal requirement and a mandatory process for all practising physicians.[224]

4.3.2. Revalidation

There is no formal recertification or relicensing process of doctors.[54]. However, all physicians are required to undergo continuous learning activities (*développement professional continu,* DPC). Since 2009

it has been mandatory for GPs to register for professional development courses and to monitor their DPC activities. GPs are free to choose a DPC organisation in their local area. DPC providers have to be registered by a national umbrella organisation in charge of continuous professional development courses, the *Organisme gestionnaire du développement professional continu* (OGDPC).[225] DPC supply is supervised by the national physician association.

4.4. Key components of education and training of medical doctors

4.4.1. Pathway for education and training for general practice

Following the publication of the definition of family practice by the European branch of the World Organisation of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians (WONCA Europe), the national college of general practice lecturers (*Collège national des généralistes enseignants*, CNGE)[226] published, in 2006, a list of competencies to be acquired during general practice studies. These competencies comprise clinical knowledge, communication skills and managerial skills. The document describes the scope of general practice and the need to develop a global approach, from prevention to rehabilitation, and for the delivery of patient-centred care that takes into account and coordinates local community healthcare resources.[30]

In order to obtain these competencies, future GPs enrol in one of the 47 medical schools. Their education and training comprises three main cycles (Figure 7).[61]

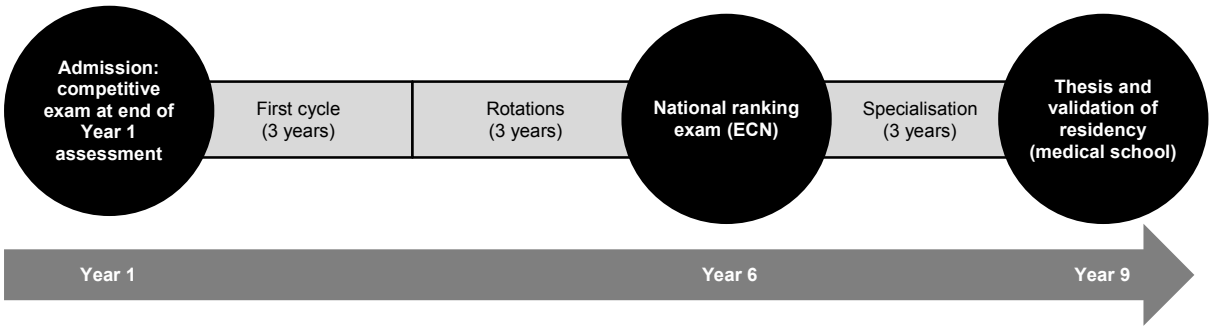

Figure 7 Medical education and training pathway for general practice in France

First cycle

The first year of the general practice education, called the *première année commune aux études de santé* (PACES) (first year common to all health studies), is common to all students wishing to pursue odontology, pharmacy, midwifery or medicine.[53] It is a theoretical degree, open to all individuals eligible for university studies. At the end of the year, a very selective competitive exam allows only 30 per cent of students to carry on studying medicine in the second year. The number of places in second year is limited by *numerus clausus*: there were 7,492 places in 2012–2013.

The second and third year are common to all medical students. They are mainly composed of lectures, supervisions and some short-term placements (e.g. nursing internships). Topics studied include physiology; anatomy; microbiology; and an introduction to pathology, pharmacology and bacteriology. Some subjects are optional, such as information technology or history of medical sciences.

At the end of the third year, students obtain a general degree in medical sciences (*Diplôme de formation générale en sciences médicales*), which is valued at 180 credits in the European Credit Transfer System (ECTS).[61]

Second cycle: L'externat

The second phase of general practice studies (*Deuxième cycle des études médicales*) is commonly referred to as the *externat*. During these three years, students develop both knowledge and practical experience of medicine. Teaching is organised into themes that supplement practical learning (rotations). Specifically, the programme is organised around pathologies, their treatment and their prevention (e.g. cardiology/pneumology). Students mostly gain experience in hospital settings, and start earning some money through their clinical work for the public hospital national agency, the *Assistance publique*, which manages hospital funding (from €128 to €248 per month).

Since 1997, it has been mandatory for students to complete an internship in general practice.[227] All medical schools are expected to offer this opportunity for students to experience general practice. However, in a national survey of student representatives,[62] the national association of medical students (*Association nationale des étudiants en médecine de France*, ANEMF) in France showed that in 2010 four medical schools (three of them in Paris) did not offer such an internship. Furthermore, in one third of the faculties, the general practice internship was shorter than the hospital-based internships, and only in 18 of 32 medical schools included in the survey did all students complete the internship in general practice. Despite positive feedback from students on their experience in general practice, some outstanding issues were still to be addressed: not all supervisors had received appropriate training, and not all of them had been financially compensated for their time.[62]

At the end of year 3, the national competitive ranking exam, the *Epreuves Classantes Nationales* (ECN) ranks students across the country. Those with the best grades are able to opt for the medical or surgical specialty (among 12) of their choice and to choose the location of the next phase of their training among places made available by the *numerus clausus* in each specialty and medical school. Students who pass the exam also obtain an advanced degree in medical sciences (*Diplôme de formation approfondie en sciences médicales*), which is valued at 120 European Credit Transfer System credits (master's level).[68]

Box 2 'Attractiveness' of general practice as a specialty

General practice remains one of the least favourite specialties among medical students.[228] In a recent study that sought to quantify the 'attractiveness' of medical specialties, Godefroy et al. (2013) developed an 'attractiveness index' taking into account preferences of students before they entered the ranking exam (Epreuves Classantes Nationales, ECN), their ranking at the ECN, and the choices they made following the ECN.[81] The index ranges from '0' (most attractive) to '1' (least attractive). They showed that, in 2012, the most attractive specialties were radiology and ophthalmology, each with a score of 0.13. The least attractive were occupational medicine (0.87) and general practice (0.83).

This low 'reputation' of general practice is further reflected by the low take-up of available posts in this specialty and that some posts remain vacant at the end of the allocation process.[229-231] This has been explained by students' perceptions of the status of a self-employed GP in private practice rather than the nature of general practice itself.[232] Thus, GPs have relatively lower earnings compared with other office-bases specialists working in the ambulatory care setting (at an average of €72,600, compared with €102,000 in 2012)[233]; a high workload (the average work week comprises 52 to 60 hours, including between 4.5 and 6.5 hours per week for administrative tasks)[211]; professional and geographical isolation; demanding medical responsibility; and burdensome administrative tasks.[232 234]

Third cycle: L'internat

The third phase of the studies is the *internat* (residency), when students enter specialty training. The *internat* of general practice lasts three years (compared with, for example, five years for surgical specialties). During the *internat*, students undertake at least six different residency placements in addition to taught course elements (seminars, lectures). There are two types of placements in ambulatory care available to general practice students.[82] The first is an internship in a general practice setting, usually undertaken during the third or fourth semester (or year 2) of the cycle. During this placement, the trainee gradually gains autonomy and performs an average of three to four medical tasks a day. These include medical consultations, but also technical tasks such as conducting allergy tests or ultrasound. One consultation may comprise several medical tasks (acts).

The second placement is a primary care placement in ambulatory care settings, the *stage ambulatoire en soins primaires en autonomie supervisée* (SASPAS), which is usually attended during the fifth or sixth semester (year 3). Students have to have completed the first placement satisfactorily to be eligible for the SASPAS. During this placement, the trainee is autonomous and performs independently up to 12 to 15 tasks a day. The SASPAS can take place in general practice or in alternative settings (e.g. school, prison, voluntary sector).

GPs eligible for the role of trainer, known as a *Maître de stage universitaire* (MSU), have to register with a medical school which awards the MSU title provided applicants meet the requirements of the chart developed by the national college of general practice lecturers, the *Collège national des enseignants généralistes* (CGNE): they have to be a specialist in general practice, to practise general practice in ambulatory care settings, to have had initial training in pedagogy, to participate regularly in professional development, to commit to regular evaluations and to have the ability to manage information systems.[96] The environment must be conducive to learning, with no fewer than 2,500 and no more than 7,000 medical tasks being performed each year by the GP or the practice. GPs receive a

compensation of €600 per month for the time they spend with the trainees (and €300 per month for a second-cycle trainee).[235]

There was consensus among the key informants interviewed for this study that the number of GP trainers was too low to meet the demand of students. It was noted that GPs were not necessarily willing to add hours to their workload by undertaking training activities. Key informants further reported that there was little incentive for those providing training in hospital settings to have residents being placed in ambulatory care settings, as this would reduce capacity in hospitals (IntFR01, IntFR06).

In theory, in addition to the mandatory placement and the SASPAS, students can spend an additional year in ambulatory care settings through placements in specialist practices, such as gynaecology or paediatrics, and an additional semester in SASPAS. However, key informants highlighted that, in practice, general practice students would typically only spend the required minimum of one year in ambulatory care settings (Int FR6). This was attributed, in part, to the aforementioned observation of an undersupply of trainers in general practice (IntFR05, IntFR06).

The third cycle is completed with the validation of the residency and a thesis. Successful students will then be awarded a Doctor in Medicine degree (PhD level).

4.4.2. Governance

The general characteristics of medical education are regulated by law and decrees published in the government gazette. The Ministry of Higher Education and the Ministry of Health develop draft laws, which are then decided upon by parliament. Draft proposals are submitted to the national council for higher education and research (*Conseil national de l'enseignement supérieur et de la recherché*, CNESER), a committee within the Ministry of Higher Education and Research that has to be consulted whenever changes are proposed to the curriculum.[236] This council gives advice on higher education policy, including changes to curriculum, diplomas and organisational issues (e.g. budget, new education providers). Medical education falls within the remit of the CNESER. For example, the legal text defining the characteristics of and requirements for the first year of the general practice education, the aforementioned *première année commune aux études de santé* (PACES) in 2009 took into account recommendations by the council.[53]

The Ministry of Higher Education and the Ministry of Health determine the list of specialties available to students, depending on healthcare and health research needs.[218] To a certain extent, the specialty case mix can therefore be adjusted by the government, which decides on the number of positions opened for recruitment in each specialty and in each medical school.[54]

These decisions are informed by a range of stakeholders. They include:

- Professional bodies, including the national committee of the physicians' organisation (*Conseil National de l'ordre des Médecins*, CNOM)[237] and the national college of general practice lecturers (*Collège National des Enseignants Généralistes*, CNGE)[226]
- Regional health agencies (*Agence régionale de santé*, ARSs)[220]
- Student associations, in particular the A*ssociation nationale des etudiants en médecine de France* (ANEMF) [238] and the national federation of residents unions (*InterSyndicat national des internes,* ISNI.[239]

With regard to the content of the courses and the aims and duration of the different placements, the Ministry of Health and the Ministry of Higher Education remain the decisionmakers. They jointly release decrees specifying the content of medical education (see, for example, the decree on ambulatory care training during the second cycle[227]).

Key informants interviewed for this study noted that decisions regarding medical education and training would depend heavily on the input of the deans of medical schools gathered in a conference (known as the *conférence des doyens*, literally, conference of the deans) and working together with student associations. Two key informants mentioned that there was a 'clear continuity' between the first and second cycle of studies, with stakeholders working 'in tandem' (IntFR01). The content of courses in the second cycle is shaped by the publication of the nation ranking exam (ECN) items on the *Centre national des concours d'internat* website,[99] jointly hosted by the Ministry of Health and the Ministry of Higher Education and Research.

Curricula for specialty training are also developed on behalf of the Ministry of Health and the Ministry of Higher Education and published in the government gazette. However, according to key informants, the teaching content in the third cycle is somehow disconnected from that in the two first cycles, and there is a perceived lack of clear organisation (IntFR01, IntFR02). It is in the third cycle that the role of the national college of general practice lecturers (*Collège national des généralistes enseignants*, CNGE) is the most relevant (IntFR01), but because of the very recent history of the general practice specialty and general practice departments (Section 4.2), the influence of the *collège* is considered to be limited compared with national colleges of lecturers in other specialties (IntFR06). As a consequence, when the different specialties are 'fighting' for resources (IntFR01), the general practice departments tend to lack influence and power (IntFR01, IntFR06).

4.4.3. Financing

Medical education institutions are mainly financed through the Ministry of Higher Education and Research. Since 2007, with the creation of the 'university foundation' status [240], they can also receive private funding. In the first and second cycles, the Ministry of Higher Education and Research funds medical schools by allocating a per capita budget to universities for students. This covers about 80–90 per cent of the university budget. The remainder has to be funded independently (IntFR01).

As indicated earlier, during rotations in the second cycle, medical students begin to receive some payment for their clinical work in both hospital and ambulatory care settings. This allowance is paid through a specific budget allocation, the 'Merri envelop' (referring to the *Missions d'enseignement, de recherche, de référence et d'innovation allocation*)[90], which is funded by the Ministry of Health and distributed to hospitals through the respective regional health agency. In the third cycle, trainees' salaries are also paid through the Merri allocation.

Lecturers and trainers are paid by the Ministry of Higher Education and Research in addition to the salary they receive from the Ministry of Health for clinical work (IntFR01, IntFR02), with the exception of the trainers in ambulatory care settings who are paid through the aforementioned Merri allocation. Thus, most of the financing of the third cycle is supported by the Ministry of Health through the regional health agencies and hospitals.

The majority of ambulatory care trainers, unlike trainers in hospitals, do not have an affiliation with the Ministry of Higher Education and Research (IntFR06). As a result, most of the costs of the third cycle are supported by the Ministry of Health through the respective regional health agency and hospitals. Private companies (e.g. pharmaceutical companies) provide an additional source of funding through the organisation of conferences and courses in the different specialties (IntFR01).

4.4.4. Quality standards for medical education and training

Quality standards for teaching

There seems to be no dedicated organisation or mechanism to ensure and monitor the quality of medical education or the adherence of teaching to standards. In principle, the Ministry of Higher Education is responsible for quality of education (IntFR01). However, as key informants interviewed for this study noted, 'universities are autonomous' (IntFR01, IntFR02, IntFR04) with regard to their teaching programme set-up, meaning that there is in practice no overarching national organisation in charge of monitoring implementation of the curriculum.

Key informants interviewed for this study suggested that one implicit tool for quality assurance of teaching is the national ranking exam: because all students compete against each other for the best ranking at the national level, there is an incentive for medical schools to prepare them well by delivering high quality teaching (IntFR01, IntFR04).

Quality standards for training

The Ministry of Higher Education and the Ministry of Health jointly define broad principles for the organisation and validation of training (see, for example, the decree on the organisation and validation of training in the third cycle).[241] The trainer status (MSU), granted by the medical schools and defined by the national college of general practice lecturers (CNGE) chart (Section 4.4.1), constitutes the main tool for ensuring training quality standards. The *collège* chart sets standards for supervising trainees during placements in general practice (e.g. being a specialist in general practice or having attended an initial pedagogy training) and provides a training framework by describing the objectives and content of the training, from observation to indirect supervision.[96]

There is also a variety of tools that can contribute to the harmonisation of training standards. This includes forms for validation of placements (IntFR01) and feedback provided by trainees on trainers and training practices.[62]

4.5. Stakeholder views on the current system

A recent report published by the federation of residents' unions, the *Intersyndicat national des internes*, was critical of the most recent initiatives that aimed to encourage better distribution of GPs.[242] Drawing on a report released in 2008 by the French senate comparing regulation in eight countries[221], it highlighted the lack of effectiveness of current redistribution mechanisms that mainly rely on financial incentives and called for a transformation of the healthcare system and more 'qualitative' measures, which would take into account the expectations of a young generation of GPs and the needs of the population.

The national students' association, the *Association nationale des étudiants en médecine de France* (ANEMF) advocates for a wide reform of specialisation training and the promotion of general practice through relevant placements in private practice and ambulatory care.[243] This is also at the core of the recommendations made by Lefevre et al. (2010), who surveyed 1,780 medical students about their choice of specialty.[228]

A governmental committee was set up in 2009 to reform practical medical training. After two years of research, the national committee for specialty training (*Commission nationale de l'internat et du post internat*, CNIPI) produced a report defining new orientations. However, the recommendations were not implemented, partly because of a change in government.[244]

In a report released in February 2013 to inform policymaking, Senator Maurey summarised ongoing challenges and made five proposals to reform medical education and improve the distribution of the general practice workforce across the country:[223]

- Modification of entry criteria for medical schools. The report highlighted the negative impact that the competitive exam at the end of year 1 can potentially have on student selection and choice of career in the latter stages of the pathway: by focusing on fields such as mathematics and chemistry, the exam tended to favour students who studied basic sciences in high schools rather than social and health sciences. In France, the former tend to come from wealthier and more urban backgrounds and therefore would be less likely to practise in rural areas at the end of their studies.
- Diversification of teaching content. Most of the training is related to pathologies and is delivered in hospital settings. Students would also benefit from ethics, health economics or management training and from placements in other types of settings, including ambulatory care and private practice.
- More mandatory placements in general practice and improved conditions for training in ambulatory care. The proportion of students undertaking placements in general practice should increase. Material incentives such as housing or transportation benefits could raise interest for such placements among students.
- Regionalisation of the national ranking exam (ECN). Since students tend to undertake their specialisation training in the same location where they completed their second cycle, regionalising of the national exam could contribute to the retention of students in underserved regions.
- Creation of a 'professionalising' year at the end of the pathway. Adding one year of training to the specialisation training (increasing the duration of that cycle from three to four years) would give the trainees more confidence in their skills and could encourage them to set up their own practice sooner.

Most of these suggestions were also discussed by the key informants interviewed for this study. Evidence from the literature and from the interviews identifies four types of measures, discussed below, that could potentially address some of the future challenges that the education and training system are likely to face.

Measures to strengthen general practice in medical schools

There was consensus among key informants on the need to promote general practice within medical schools through the appointment of a greater number of professors and lecturers specialising in general

practice. Current figures show the discrepancy between the number of students (3,365 entered a general practice cycle in 2013[81]) and the number of lecturers in general practice departments (in 2013 there was one full-time equivalent lecturer for 107 students in general practice, compared with an expected ratio of between 1:10 to 1:15).[245]

One key informant suggested that increasing the number of general practice lecturers could allow them to take over some of the teaching that is currently being delivered by other specialists but which would be more relevant as part of general practice teaching. This would include, for example, teaching on chronic diseases and their management (IntFR01).

Measures to increase the volume and quality of ambulatory care training

Increasing opportunities to train in general practice would be welcomed, not only by stakeholders involved in medical education and training decisionmaking, but also by the students themselves.[62] It was suggested that this could help address concern on the part of graduates that do not feel 'ready' (IntFR01) for general practice, as they are given mostly a 'hospital vision of medical practice' (IntFR04). Several key informants highlighted the benefits of the relationship between the trainer and the trainee, and how a 'buddy system' (IntFR03) could help develop relevant skills for setting up a private practice. Two key informants argued that the strength of two existing financial incentive schemes, namely, the *contrat d'engagement de service public* (CESP) which provides medical students with a monthly allowance during their studies starting from year 2 in exchange for a commitment work in an underserved area for a specified period of time) and the *praticien territorial de médicine générale* (PTMG) which created the 'territorial general practitioner' to encourage young GPs to set up their own private practice (see Section 4.2)) was not the financial incentive, but the support system embedded within the schemes. Strengthening the relationship between trainer and trainee would require recruiting more trainers in private practice and ambulatory care. Recruitment efforts have been a national objective for a while [246], and despite lagging behind expectations, numbers have steadily increased in recent years, to reach 7,300 GP trainers (MSU) in 2013 (IntFR06). However, key informants also noted that some training needs remained unmet and that some regional health and healthcare agencies are proactively trying to recruit more trainers through the engagement of local GP unions and associations (IntFR05).

Measures to improve GP status

There was an indication in the literature[234] and among key informants that measures aiming to improve social protection of GPs may persuade a higher number students to go into general practice studies. Tax relief and increased tariffs, but also (and more importantly) sickness leave and maternity leave such as stipulated in the in the PTMG contract (Section 4.2), were considered to be appropriate incentives (IntFR01, IntFR05).

Measures to transform the organisation of general practice

With the growing number of group practices[40] and the growing interest by students in salaried positions,[234] most key informants suggested that changes in the way primary care is organised and delivered could have a favourable impact on attracting students to general practice and into underserved areas:

> Young doctors are not put off by practising in rural areas; what they don't want to be is isolated. (IntFR03)

One key informant reported positively on the increasing number of multi-professional health centres in some areas where traditional private practice struggled to recruit young GPs (IntFR05). These were seen as a way of providing a support network and to reduce the isolation of the GPs as the only provider responsible for continuity of care. Multi-professional health centres are based on a care project shared by a number of mostly self-employed professionals working together in a network and sharing some responsibilities and information systems.[117] Professionals do not necessarily share a practice, but some resources are pooled in order to offer a comprehensive range of services to patients. In 2012, the Ministry of Health counted 235 active multi-professional health centres (and 450 under development) grouping 2,650 professionals (e.g. GPs, nurses, physiotherapists).[117] Some 80 per cent of the centres were located in rural areas.

Organisation of care was also at the core of a report published in 2009 by the Commission jeunes médecins (young doctors committee), hosted by the national physicians' association.[247] The committee proposed reforms to the organisation of care, including the redefinition and transfer of competencies among different professionals and the promotion of combining working in hospitals with working in ambulatory care.

5. Germany

5.1. Health system context

The Germany healthcare system is based primarily on statutory health insurance (SHI), which accounted for just under 68 per cent of total health expenditure in 2012, complemented by taxation (9 per cent), private health insurance (9.5 per cent), and out-of-pocket payments (12 per cent).[150] Since 2009, all residents have been required to take out health insurance. SHI contributions are income-dependent, but they are capped at a maximum contribution and shared between employer and employee. Dependants are covered free of charge; those receiving social assistance or long-term unemployment benefits are covered by the state through the municipalities or the labour agency. In 2011, 87.5 per cent of the population was covered by SHI and 11.7 per cent by private health insurance. A small proportion was without insurance (0.2 per cent). For the remainder, their status was not known.[248]

Responsibility for the statutory system is shared by the federal government, the 16 state (*Land*) governments and the local governments, and many tasks have been delegated to corporatist actors. The highest decisionmaking body in the SHI system is the joint federal committee, the *Gemeinsamer Bundesausschuss* (G-BA). It brings together the national association of SHI funds and the federal associations of healthcare providers (physicians, dentists and hospitals), with patient representatives involved in an advisory role. Regulation of the healthcare system is embedded in legislation, set out in the social code book, chapter 5 (*Sozialgesetzbuch V,* SGB V).The main role of the federal Ministry of Health is to secure and maintain the publicly financed SHI system.[249]

Under SHI, patients are entitled to access a comprehensive set of healthcare services, defined by law. Individuals have (almost) free choice of which SHI fund to use, with a risk-compensation mechanism introduced in 1994 to compensate for differences in populations insured by different funds. Initially adjusted for age, sex and incapacity to work only, since 2009, SHI funds receive centrally allocated risk-adjusted contributions that are additionally based on morbidity.[250]

Healthcare services are provided through a mix of public and private providers. Ambulatory care is mainly delivered by office-based primary and specialist care physicians; the provision of outpatient care in hospital is highly restricted. Patients generally have free choice of any provider in the ambulatory care sector and some choice of hospital upon referral. Hospitals are either public (e.g. owned by a state, district or city), private for-profit or private not-for-profit (e.g. owned by a church-based charitable organisation).

5.2. Primary care

In Germany, primary healthcare (*Primärversorgung*) is provided within a broader ambulatory care sector, which comprises family physicians (also referred to here as general practitioners, or GPs) as well as office-based specialist physicians. At the end of 2013, some 41 per cent of office-based doctors worked as family physicians *(Hausarzt)*[27]; among office-based specialist physicians the most common specialties included gynaecology (8 per cent), internal medicine as speciality (7 per cent), paediatrics (5 per cent), as well as orthopaedics, ophthalmology, surgery and neurology (about 4 per cent each).[119]

Patients do not have to register with a family physician, and GPs do not have a formal gatekeeping function. The 2004 health reform sought to strengthen GP-centred care (*Hausarztzentrierte Versorgung*) through requiring SHI funds to offer their members what is referred to as GP contracts. In these schemes, patients sign up voluntarily with a family physician as the first point of contact for a period of at least one year.[251] Since 2008, all statutory health insurance funds have to offer GP contracts. The uptake of such schemes has remained low, at only about 20 per cent of those covered by statutory health insurance since their introduction,[36] and the availability of GP contracts varies across regions.[252]

Other changes introduced during the 2000s that sought to strengthen the coordination between the ambulatory and hospital sectors, and the role of general practitioners within the system, include the introduction, in 2002, of a national programme of structured care approaches for those with chronic disease (disease management programmes), in which the GP typically (although not always) acts as principal coordinator or provider of patient care.[253] The 2004 reform also saw the introduction of medical care centres (*Medizinische Versorgungszentren,* MVZ), which provide care across several healthcare specialities within the ambulatory care sector. The promotion of medical care centres is aimed at enhancing care coordination through teams that typically include at least one general practitioner and that may also work with nurses, pharmacists, psychotherapists or psychiatrists, as well as other healthcare professionals; the latter would, however, not typically be a formal part of the medical care centres.[254]

More recently, the 2008 reform of long-term care enabled the piloting of delegating selected tasks traditionally performed by doctors, including the monitoring of patients with chronic disease, to non-medical staff, such as nurses or physician's assistants.[255] The 2008 law on the advancement of organisational structures in healthcare[256] and the 2012 reform (*GKV-Versorgungsstrukturgesetz*, GKV-VStG) further strengthened provisions for GP-centred care; the latter also introduced a range of explicit measures to ensure appropriate service provision in underserved areas, which we describe in further detail in Section 5.2.4. The commitment to advancing GP-centred care in the German SHI system was renewed in the 2013 agreement of the incoming coalition government, including the upholding of the legal requirement of SHI funds to offer GP contracts.[141]

Payment of doctors in the ambulatory care sector

In the ambulatory care sector, physicians are remunerated on the basis of fee-for-service, albeit within a strictly regulated framework.[251] All doctors practising in the ambulatory care system and wishing to be reimbursed through SHI must be members of a regional association of SHI physicians, the *Kassenärztliche Vereinigung* (KV). There are 17 such regional associations in Germany (one in each of the 16 federal states, except for North Rhine-Westphalia, the most populated of the federal states, which is represented

by two). They are represented at the federal level by the national association of SHI physicians (*Kassenärztliche Bundesvereinigung*, KBV).

The regional SHI physicians' associations contract with the regional associations of SHI funds and other parties. They negotiate a regional budget, which the respective regional association then disburses to its members, the individual SHI physicians. Disbursement of funds is calculated from the regional budget (*Gesamtvergütung*) and the claims submitted by individual SHI physicians; payments are disbursed quarterly. Reimbursement is based on a national points schedule, the national relative value scale (*Einheitlicher Bewertungsmaßstab*, EBM), which is negotiated by a valuation committee (*Bewertungsausschuss*), formed by the KBV and the national association of SHI funds (*GKV-Spitzenverband*). The monetary value of points and, thus, the price of a given service, is determined by the budget set at the regional level. As budgets vary across regions, so do the prices for the same service. Since 2009, a target volume is set for each practice, reflecting medical specialty and the number and age of patients, presenting, in essence, a form of morbidity-adjusted capitation payment. Where services delivered in a given period exceed the target, additional services that were provided are reimbursed at a lower rate.

In order to ensure adequate provision of health services in the ambulatory care sector, the regional SHI physicians' association can incorporate financial incentives into the reimbursement schedule through, for example, waiving the aforementioned target volume for doctors working in underserved areas or through subsidies to support the establishment of new practice. These stipulations were further strengthened by the aforementioned 2012 healthcare reform, with a particular focus on the creation of incentive schemes to ensure sufficient supply in underserved areas (see also below).[115]

5.2.1. Characteristics of practices in the ambulatory care sector

Office-based physicians, including GPs, mostly work as independent professionals in private practice, with solo practices remaining the predominant form, although joint working in group practices or medical care centres is gradually becoming more common. For example, in 2012, there were about 20,000 group practices, compared with just under 82,000 solo practices in the ambulatory care sector.[257] Among GPs, in 2013, around 38 per cent worked in group or job-sharing practices, with the remainder working in solo practices.[20]

The number of medical care centres (MVZ) has increased, from a total of 70 at the end of 2004 to 2,006 at the end of 2013.[258] Of these, 38 per cent included hospitals either as (co-)owner or collaborator of the practice. Of the 12,788 doctors working in medical care centres as at 31 December 2013, the majority (89 per cent) were salaried and the remainder were SHI contractors. Notably, the majority of medical care centres work on the basis of salaried doctors only (around 70 per cent in 2012), while the number of those with exclusively contracted doctors has been declining steadily as a proportion of all medical care centres.[259] In 2013, the most common specialties working in medical care centres were GPs (14.5 per cent), specialists in internal medicine (11 per cent), and surgeons (8 per cent); in 2013, more than half of medical care centres included GPs.[258]

Patients who wish to be seen by a GP usually receive an appointment the same day or have short waiting times;[260] appointments with specialists typically require waits of up to four weeks. SHI funds typically

operate telephone hotlines, but their purpose is to provide patient information on administrative issues, such as the range of services covered by the SHI fund, only.[260]

5.2.2. General practice workforce

Physicians working as GPs in Germany are typically trained in general practice or internal medicine. As noted above, in 2013, some 41 per cent of office-based doctors worked as general practitioners. Of these, around 65 per cent (34,010) held a specialist qualification in general practice (*Allgemeinmediziner*), while 25 per cent (13,412) were specialists in internal medicine and the remainder (5,803) comprised physicians without GP-specialty training who practise family medicine.[27] Of physicians working as GP, 41 per cent were women, and about 8 per cent of GPs worked as salaried employees. Group practices usually consist of two physicians.

There has been a structural shift in the composition of the physician workforce, with a fall in the number of general practitioners and an increase in specialist doctors.[19] Thus, between 2000 and 2012, the proportion of GPs in the ambulatory care sector fell steadily, from 60 per cent in 1991 to 46 per cent in 2012, while the proportion of specialists in ambulatory care rose by a factor of 1.5, from 40 per cent in 1991 to 54 per cent in 2012.[47]During that same period, the proportion of new certifications for specialist in general practice fell from 16 per cent in 2000 (1,626/10,098) to 10 per cent in 2012 (1,197/11,891).[22]

In addition to this structural shift, there has been a shift towards older ages in the ambulatory care sector in particular. For example, in 1993, the average age of physicians in ambulatory care was 47.5 years, and just under 9 per cent were aged 60 years and older.[57] By 2010, the average age had risen to 52.1 years, and the proportion of those aged 60 years and older had more than doubled, to 21.5 per cent. This compares to an average age of hospital doctors of around 41 years.[22] Ageing of the workforce poses a particular challenge for the provision of general practitioners, with, in 2012, an average age of 54.3 years. Some 31 per cent of GPs are aged 60 years and over and more than two-thirds are aged 50 years and older.[20] A 2010 report projected, based on trends of general practitioners entering and exiting the ambulatory care workforce, a decline in their number by about 7,000, or 13 per cent, by 2020.[48] This compares with a projected need of some 15,000 GPs by 2020 to secure care for the population in light of demographic changes.[47]

5.2.3. Distribution of GPs

Considering the distribution of doctors in the ambulatory care sector overall, Germany is facing challenges in ensuring the adequate provision of physicians, with instances of oversupply of doctors in and around metropolitan areas and, as indicated above, shortages in less densely populated rural and economic-structurally weak areas, in particular in the eastern part of the country.[18] Figure 8 illustrates the density of general practitioners across Germany, which, in 2012, ranged from 47 per 100,000 to 94 per 100,000 across districts.[45] About half of all districts (47 per cent) had 56–66 general practitioners per 100,000 population.

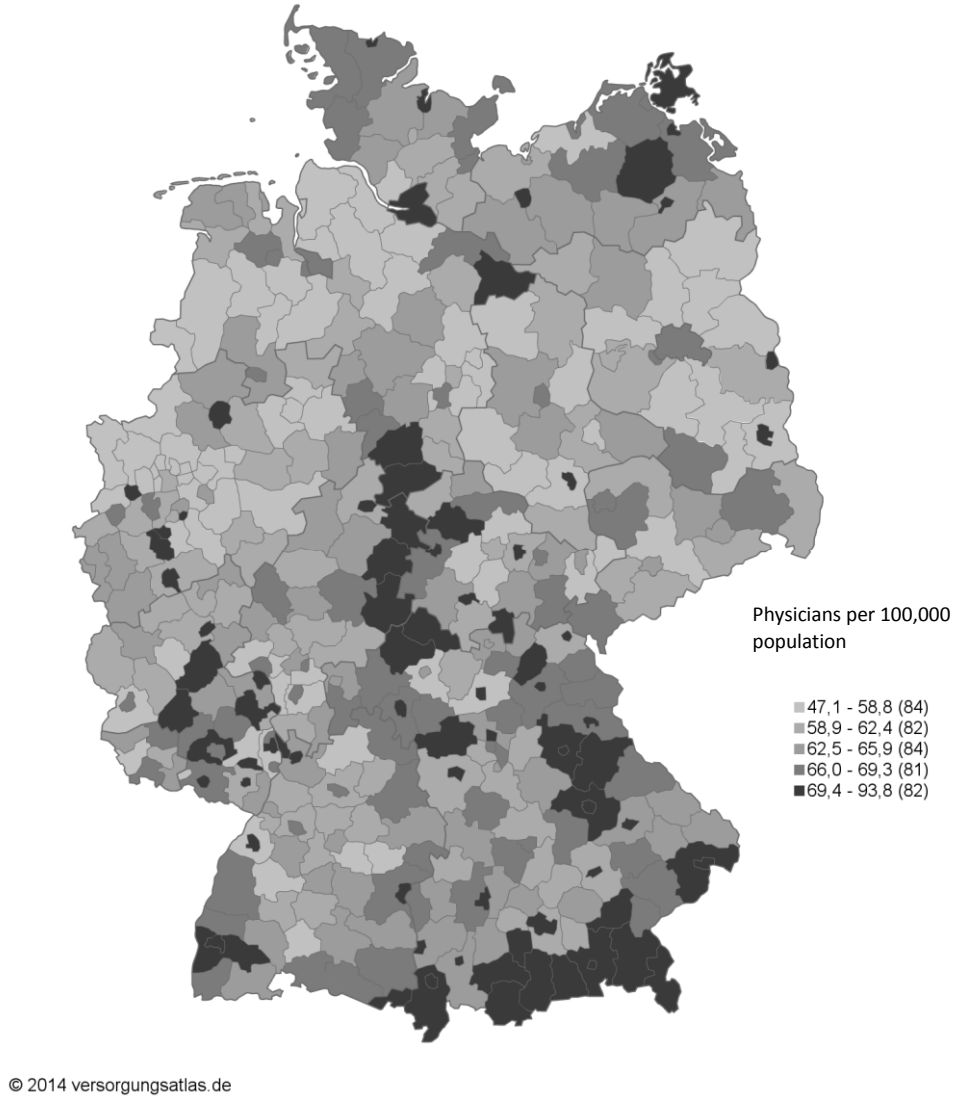

Figure 8 General practitioners per 100,000 population by district, Germany, 2012
Source: versorgungsatlas.de (2014)[45]

A number of regional SHI physicians' associations have reported challenges in their ability to replace family physicians who are due to retire in the near future. For example, recent figures for the northern-most state show that about one third of GPs were aged 60 years and older and expected to retire in due course.[261] This equates to some 600 GPs exiting the workforce; yet, in 2013, the number of newly qualified family physicians was just under 60. Projections for the south-western state of Rheinland-Pfalz estimated a shortfall of some 1,400 family physicians by 2020, taking account of current trends in the physician workforce vis-à-vis projected patient numbers in the region.[262]

Previous sections have highlighted the general challenge of attracting a sufficient number of medical graduates into general practice. Although the number of medical students has remained fairly stable over the past 10 years, one cross-sectional survey of some 11,500 medical students (13.5 per cent of all medical students) carried out in 2014 found that the proportion of those definitely interested in pursuing a specialisation in general practice was low, at 10 per cent, with a further one third considering general practice as an option.[147] That survey also suggested that there was a strong preference among medical students overall for working in urban areas, with more than half of those surveyed reporting not wishing

to work in very small or rural communities. This issue was also raised by other studies that have pointed to a preference for physicians to work in urban rather than rural areas.[260] This preference is in part related to financial concerns, but also to the local infrastructure. For example, one study of registrars in five regions who had not yet completed specialty training and of whom 35 per cent aimed to specialise in general practice, identified income; the number of required on-call services per month; and the availability of local infrastructure for children, such as nurseries and schools, as the strongest determinants for a decision to set up practice.[263] That study showed that higher income, along with a fixed maximum number of required on-call services of two per month, would provide physicians with an incentive to work in rural settings. Earnings and local infrastructure were also described as important challenges in a small qualitative study of GPs' views on working in rural practice and were suggested as points for intervention to attract newly qualified GPs into underserved areas.[264]

5.2.4. Workforce policies for the provision of primary care nationally and locally

Planning of the healthcare workforce is generally undertaken at the level of the individual federal states. Regarding regulation of medical student intake, the main actors include the state governments and medical schools (see also Section 5.4).[265] Previously, medical student intake was determined at the federal level through a *numerus clausus* for all medical schools set by the federal Ministry of Science and Technology. This has changed, with state governments progressively achieving a stronger position in educational matters. Thus, the respective ministries of science and technology or of education define the number of medical students in consultation with the medical schools.[56] In response to changing demographics, states increasingly monitor the number of practising physicians and medical students, although they have not yet been involved in the regulation of actual numbers.

Regarding the number of practising physicians, federal law as set out in the social code book stipulates that the regional associations of SHI physicians, in consultation with the regional associations of SHI funds and the relevant state authorities, develop needs-based plans that regulate the number of SHI-affiliated, office-based physicians in the ambulatory care sector in the region (*Bedarfsplan zur Sicherstellung der vertragsärztlichen Versorgung*). [265] Plans are informed by a directive issued by the joint federal committee (G-BA) at federal level, which, until recently, set general quotas determining the local physician to population ratio per specialisation (including for general practitioners). Introduced with the 1993 healthcare reform, the overarching aim of the planning instrument was to control the oversupply of physicians in the ambulatory care sector.[266] Specifically, it required that in regions where supply exceeded 10 per cent of the defined general quota in a given specialty, the relevant regional association of SHI physicians and of SHI funds would need to determine whether there was indeed a case of oversupply, and if there was, the associations were required to impose restrictions on the establishment of new practices by physicians in the relevant specialty. It is important to note that the planning instrument only applies to physicians wishing to establish a practice that qualifies for reimbursement under the statutory system (SHI-affiliated physician); the physician will have to apply for a licence from the regional association of SHI physicians to do so. There are no restrictions on the establishment of physicians who wish to practise independently from the statutory health insurance system.

Previously the baseline for determining oversupply generally related to 1990 supply figures. Some adjustments were made to take into account changes in physician specialisation groups that may have

occurred since then; for example, physicians with specialisation in general practice from 2000 onwards (based on 1995 data).[265] Other factors, such as age, gender, morbidity or socio-economic status, were not taken into account in determining supply. While this approach had generally been viewed as sufficient to control oversupply, it was considered inadequate to prevent undersupply of physicians in some specialties and regions, especially in rural regions in the eastern part of the country.[267]

The 2012 healthcare reform sought to address this issue by introducing measures to advance the regulation of the number of SHI-affiliated, office-based physicians in the ambulatory care sector across the country and required the federal joint committee to revise the national directive as the basis for the regulation of physician supply.[115 266] A particular focus was on rural and underserved areas and on general practitioners. New stipulations also include giving a stronger voice to authorities at the regional, or state, level.[268] From 2013, main changes include a more flexible approach to regional planning units; the re-definition of supply levels (*Versorgungsebenen*) into general practice, general specialist care (e.g. ophthalmology; surgery; gynaecology; dermatology; ear, nose and throat; paediatrics), specialist care (e.g. anaesthesia, internal medicine, radiology, child and adolescent psychiatry) and advanced specialist care (e.g. pathology, transfusion medicine, nuclear medicine, neurosurgery); the consideration of demographic factors such as age; and specific local needs, among other things.[269] There are reports from a small number of regional SHI physicians' associations highlighting the positive impacts of the revised regulations on the creation of new GP practices,[270-272] although this experience does not appear to have been shared everywhere.

Incentives to encourage GPs to work in underserved areas

As noted above, one of the overarching aims of the 2012 healthcare reform was to secure adequate supply of physicians in the ambulatory care sector that takes account of local need, in particular in rural and underserved regions.[268] In addition to revising the regulation of physician supply as described above, it put in place a range of explicit measures seeking to encourage doctors to set up practice in areas where there is a shortage in the ambulatory care sector. Measures include financial incentives, increased opportunities to establish a second practice and to delegate medical tasks, and initiatives by the regional SHI physicians' associations to support the establishment of a practice, among others.

Regarding financial incentives, while legislation already requires the regional associations of SHI physicians, together with their national association, to put in place appropriate financial and other measures to ensure, improve and promote adequate physician supply across the country, the 2012 reform provides for the possibility to establish 'structural funds' (*Strukturfond*) to target regions where there is a particular need.[115] Financed from the morbidity-adjusted overall (regional) budget with equal contributions from the regional SHI physicians' associations and SHI funds (at 0.1 per cent each), funding from the structural funds was to be used to support investments for the establishment of new practices or the establishment of second practices, for additional reimbursement for services provided, and for the support of medical students in training and the awarding of stipends. The reform also foresaw the further development of the legal framework enabling the operation of ambulatory care practices by SHI physicians' associations and local authorities. The 2014 report by the advisory council on the assessment of developments in the healthcare system (*Sachverständigenrat zur Begutachtung der Entwicklung im Gesundheitswesen*, SVR) noted that, while a number of regional SHI physicians' associations have made

use of the possibility to incentivise practice in underserved areas, the overall role of these measures has remained small.[47]

More recently, the 2013 Coalition agreement mentioned above sought to further stipulations set out in the 2012 reform, through, for example, permitting hospitals to provide ambulatory care services in underserved areas, promoting practice networks, and firming up existing regulations that permit the buying up of practices in areas where there is an oversupply of physicians.[273]

5.3. Regulatory context for ensuring and improving quality of primary care

All qualified physicians in Germany must be a member of their respective physicians' chamber at the state level (*Landesärztekammer*).[251] The chambers are regulated by state law; they are responsible for specialty training and accreditation and continuing education, as well as the setting of professional, ethical and community relations standards, among other things. The state physicians' chambers are represented, at the federal level, by the German medical association, the *Bundesärztekammer* (BÄK although in contrast to the state chambers, the latter is not a statutory body and can therefore only pass recommendations.

5.3.1. Licensing of physicians

All physicians wishing to practise medicine or carry out specialty training in Germany must be in possession of a valid full or temporary licence to practise. The full licence to practise is the *Approbation*, which is valid across Germany. A temporary licence to practise, or *Berufserlaubnis*, is a time-limited document that is valid only within the federal state in which it was issued; this is issued mostly to graduates with foreign nationality.[66] The issuing of a full or temporary licence to practise is the responsibility of the state health authority of the respective federal state. The prerequisites for becoming a member of the medical profession in Germany are set out in the medical practitioners' act, the *Bundesärzteordnung*.[274]

5.3.2. Revalidation

The 2004 health reform introduced a form of revalidation,[275] requiring all physicians to document and verify that they have undertaken continuous professional education (CPE). Its objectives are to ensure continuous improvement in the quality of care and so ensure delivery of care that is safe.[276] The requirement for CPE can be met by means of a CPE certificate issued by the respective state physicians' chamber, or an equivalent certificate that meets the requirements set by the physicians' chambers as described in the (model) regulations on continuing education, the (*Muster-*)*Weiterbildungsordnung*, set out by the German medical association.[277] Physicians practising within the SHI system in the ambulatory care sector will have to demonstrate every five years before their regional SHI physicians' association that they have undertaken continuous professional education during the preceding five years.[278] Where physicians fail to demonstrate this, the respective SHI physicians' association is obliged to reduce the physicians' reimbursement by 10 per cent for the first four quarters following the five-year assessment period, and by 25 per cent from the following quarter onwards. The physician may meet the CPE requirement subsequently but this will not count towards the CPE requirement for the following five year

period. Full reimbursement will be reinstated only when the physician meets the continuous professional education requirement fully. Physicians who fail to meet the continuous professional education requirements within two years past the five-year deadline face withdrawal of their licence to practise within the SHI system by the relevant SHI physicians' association.

5.4. Key components of education and training of medical doctors

5.4.1. Pathway for education and training for general practice

In Germany, the medical career pathway consists of a preclinical education period, which lasts a total of six years, after which the student obtains her or his first formal qualification; specialist training in general practice is scheduled to be completed over a period of five years.

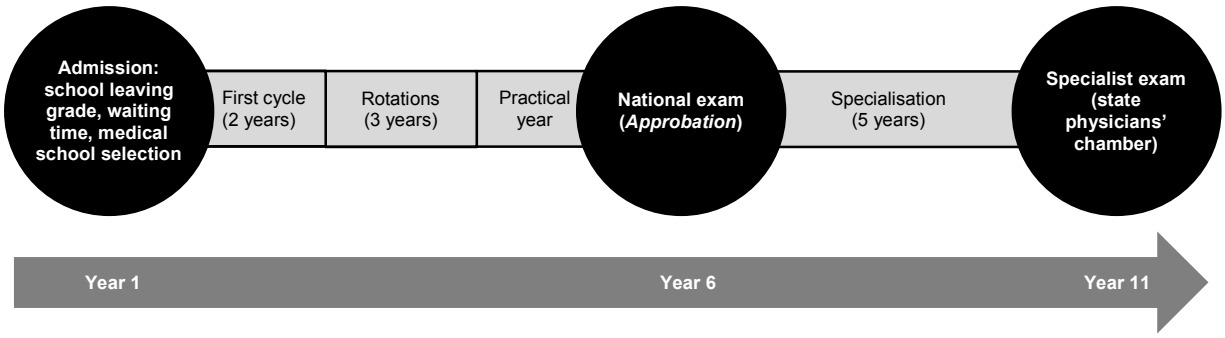

Figure 9 Medical education and training pathway for general practice in Germany

Admission

Admission to one of the 37 universities with medical faculties in Germany (including one private medical school) is based on one of three criteria: (i) final secondary school exam grade (*Abitur*); (ii) waiting time (number of half-years (*Semester*) since obtaining the university entrance qualification minus the number of *semester* enrolled in a German university in a subject other than medicine); and (iii) selection criteria set by individual medical schools (*Auswahlverfahren der Hochschulen*). Some 20 per cent of applicants are admitted on the basis of having achieved top grades in the final secondary school exam (*Abiturbestenquote)*, 20 per cent on the basis of their waiting time and the remaining 60 per cent on the basis of selection criteria set by individual medical schools.[56] These selection criteria comprise a combination of two or more of the following: final school grade, weighted individual school leaving grades, a scholastic aptitude test, an interview, and other criteria, although the school leaving grade remains a significant factor in the selection process.

As noted above, the annual number of places available at medical school is determined by a *numerus clausus*, which is calculated from the number of potentially available places and the number of applicants. The number of places at medical school has remained fairly stable over the past 30 years, at between 10,000 and 11,000 per year.[57] Taking the winter half-year 2013–2014 and summer half-year 2014 together, there were a total of 10,727 places and 63,448 applicants (that is, around 6 applicants per place).[58 59]

The different entry routes into medical school have resulted in varying approaches to admission across Germany, and this has been subject to some debate among stakeholders. In particular, the reliance on the school leaving grade as the main criterion for admission is seen by some as falling short of accounting for social competencies that are required by future clinicians,[279] although there is recognition that this approach is likely to ensure that students will complete their studies:

> [There has been a demand] for years that a…different criteria system [be used]…to take into account not just the *numerus clausus* but also social aspects.… Of course, the faculties welcome the *numerus clausus*, because that is the best guarantee and plus there is a clear correlation.… The better the high school grades, the more likely studies are completed without problems, and with very good results and in the minimum time that we have in Germany. We have low university dropout. (IntDE05)

One key informant interviewed for this study argued that, while there is a persuasive argument to emphasise a broader skill set, at the same time there is little evidence that selection based largely on school leaving grades will not lead to competent physicians:

> If the student has a good leaving result, then he will do well in the exams. Whether or not that is a good requirement for a good general practitioner is a completely different question and has never been researched at all. That means that on the other hand no proof has been shown that a good student who has great results makes a bad general practitioner, that hasn't been proven either. (IntDE01)

A main challenge pointed out by several key informants was that if the admissions process were to be changed to emphasised criteria other than school grades, this would require a change in the legal framework, because of the constitutional right of every individual to choose his or her place of study:

> There is a further problem: in Germany we have five times more applicants for a degree than we have space on the degree course.… Because they are very sought after, some parents and students sue the universities in order to get in.… So for that reason the criteria for admission need to be able to be inspected by a court. (IntDE01)

Admission to medical school has become the subject of broader discussion, as reflected in the take-up of this subject by the new coalition government, which, in its 2013 agreement, foresees the development of a 'Masterplan medical studies 2020', which is expected to focus on better targeting admission to medical school.[141]

Undergraduate education

Undergraduate medical education is guided by a national framework as set out in the licensing regulations for physicians (*Approbationsordnung*) issued by the Ministry of Health.[65] Medical education comprises three parts: basic science (first two years; preclinical period), followed by a clinical part (three years), and the practical year in year six. During the preclinical period, students will also receive training in first aid, and they have to undertake three months of mandatory practical nursing training in a hospital. The clinical part of the training includes work placements (*Blockpraktikum*) of one to two weeks' duration in a

range of clinical fields, including in general practice (a minimum of two weeks), as well as a four-month clinical elective (*Famulatur*) during holidays,[66] which is divided into four one-month clerkships, of which one must be undertaken in a GP practice. The final clinical, or 'practical', year (*Praktisches Jahr*) consists of 48 consecutive weeks of practical training. It is divided into three full-time rotations each lasting four months, of which rotations in internal medicine and surgery are mandatory.[66] The third rotation is optional and can be based in general practice or a specialty of the student's choice.[66] Medical examinations *(Ärztliche Prüfung)* occur in three stages; the first (preclinical) examination takes place two years after entry. Following the completion of three further years of medical studies, that is, before the final practical year, students sit the second national exam. They sit the third exam after completing the practical year. The exams include nationally standardised written components (first and second exam) and an oral-practical exam (first and third exam). Following successful passing of the final exam, medical graduates can apply to obtain their license to practice (*Approbation*).

The general requirements for medical studies are set by the aforementioned licensing regulations. These include a list of compulsory disciplines and subjects, the list of placements and the total number of teaching hours in the two segments (preclinical and clinical). Within this framework, some room is left to individual medical schools. As a result, according to one key informant, there are 'considerable difference[s] between universities when it comes to teaching medicine' (IntDE02). Some key informants interviewed for this study observed that undergraduate training may not prepare students well for the softer skills required for actual clinical practice:

> In undergraduate education…in Germany is not educating people for doing the job of a doctor. It doesn't matter if primary care or secondary care or what else, we are not preparing our young colleagues to do the job. We are very much educating them scientifically and we are very much educating them to learn quite a lot in, as far as knowledge is concerned. But we are not educating our young colleagues as far as communication and skills and attitudes of being a doctor is concerned. That is undergraduate training. (IntDE03)

The earliest point at which a student will experience practical training is two years after passing the first stage of his or her medical exam.[66] Furthermore, as noted above, there is a minimum requirement according to the licensing regulations for all medical students to undertake a two-week work placement in a GP practice. However, the degree to which different medical schools are implementing this work placement may differ across medical schools (IntDE01), an issue raised by most key informants:

> The minimum requirement in undergraduate training is that each student has a work placement of at least minimum two weeks in general practice. But it varies; in [university name] [they are] 2 weeks but I know of places…where it's 8 or 10 weeks in general practice. (IntDE03)

Focusing on general practice in particular, key informants highlighted that the final practical year does not, at present, include a mandatory placement in general practice. Placement in general practice is optional and the licensing regulations stipulate, in their most recent revision of 2013, that from October 2015 onwards, universities have to ensure that 10 per cent of enrolled medical students are being offered a placement in general practice. From October 2017, this will rise to 20 per cent, and the offer has to be extended to all medical students by 2019.[65] A recent position paper by the German college of general

practice and family medicine (*Deutsche Gesellschaft für Allgemeinmedizin und Familienmedizin*, DEGAM) highlighted this issue and recommended that the schedule that is currently in place (three four-month placements) should be changed to four placements, each lasting three months, in order to allow for an additional mandatory general practice placement.[280] There is an expectation that this change would increase the likelihood of students choosing this specialty and also enable those choosing other specialties to experience to the full range of conditions and settings that define general practice (e.g. chronically ill patients, patients with multi-morbidities, home visits). Experiencing a broader range of conditions and settings is seen to contribute to more 'holistic' medical education. These recommendations were principally supported by two major reports issued, respectively, by the German council of science and humanities (*Wissenschaftsrat*, WR) and the advisory council on the assessment of developments in the healthcare system (*Sachverständigenrat zur Begutachtung der Entwicklung im Gesundheitswesen*, SVR) mentioned earlier. Thus, the council of science and humanities, in its 2014 report on the development of medical education in Germany, recommended that the final practical year should be structured into four three-month placements to 'strengthen freedom of choice' for students, in addition to the subjects of internal medicine and surgery, which should remain mandatory. It did not, however, prescribe the options that should be offered.[142] The SVR (2014), while also supporting the quarterly structure of the practical year, recommended that general practice be added to the two mandatory subjects.[47] Among other things, this would necessitate including general practice in the final exam and thereby strengthen the visibility and relevance of this subject as a core part of medicine.

While general practice placements were seen to be desirable, key informants interviewed for this study highlighted some of the challenges in translating such a requirement into practice, namely, the need to identify (a sufficient number of) practices suitable for hosting students:

> [There is] big variation; here in my university…the practices who host the students are elected. I myself, I know the colleagues and I go to the practice and look at the rooms; I talk to them what is going to happen there. But I know that in other places this is just kind of taking all of the general practices from the phone book or from the register of, on the internet, just everybody can do it and a student goes there just looking around for two weeks and going back. (IntDE03)

There is a set of essential criteria that GP practices wishing to host a student have to fulfil and which are set by the German college of general practice and family medicine (DEGAM) but the implementation of this guidance can vary. GPs applying to host medical students are not formally trained in the supervision of undergraduates and 'they are not assessed on educational competencies for training' (IntDE03). At the same time, those applying tend to be motivated, wishing to 'give something back to the coming generations in terms of experience…that they have gained [themselves] in general practice' and seeking to promote 'exchanges with other teaching practices…[to] improve the image of and develop the subject of general practice in an academic way' (IntDE01).

Specialty training in general practice

General guidelines for specialty training in Germany are set out by the German medical association in the (model) specialty training regulations (*[Muster-]Weiterbildungsordnung*) mentioned earlier.[31] The responsibility for delivering and setting abiding standards based on this framework lies with the state

chambers of physicians. The framework describes the general requirements for specialty training in medicine to be undertaken 'at an approved specialty training facility under the direction of physicians authorised by the physicians' chamber'.[31] Specialty training in general practice as set out in the framework comprises three years of training in internal medicine in a hospital, of which 1.5 years may be spent in an ambulatory care setting (including general practice), plus two years of mandatory training in a general practice, of which about half a year may be spent in surgery. It also stipulates a requirement for trainees to undertake 80 hours of training in basic psychosomatic care. It further sets out the skills to be acquired, including a defined body of knowledge in internal medicine; skills and competencies in general practice, including disease prevention, early detection and long-term care; as well as diagnostic and treatment competencies such as electrocardiography, ultrasonography, spirometric assessment of pulmonary function, catheterisation techniques, and enteral and parenteral feeding, among others. Specialty training in general practice is scheduled to take a further five years following the *Approbation*, although in practice, GP specialty training tends to be longer, lasting around eight years.[47 50]

Training in general practice (and indeed any other specialty) is almost entirely 'training on the job' with no formal taught course element. This was highlighted in a 2009 report on specialty training for general practice commissioned by the college of general practice and family medicine.[86] Assessing GP specialist training at that time against what it referred to as 'the best EU standard of GP-training', the report noted that 'there seemed to be no overarching blueprint [in Germany], but a list of competencies that trainees needed to sign off on a regular basis. [M]ost of these competencies were technical e.g. ultrasound and to an outsider working in a different EU health system they seemed to bear little relation to the holistic patient centred generalist curriculum of a general practitioner' (p. 4).[86] Key informants interviewed for this study concurred with these observations in so far as they noted that the nature and content of what is taught during specialty training can vary (IntDE03).

For a GP practice to become a training practice, the GP will have to apply to the state physicians' chamber for authorisation, in line with the aforementioned general framework guiding specialty training set by German medical association. The framework specifies certain minimum requirements for physicians authorised to provide specialty training, noting that such authorisation can only be granted to those who themselves hold a qualification in the relevant specialist field, who are 'professionally and personally suitable', and who have demonstrable expertise in working in the specialist field for 'several years' following completion of their own specialty training.[31] The framework also sets out requirements for specialty training facilities, but these tend to be fairly broad. Thus, it stipulates that there should be a sufficient number of patients (in frequency and regularity) with diseases typical for the specialist field, that staffing and infrastructure of the facility should be consistent with medical advances and that hospital departments must demonstrate regular consultancy activities. The implementation of this general guidance is the responsibility of the state physicians' chambers, which implies that there may be variation across states.

With regard to specialty training in general practice, one key informant noted that '…there is no formal standard or formal requirement or even evaluation for the practice itself' (IntDE02). In a recent 'proposal for the assessment of the structural quality of training practices' the German college of general practice and family medicine (2013) pointed to 'disparate locally defined criteria' for the allocation of training

status to a practice.[281] It proposed a set of 19 criteria across 3 domains (trainer qualification, practice infrastructure and patient-specific factors) for the assignment of training practice status. These criteria have, however, yet to be tested with regard to feasibility and implementation.

Incentives for becoming a GP trainer for specialty training include the opportunity for the trainee to alleviate some of the working pressures of the GP trainer (IntDE02). Two key informants noted that it can be seen as a sign of 'quality' (IntDE05, IntDE02) for practices to be involved in training.

Table 11 shows the number of trainees in general practice between 2010 and 2012; in 2012, a total of 3,842 physicians were in training for general practice in the ambulatory care sector (full-time equivalent of 2,156 physicians). Of these, 72 per cent were women.[87]

Table 11 Number of physicians in GP specialty training (ambulatory care), Germany, 2010–2012

Year	2010	2011	2012
Physicians in specialty training in general practice (headcount)	3,258	3,483	3,842
Full-time equivalent	1,809	1,943	2,156

Source: KBV, DKG, GKV Spitzenverband (2013)[87]

A further key challenge for postgraduate training in general practice in Germany is a perceived lack of what has been referred to as 'vocational training schemes' with guaranteed posts, which would provide more predictable career prospects in general practice in particular.[86] At present, qualified physicians seeking to pursue specialty training have to organise the different rotations required for a given specialist qualification themselves, and in doing so they have to rely on the availability of relevant posts that would allow meeting these requirements. One key informant interviewed for this study also noted a perceived lack of continuity between under- and postgraduate training:

> There's no formal management of the transition [between undergraduate and specialty training]. It's the doctor, her or himself choosing a specialty. Looking for a place where you can achieve specialisation and then it's depending on your personal circumstances, if you have family, or you prefer a certain city, or area of the country. So there's no managed, management link in between ... (IntDE02)

A 2010 agreement between the main actors at the national level (providers and funders) sought to strengthen the conditions for training in general practice in Germany. It followed, and updated, earlier agreements (1999, 2001) that set out the financial framework for specialty training in general practice, which we describe in further detail in Section 5.4.3.[95] It also stipulated the establishment of coordinating points, known as *Koordinierungsstelle für die Weiterbildung von Fachärzten in der Allgemeinmedizin*, which were to be formed by the regional SHI physicians' associations and the state hospital associations. They were tasked with the organisation and coordination of specialty training in general practice at the state level, including, for example, assessing the quality of training institutions (GP practices and hospitals) and overseeing training schedules of trainees. According to the 2012 evaluation report of the agreement, 15 out of 16 federal states had established a coordinating point by 2012.[87] The

spectrum of services provided by these coordinating points varies, but typically involves information events (mostly targeting continuous medical education, but also medical students; information materials) or a job-market for physicians in specialty training. One of the central functions the coordinating bodies are tasked with is the organisation and coordination of specialty training in general practice at the state level, in particular for those trainees who are not covered in postgraduate training networks (*Weiterbildungsverbund*). In 2012, only about half of them had engaged in relevant activities, for example, arranging for the next training post. Furthermore, the coordinating bodies were asked to undertake surveys among trainees about the quality of postgraduate training in general practice but only a small number had done so.

Meanwhile, a small number of medical schools has established 'competence centres' that seek to provide training and mentorship opportunities for GP trainees and their trainers and to coordinate the training of GPs. Examples include those established at the universities of Frankfurt and Marburg[282] and the Heidelberg medical school.[283] The overarching aim of the centres is to strengthen general practice by promoting the development standards for medical education and training. In addition to providing a coordinating function to support those training in general practice, the centres also organise seminars for GP trainees and their trainers, offer a programme of mentoring to support trainees and trainers, and provide support and advice for the postgraduate training networks. The centres are currently supported by the respective state health ministries.

During their training, trainees must fulfil the points stipulated in the specialty training guidance, as described above.[66] Following completion of the training, the GP trainer will determine whether the trainee is ready for his or her final exam, which is taken as an oral examination before a committee gathered by the GP trainer before the state physicians' chamber, and which leads to specialist qualification in general practice.

Choosing general practice as a career

In 2012, there were 82 different specialist titles and directions in medicine. Of the approximately 12,000 graduates each year, only about 1,200 obtain a specialisation in medicine.[22] A comparatively low level of interest in pursuing general practice is reflected in a number of surveys of medical students. For example, according to the most recent national survey of medical students (2014), the proportion of those planning to specialise in general practice has remained low, at around 10 per cent.[147] In one other survey of 1,012 students in 7 cities across Germany in 2009, 96 per cent expressed a desire to pursue specialisation.[104] Of these, 7 per cent reported that they wished to pursue a specialisation in general practice; another 7 per cent gave general internal medicine as their preferred choice. Some 10 per cent of respondents reported setting up practice as a goal (90 per cent of those also gave general practice as their preferred choice); and of these, 22 per cent stated they would set up practice in a rural area (that is, 2.2 per cent of all respondents stating a career goal overall).[104] A multicentre prospective cohort study of medical students who had graduated in 2009 from seven medical schools found a slightly higher proportion of graduates with an interest in general practice, at 9 per cent, and a very small percentage overall wishing to practice in rural areas.[284]

A study by Schneider et al. (2013) of attitudes among medical students at three medical schools in the south of Germany identified a range of predictors for medical students to choose general practice as a

career path, whether in their own practice or as an employee. These included being female and having grown up in a rural area.[111] A further predictor was the presence of a chair in general practice. This issue was also discussed by some key informants interviewed for this study, who highlighted that only a proportion of medical school has established chairs in general practice (21 out of 36):

> Specialists in the faculties have their own preferences and that has an effect on the training. As long as there is no department for general practice then the subject is not represented there sufficiently. (IntDE01)

The 2014 national survey of medical students (representing some 13.5 per cent of all medical students that year), provides some further insights into motivations for (not) pursuing general practice as a specialist career choice.[147] This survey showed that general practice tends to have a fairly poor image. For example, more than half of those surveyed thought that GP earnings are low, and some 52 per cent also associated being a GP in an own practice with professional isolation.[23] At the same time, about half felt that general practice was interesting and varied, although some 20 per cent disagreed ('[general practice] is something for the block-headed, I need something more sensible').

5.4.2. Governance

The overall governance of medical education and training in Germany is characterised by different actors that are responsible for different aspects, from admission to undergraduate education and postgraduate specialisation.

The prerequisites for becoming a member of the medical profession in Germany are set out in the 1987 medical practitioners' act (*Bundesärzteordnung*), with the licensing regulations for physicians (*Approbationsordnung*) regulating undergraduate medical training in terms of general structure and content.[65] As noted earlier, the *Approbationsordnung* sets out the general requirements for the content of education at the undergraduate level, describing the knowledge and practical skills that are to be achieved as part of the curriculum. While setting the overarching framework, the regulation leaves some degree of freedom for individual medical schools in implementing the curriculum. Furthermore, since 1999, it has been possible for medical schools to implement 'experimental curricula' (*Modellstudiengang*, model course) to test whether different approaches to delivering the education and training goals set out in the overarching framework may be more suitable to train medical graduates compared with the traditional approach to medical education.

Differing approaches to implementing the licensing regulations at the state level have led to wide variation in the contents and structure of medical education across Germany. Three broad groups can be distinguished: the traditional approach to medical education and training, which separates the preclinical from the clinical stage, as broadly outlined in earlier sections of this report; reformed courses that have introduced changes to the preclinical and clinical training parts but that have retained the principal separation between the two; and model courses.[142 285] The majority of medical schools have retained the traditional approach, although several have introduced innovative elements to the courses offered, such as problem-based learning, evidence-based medicine or e-learning. In 2014, 9 out of 37 medical faculties operated model courses.[142] As a consequence of these developments, medical studies vary widely across Germany.

At the specialisation level, the framework for training is set by the German medical association, as mentioned above, and it is implemented by the state chambers of physicians (which also oversee the final exam), without involvement from the medical schools. The separation of responsibility between the medical schools and the physicians' chambers was commented on by a range of key informants interviewed for this study, with some recognising the potential for medical schools to be more involved in further training, given their role and 'competencies…in education and curriculum development' (IntDE03), but there are both structural and political challenges in creating such collaborations.

5.4.3. Financing

Undergraduate medical education is generally free of charge for students,[94] although students have to make a regular contribution of typically between €150 and €300 per half year (*Semesterbeitrag*); grants and student loans are available.

Regarding specialty training in general practice, financial support was first introduced with the 1998 act to strengthen solidarity in statutory health insurance, the *GKV-Solidaritätsstärkungsgesetz*, which stipulated that during 1999 and 2000 SHI funds were to contribute to the financing of specialty training placements in general practice of around €1,000, providing that, for placements in the ambulatory care sector, the relevant regional SHI physicians' association contributed the same amount.[146] The maximum number of (financially supported) placements in general practice was set at 3,000 for 1999 and at 6,000 for 2000. From 2001 onwards, the level of the financial contribution to be made by SHI funds and the number of placements was to be negotiated by the national associations of SHI funds, the national association of SHI physicians (KBV), and the German hospital federation (DKG), in consultation with the German medical association. The level of financial support was to be calculated in a way that it would ensure an 'adequate reimbursement' for trainees. The maximum number of placements to be supported was set at a minimum of 5,000; however, while it has been increasing over time, in 2012, the number of full-time places supported under this scheme was only 3,531.[87]

These stipulations were developed further in the 2008 healthcare reform. This reform led the aforementioned actors at the national level and the national association of private health insurers to revisit their 2001 agreement and introduce further incentives to promote specialty training in general practice.[95] The new agreement, which was published in 2010, concerns structural measures as well as financial incentives. Structural measures include, for example, the aforementioned establishment of coordinating bodies at the state level to help organise and coordinate training at the regional level; they are also committed to evaluate the progress of implementation of the agreement. Financial measures included, from 2009, an increase in financial support for placements in ambulatory care from €2,040 to €3,500 (for a full-time trainee post), with the costs to be covered by the health insurers and the regional SHI physicians' associations. To further encourage training in underserved areas, financial support could be increased by €500. The total amount spent on the programme in 2012 was just over €90 million (compared with €76 million in 2010).[87]

5.4.4. Quality standards for medical education and training

During preclinical education, national guidelines are set for general content of the curriculum, but the implementation and precise content can vary across medical schools. Quality assurance during preclinical

education and the internships in general practice can vary among universities, since the standards for education are also set locally.

As noted earlier, responsibility for specialty training lies with the regional physicians' chambers. The German medical association has set out general guidelines for further medical training in the different specialties.[98] All trainees must fulfil the criteria in the training regulations set nationally and contextualised at the state level by the regional physicians' chambers. Once the GP trainer confirms that the trainee has satisfied the criteria and is ready for examination, a brief oral examination with a committee of three physicians (two of whom are qualified specialists in the area of assessment) will take place.[66]

5.5. Stakeholder views on the current system

Available evidence highlights dissatisfaction among GP trainees with the current approach to specialty training in general practice in Germany, in particular, a perceived lack of structure and learning goals within the postgraduate medical education system.[86 286] This is an issue that has also been highlighted for specialty training in Germany more generally.[287] One key informant interviewed for this study noted that the university was not currently well suited to steer career choices, pointing to a 'reductionist' approach to the teaching of medicine (IntDE03). One other key informant highlighted the need to expose students to the 'realities' of clinical practice in ambulatory care settings early on, noting that students and faculty were not always aware of the social aspects of medicine and their importance in determining good quality of care (IntDE06). Thus, exposure to primary care through practical experience was noted to be beneficial even to those pursuing other specialties:

> I think there are more universities accepting it and realising that training in primary care is not only for those students who later on are going to primary care…but it's also necessary for those students to who later on go to specialisation; cooperation with primary care doctors and family physicians is an essential part of patient care and I think some universities and more and more universities are realising they have to do something about it. (IntDE03)

A number of key informants highlighted potential challenges to the current approach to specialty training in general practice, noting a perceived lack of central oversight of standards and quality assurance. The aforementioned 2009 report by the German college of general practice and family medicine (DEGAM) highlighted the likely benefits of formulating a set of 'end-stage' competencies for a fully trained GP.[86] The introduction of elements of curriculum based on the Canadian CanMEDS syllabus may be one way of introducing competency-based curriculum for general practice. This is currently being piloted and will be evaluated in 2014.[288] One key informant suggested that medical schools that have a department for general practice could provide a 'driving force' (IntDE02) to contribute to the coordination and monitoring of GP specialty training.

When considering broader issues around the degree to which the current approach to medical education and training meets the changing population health needs in Germany, key informants commented that the opportunities created for specialty training in Germany lack consideration of such needs:

> We have a mismatch of the offer of specialisation, opportunities and the need we see in the daily service for a patient on the ambulatory care side, which is from my understanding a huge gap. It's a really totally disconnected from the need of the population. (IntDE02)

One key informant pointed to the potential impact of these developments vis-à-vis scarce resources in future, although this view was not necessarily shared among the study participants:

> I am quite sure that scandals will happen…what is happening now and for the year to come is that resources are being shortened and shortened and shortened and especially human resources in the country is being very sparse resource. It will be not so many doctors around and when you have shortage of resources some scandals are going to happen. (IntDE03)

Overall, all participants expressed a sense of urgency in attracting medical students to general practice,

> [The main issue] is more about quantity right now [of general practitioners].… Our main issue these days is having the right mix of skills. And of specialties and having also doctors who are not really interesting in hyper-special infection but also have fun talking to people, caring about, caring for families, making home visits, and being more in the social area of medicine, not in the high-tech area of medicine. (IntDE02)

Existing studies have pointed to comparatively low levels of interest on the part of medical graduates to pursue a career in general practice, and for working in rural or remote areas in particular, as highlighted in earlier sections of this chapter. These findings have been confirmed by a recent survey of members of the Marburger Bund, a union representing salaried physicians,[287] and the aforementioned national survey of medical students, undertaken in 2014.[23]

The challenges to attracting a sufficient number of medical students into general practice, and the need to strengthen primary care within medical education and training more broadly, have been recognised and are being addressed through a number of reform activities in Germany. These include the 2013 agreement of the new coalition government, which has made medical education and training a priority area, arguing, among other things, for the strengthening of general practice and for the support of postgraduate training in general practice to be increased by 50 per cent.[141] The 2014 report by the German council of science and humanities called for the strengthening of integrated curricula that are patient-oriented, a focus on training that is competency-led and team-based, and an emphasis on general practice as a core part of the curriculum through, for example, the institutionalisation of general practice at medical schools.[142] The most recent report by the advisory council on health (SVR), also issued in 2014, went perhaps furthest, placing particular emphasis on the strengthening of general practice along the entire medical education and training pathway, with recommendations targeting both undergraduate and postgraduate training, from admission to medical school and increasing the role of general practice in undergraduate training, to the establishment of a coordinated and specifically (financially) resourced system of postgraduate training.[47]

6. The Netherlands

6.1. Health system context

In the Netherlands, healthcare system governance is shared by the government and corporatist actors. Traditionally based on statutory health insurance, in 2006 the Dutch healthcare system moved to a mandatory, regulated private insurance system. The healthcare system is, however, still considered a social health insurance system because the core principle of solidarity is being upheld. Private, for-profit health insurers have to accept new applicants and are not permitted to differentiate their premiums on the basis of age, sex or health risks.[37] In 2012, SHI constituted the main source of funding for healthcare, accounting for 72.6 per cent of total health expenditure. Total expenditure on health was 12.4 per cent of GDP.[150]

The Dutch healthcare system can be distinguished into curative care; long-term care and public health, which is governed by municipal health services; and social care. The health insurance system comprises four elements: mandatory social health insurance for long-term care (continuous care for chronic conditions), which is regulated by the exceptional medical expenses act (*Algemene Wet Bijzondere Ziektekosten*, AWBZ) and mainly financed through income-dependent contributions; basic health insurance covering essential curative care, which is regulated by the health insurance act (*Zorgverzekeringswet*, Zvw), and financed by a flat-rate premium and an income-dependent contribution; complementary voluntary health insurance for services that are not covered under these 2 schemes; and the 2007 social support act (*Wet Maatschappelijke Ondersteuning*, Wmo), which made municipalities responsible for the governance and provision of preventive care and social care that had traditionally been financed by the AWBZ. Thus, the Dutch cure and care sectors are governed at the central level, while social care and preventive care have been delegated to local governments.

Prior to the 2006 reforms, the government was responsible for directing the healthcare system, but its role has now shifted towards safeguarding the provision of healthcare by overseeing the quality, accessibility and affordability of care. Insurers, healthcare providers and patients are responsible for organising the healthcare system. Professional associations play an important role in the healthcare system through self-regulatory measures, including re-registration schemes and quality improvement through the development of professional guidelines.[37]

Private providers are responsible for delivering most healthcare services in the Netherlands. Public health services in the 29 municipalities provide preventive care, including disease prevention, health promotion and health protection. General practitioners are primarily responsible for the provision of primary care, although a number of other healthcare providers also work in primary care. GPs act as gatekeepers for

hospital and specialist care, and access to specialist care is restricted to those with referrals. Specialist care is mainly provided in hospitals, while long-term care is provided in nursing homes, residential homes and home care organisations.[37]

6.2. Primary care

Primary care in the Netherlands is defined as generalist care that comprises general medical and pharmaceutical care, alongside nursing care and allied health services, as well as non-specialised mental and social healthcare.[289] General practitioners play an important role in the delivery of primary care. Since 2006, all Dutch citizens have been required to register with a general practitioner.[290] GPs generally serve as the first point of contact in the healthcare system, treating the majority of patients seeking primary care and acting as gatekeepers to the rest of the healthcare system by controlling access to secondary and tertiary care through referrals. GPs also provide out-of-hours care through a national network of GP posts. In order to be permitted to work as general practitioners, medical doctors undergo specialised training in family medicine and then work as general practitioners.[37]

6.2.1. Characteristics of practices

Traditionally, GPs in the Netherlands have worked in solo practice, but there has been a recent trend for GPs to work in group practices with other primary care providers.[37] Most GPs in the Netherlands work in private practices and are self-employed.[49] In 2012, there were 4,917 general practices; of these, 47 per cent were solo practices and 18 per cent were group practices with three or more GPs. In 2012, the GP density was about 40.1 to 44.1 per 100,000 population.[42-44]

Willcox et al. (2011) estimated that between 85 per cent and 90 per cent of GP practices employ at least one part-time practice nurse.[290] As the size of the practice increases from solo to duo and group practices, the likelihood that the practice will have a practice nurse increases.[289] General practices also increasingly employ mental health nurses, with 25 per cent of general practices employing at least one mental health nurse in 2006. In addition to taking on more medical staff, it is now common for practices to also employ practice managers. The growing number of personnel employed by general practices is a consequence of the increasing responsibilities being given to the GP. The gatekeeping role is expanding, and the demand for care is increasing. Additional medical personnel are needed in general practices to maintain a high level of care as well as a balance in GPs' workload.[291]

As noted earlier, GPs also provide out-of-hours primary care in GP posts that are centrally located throughout the Netherlands in each of the municipalities.[290] GP outposts were introduced in 2000, after having been initially piloted.[292] This care is organised through regional cooperatives and funded under the basic care package.[290] Cooperatives receive additional payment from health insurers for the treatment of patients with chronic diseases and for the employment of additional personnel. According to Willcox et al. (2011), GP cooperatives have been successful at improving access to after-hours primary care, with 97 per cent of practices reporting arrangements for patients' after-hours care to see doctors and/or nurses. The development of GP posts is also reported to have led to a substantial increase in job satisfaction among GPs and a decrease in workload, relative to the prior out-of-hours care system.[292]

6.2.2. General practice workforce

In 2011, there were 11,235 practising GPs in the Netherlands. Of these, 78 per cent were self-employed and 11 per cent worked as salaried GPs. In 2012, 48.9 per cent of GPs were over 50 years of age.[43] As noted above, most GPs work alone or in group practices. Physiotherapists, pharmacists, psychologists, dentists, nurses and midwives also work in primary care. In addition, community pharmacists work in collaboration with GPs to provide services in specific geographic areas.[37] However, the occupational structure of primary care in the Netherlands has changed over time. A number of new primary care occupations, or specialisations within existing occupations, have been created to help general practitioners with clinical treatment, educating patients, and providing patient support. For example, there has been a great deal of specialisation in nursing between nurses who work in general practice and nurses who work in specialised clinics.[289] There has also been specialisation between professions, resulting in the creation of new primary care occupations, such as nurse practitioners and physician's assistants. Individuals in these new occupations are increasingly performing tasks that would have traditionally been restricted to the GP only.

6.2.3. Distribution of GPs

Data from a 2012 survey showed that GPs are relatively evenly distributed throughout the Netherlands (Table 12), and accessibility to GPs was reported to be high.[43] At the same time, Schäfer et al. (2010) noted a mismatch between demand and supply of healthcare services in some parts of large cities.[37]

Table 12 Geographical distribution of GPs in the Netherlands, 2012

	Men		Women		TOTAL	
	Total	per cent	Total	per cent	Total	per cent
Highly urban	918	18.0	847	22.4	1765	19.9
Very urban	1402	27.5	1053	27.9	2455	27.7
Somewhat urban	1020	20.0	750	19.8	1770	19.9
Low urban	1137	22.3	784	20.7	1921	21.6
Non-urban	618	12.1	346	9.2	964	10.9
TOTAL	5095	100.0	3780	100.0	8875	100.0

Source: van Hassel and Kenens (2013)[43]

Evidence from the early 2000s shows that patients tended to be satisfied with the accessibility of general practitioners overall but were less satisfied with certain aspects of healthcare delivery, such as waiting time for an appointment or being able to speak with the practitioner on the telephone.[293] More recent findings from a 2013 survey by the Commonwealth Fund highlights how accessibility, as such, has remained high, while the proportion of Dutch respondents who reported forgoing care because of the cost of care has increased, from 6 per cent in 2010 to 22 per cent in 2013.[294] The authors attributed this increase to austerity pressures, which led the Dutch health insurance system to allow cost sharing to

increase. A study by the Ministry of Public Health, Welfare and Sport showed that those who forgo care are often unaware of what is, and what is not, covered under the basic insurance package.[295]

There is some evidence from the early 2000s that recent medical graduates prefer to work in less urban settings. For example, 39 per cent of recent graduates preferred to work in urbanised rural settings, and this preference has remained stable over time.[296] The same study showed that, in the early 2000s, 15 per cent of medical graduates were willing to work in less well-off areas, compared with 56 per cent who were not, which is an increase compared with the mid-1990s. There was some suggestion that preference for working in certain areas was associated with the location of students' GP training. For example, students who completed their GP training in Amsterdam were more likely to work in socially-deprived areas (40 per cent) than students from other schools; graduates from Leiden were the least likely to work in socially-deprived areas (18 per cent).

6.2.4. Workforce policies for the provision of primary care nationally and locally

In 1972, the *numerus clausus* (the number of students to be enrolled into medical school) was introduced to reduce the costs associated with training and to limit the oversupply of physicians. The Ministry of Education, Culture and Science is responsible for setting the *numerus clausus*, with advice from the Ministry of Public Health, Welfare and Sport. The advisory committee on medical manpower planning (known as the *Capaciteitsorgaan*) serves as an independent advisory committee to the Ministry of Health on health workforce planning. It uses a simulation model that was developed by the Dutch institute for health services research (NIVEL) to determine existing gaps between the demand for, and supply of, health professionals and to forecast the future demand and supply. The model's outputs inform recommendations by the Capaciteitsorgaan to the Ministry of Public Health, Welfare and Sport on the required intake of health professionals into training programmes.[49] The ministry then assesses the feasibility of funding the required number of medical positions and allocates the funding to the eight medical schools.[297]

In an evaluation of health workforce planning in the Netherlands, using GP planning as an example, Greuningen et al. (2012) concluded that health workforce planning has likely led to a balance between supply and demand of GPs in the Netherlands.[49] They found that an estimated shortage of GPs of 5 per cent in 2000 was reduced to close to zero by 2010. They also found that vacancies in general practice were low in 2010, at 1.7 vacancies per 100 GPs, and that most GPs were able to find the desired type of practice in 2010, with 6.5 per cent searching, compared with 7.2 per cent in 2000. Finally, GP density has remained stable, with 2,350 residents per full-time equivalent GP in 2009, compared with 2,438 in 2000.

Incentives to encourage GPs to work in underserved areas

GPs working in socio-economically deprived areas, as defined by an index of deprivation, are eligible for income supplements.[298] The programme is administered by the national GP association (*Landelijke Huisartsen Vereniging*, LHV) and the health insurers Netherlands (*Zorgverzekeraars Nederland*, ZN). Approximately €10m is made available per year for socially deprived areas, which are primarily located in the poorer areas of major cities.[25]. The income supplement seeks to compensate GPs working in deprived areas for their higher workload, which is due to higher levels of morbidity and increased

complexity of care among populations in socially deprived areas. Although the main objective of the income supplement is to maintain high quality care in all areas, it is suggested that the funds serve to maintain enthusiasm among GPs practising medicine in these areas.[298]

6.3. Regulatory context for ensuring and improving quality of primary care

6.3.1. Licensing

The Dutch healthcare professions act (Wet BIG) of 1993 governs the registration and licensing of healthcare practitioners. According to this act, all individuals who have been licensed by their respective professional association and BIG-registered (that is, registered under the Dutch healthcare professions act) are allowed to work in the provision of healthcare. However, there are some stipulated restrictions and protected titles. Each association of medical specialists in the Netherlands has its own licensing procedure, which functions in parallel with the Dutch healthcare professions act.[37]

The central college of medical specialists (*Centraal College Medische Specialismen*, CCMS) sets the requirements for medical courses, teachers and institutes and determines which specialties are recognised medical specialties. The medical specialists registration commission (*Medisch Specialisten Registratie Commissie*, MSRC) licenses physicians and implements the decisions of the CCMS. In January 2013, the MSRC was merged with the social doctors registration commission (*Sociaal Geneeskundigen Registratie Commissie*, SGRC) and the registration commission for general practitioners (Huisarts en Verpleeghuisarts Registratie Commissie, HVRC) to form the registration commission medical specialists (*Registratiecommissie Geneeskundig Specialisten*, RGS). [299] GPs can begin the registration process with the medical specialties registration commission up to eight weeks before the anticipated completion date of their GP training. The medical specialties registration commission then may take up to eight weeks to register the applicant.[102]

The Dutch medical association (*Koninklijke Nederlandsche Maatschappij tot Bevordering der Geneeskunst*, KNMBG) is responsible for the accreditation of medical specialists, including GPs. In 2005, the Dutch college of GPs introduced a system of accreditation for general practice.[290] This accreditation scheme comprises 187 criteria. The assessment includes a self-assessment, a face-to-face evaluation and a practice visit. Individual GP practices are benchmarked against other practices. However, this accreditation scheme is voluntary, and by 2012, only about 30 per cent of practices had completed accreditation.[300]

6.3.2. Revalidation

There is also a mandatory re-registration scheme for physicians in the Netherlands. In order to be eligible for re-registration, physicians must have completed a minimum number of hours of continuous medical education courses. Physicians are free to choose which courses they attend, such that the topics followed reflect their professional interests. However, there is an increasing trend towards continuous professional development, which is the process that describes the structured acquisition of knowledge, skills and attitudes to improve specific competencies. Since 2009, GPs also must complete 40 hours of training per year and at least 10 hours of peer review activities to be eligible for re-registration. Since 2011, GPs must

also participate in a visitation programme. If GPs do not meet the minimum re-registration requirements, they may be removed from the register of their association of medical specialists.[37]

6.4. Key components of education and training of medical doctors

6.4.1. Pathway for education and training for general practice

In the Netherlands the training pathway for general practice takes nine years (Figure 10). It involves three components: three years to obtain a bachelor's degree ('undergraduate' programme), three years to obtain a master's degree as well as formal MD qualification and three years to complete GP specialty training (specialty training lasts between two and four years, depending on the specialty). After obtaining an MD, most medical doctors spend some time in the 'interim period' before admission to specialist education. These doctors work as non-specialist doctors under the supervision of other specialists.[301]

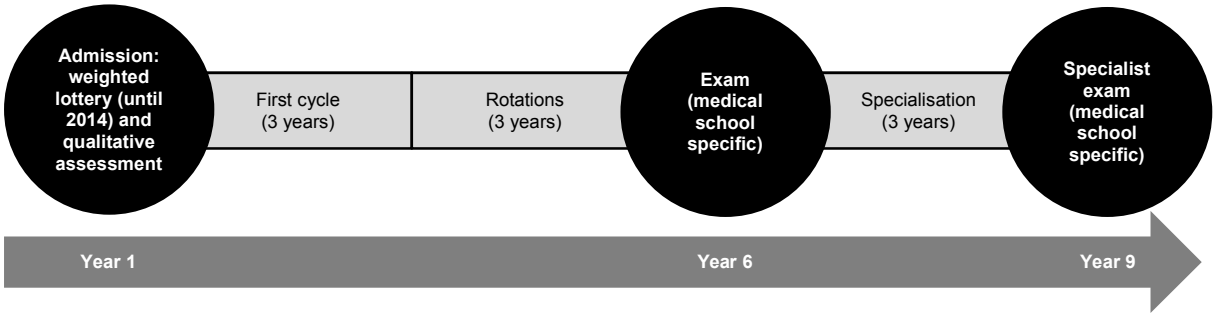

Figure 10 Medical education and training pathway for general practice in the Netherlands

Admission to medical school

The Netherlands employs a strict system for entry into medical school. Eligibility for medical studies requires an upper-level secondary education degree in the subjects of physics, chemistry, biology and mathematics, and students must pass a national examination in each of these subjects.[302]

The Ministry of Education, Culture and Science decides yearly upon the request of the eight medical schools to subsidise a certain number of medical students (*numerus fixus*, currently 3,050). Students can be admitted to medical school in one of two ways.

The first way is through the national lottery procedure. Applicants wishing to study medicine are assigned a random number by the *Dienst Uitvoering Onderwijs* (DUO), a branch of the Ministry of Education, Culture and Science, according to the number of applicants. This number is then adjusted downwards by the grade the student obtained in the aforementioned national school exam. The resulting 3,050 applicants with the lowest number are then admitted to medical school. Thus, the higher the grade achieved in the national exam, the lower the resulting (lottery) number and the higher the chances of being admitted to medical school. Students can participate in the national lottery up to three times,[303] although some medical schools, such as Maastricht, only permit two rounds of application through the lottery.[304] Students with an average national exam grade higher than 8 out of 10 will typically be admitted to medical school.

The second way is through a decentralised selection process. The number of students that medical schools wish to admit through this route is deducted from the 3,050 who can enter through the lottery procedure,

although schools will have to reserve a certain proportion of lottery placements in order to guarantee access for those applicants with a national exam grade higher than 8 out of 10. The decentralised admissions process is a qualitative competitive selection procedure, administered by the individual medical school, which determines the selection criteria for the qualitative competitive selection. There is some debate about the relative merits of the different selection processes.[305] From 2014, admission to medical school is based solely on the decentralised selection process.[55] Students with a prior bachelor's degree in biomedical sciences are eligible for graduate entry into medical school, which may consist of either a four-year course at Utrecht University or Maastricht University or entrance halfway into a six-year course at the other Dutch medical schools.

Bachelor's and master's degrees

Undergraduate medical education is a six-year programme in the Netherlands, with a three-year bachelor's component and a three-year master's component. In practice, the full six-year programme appears to be commonly viewed as one programme, even though Dutch legislation formally distinguishes these two programmes as distinct components (IntNL01).

The curriculum for undergraduate medical training is based on the Dutch framework for medical education, formerly the 'Dutch blueprint for medical education'. First released in 1994 and updated twice since (2001, 2009), the framework sets out the national objectives for medical education in the Netherlands.[63] It identifies seven core competencies: medical expert, communicator, collaborator, manager, health advocate, scholar and professional, but it does not detail how much time should be allocated to any particular competency or task.[69] Guided by the overarching framework, each of the eight medical schools then sets the specific curriculum. This may lead to variation in the way the curriculum is developed and delivered at each university. For example, some medical schools may place a greater emphasis on clinical education, while others emphasise theoretical courses. Some medical schools may offer clerkships, while others may offer more elective courses. One key informant interviewed for this study noted how, despite this variation, there has been an overall trend towards earlier clinical education over the past 10 years (IntNL01).

Throughout undergraduate medical training, one day or half a day per week is dedicated to training in physical examination skills, communication skills, professional behaviour and clinical reasoning.[64] Every year, each cohort of students sits an identical MD-level test, which allows students to evaluate their own progress. Most medical schools also offer clinical experience throughout undergraduate medical education. For example, many universities offer some first-year mandatory nursing aid work, patient-adoption programmes, junior clerkships or early regular clerkships.[64] However, most clerkships take place in the master's programme of medical education. The majority of clerkships take place in university medical centres or in other hospitals. According to one key informant, most schools also provide for a mandatory general practice clerkship of six to eight weeks' duration (IntNL01). For example, the University of Utrecht and the University of Rotterdam both have such provisions for general practice clerkships.[306 307]

Assessment

In order to graduate, students take a final exam that is set by their respective medical school; there is no national exam. Following successful completion of their undergraduate medical training, students receive both a master's degree and an MD. Medical graduates can then formally register as a medical doctor. One key informant noted that, while newly qualified medical doctors may legally prescribe medication, they may otherwise only work under supervision until they have completed specialty training (residency period).[69] Many graduates undertake 'non-residency' work for a period of six months to one year following registration to gain experience in other specialties, such as family medicine or emergency medicine, before applying for specialty training or while waiting for admission to their preferred specialty. The non-residency work undertaken during this 'interim period' will then be considered when they apply for specialty training (IntNL01).

Specialty training in general practice

Following successful completion of the undergraduate programme and the obtaining of an MD qualification, medical graduates may go on to pursue specialty training. The number of graduates that can enrol in each medical specialty is regulated at the national level by the Ministry of Public Health, Welfare and Sports.

Specialty training in general practice takes three years.[64] The Dutch medical association is responsible for postgraduate medical education, accreditation of medical specialists (including GPs) and promoting professional standards for different specialists.[100] The medical specialisms board determines the education and training requirements for all 33 specialisms, including general practice. The national association of GPs, which is a member of the Dutch medical association, together with the Dutch college of general practitioners (*Nederlands Huisartsen Genootschap*, NHG) develop guidelines for GPs.[308] Each of the eight medical schools is then responsible for organising postgraduate GP training for its students.[83] Competency-based training, based on the Canadian CanMEDS framework, was introduced into all specialty training in 2007.[37]

Approximately 30 per cent of medical graduates pursue postgraduate training in general practice.[37] Previously, application for GP specialty training was through the individual medical school. As of 2014, the application process for general practice is centralised and administered by the Dutch training institute for general practitioners (*Huisarts Opleiding Nederland*).[84] Medical doctors wishing to pursue postgraduate GP training must now submit their application to the institute. The application is reviewed by a selection committee, who decide whether applicants will continue on through the selection process. The remainder of the selection process, involving a knowledge-based exam and a STARR-interview consisting of the components situation, task, action, result and reflection, is also determined by the institute but carried out by the individual medical schools.[84] Those who have been successful in their application but have not been admitted into GP training because of a lack of places available are placed on a reserve list and reconsidered in the next selection round. Or they are offered positions elsewhere where there are vacancies. One key informant noted that if students are accepted into GP training at a particular medical school but choose to forgo their spot, they must wait two years before they can reapply for a training place (IntNL03). To be eligible for selection, the applicant must be registered with the BIG-register and must possess a recognised MD qualification.[84]

Assessment of GP trainees is centrally organised by a committee of the eight universities. All Dutch GP trainees must sit the (national GP knowledge test) at fixed intervals throughout their postgraduate training. Students should pass this exam at least once a year. The test is set according to a blueprint that covers all aspects of clinical care, using the different chapters of the *International Classification of Primacy Care*.

Each of the eight medical schools has a general practitioner training institute, which provides taught courses in general practice. Throughout the three-year training period, GP residents attend medical school one day per week and spend the remaining days working in a clinical setting. The first and third years of GP training are spent working in a GP practice.[49] Medical schools have prearranged agreements with accredited GP training practices, and together they are responsible for making the arrangements for the placement of GP trainees into specific GP practices.[85] The second year of training takes place in three different healthcare institutions: six months in a general hospital, three months in a psychiatric hospital and three months in a nursing home.[49] National organisations (e.g. the national association of GPs, together with the Dutch college of general practitioners and the foundation for vocational training of GPs (*Stichting Beroeps Opleiding Huisartsen*, SBOH, see below)) organise an annual 'new starter' day with workshops that are specifically aimed at recent graduates.[308]

Key informants interviewed for this study highlighted that there had previously been problems with the distribution of training places for postgraduate GP training in the Netherlands, with a greater demand for training places in the central and western parts of the country compared with the north and the south (IntNL01, IntNL02, IntNL03, IntNL04). They also noted that, while there had been an oversupply of applications to the western parts of the country and unfilled vacancies in the north in 2012 and 2013, some applicants tended to re-apply for training positions rather than taking a place at a less preferred medical school. According to one key informant, the aforementioned reforms are seeking to address this problem by introducing a temporary 'ban' on reapplying, as described above (IntNL03). However, it is not yet clear whether this new approach will be more effective in addressing the uneven distribution of GP trainees.

More recently, the Dutch Minister of Public Health, Welfare and Sport agreed with several partners representing the specialist medical care sector on a national volume cap of 1.5 per cent in specialist care in 2014. For the period 2015–2017, this would equate to a maximum of 1 per cent per year.[309] According to one key informant interviewed for this study, this could mean that hospitals might be reluctant to fill vacancies and GP trainers might have to take on additional trainees from hospitals (IntNL03).

GP trainers and GP training practices

In 2013, there were 2,262 accredited GP training practices in which doctors could receive their specialty training, with an estimated 1,500–1,800 GP trainers.[310] The national association of GP educators *Landelijke Huisartsen Opleiders Vereniging*, LVOH) is responsible for ensuring the quality of GP trainers. The organisation sets the standards and competencies for GP trainers as well as the accreditation rules for GPs.

In January, 2013, a national plan for the education and examination of GP trainers (*Landelijk Plan Scholing en Toetsing Huisartsopleiders*) was implemented.[311] This plan sets out an educational plan with a set of six core themes that are relevant for GP trainers, including transferring one's own expertise, creating a learning environment in the practice, provide content-related guidance, testing and reviewing progress of the students, or guiding the students' learning process. GP trainers develop the required competencies by taking part in a 'curriculum' for GP trainers, which varies according to the trainer's experience (ranging from beginner to expert). GP trainers receive a minimum of 48 hours of training per year. The full GP trainer training process takes place over four years. Throughout this training process, there is a strong focus on personal feedback, which students, colleagues and the training institute all provide to the trainer. GP trainers are assessed through the national evaluation of GP trainers, the *Landelijke Evaluatie Opleiders Huisartsgeneeskunde* (LEOH), which is mostly based on feedback from the trainer's students. Students complete this evaluation twice a year. Applicants for GP trainer status must have been practising for a minimum of five years, with the last full year having taken place in their current practice, and they must have completed specific training courses.[312] Trainers also attend eight days of training per year at the GP training institute located at each of the medical schools. During these training sessions, trainers undergo didactic education programmes and programmes to learn to assess their trainees and give them feedback.[313] The general practice institutes at the medical schools are well informed about GP training in the clinical settings because they have regular contact with both the trainees and the trainers.[311] GP trainers must also go through a re-accreditation process every five years. In order to become re-accredited, GPs need to meet a number of criteria. For example, they need to pass an exam and show that they have practiced for a minimum of 0.5 full-time equivalent.[314]

There are a number of incentives for becoming a GP trainer that extend beyond increased remuneration, including the use of an extra 'free' assistant, the opportunity to stay up-to-date on innovations in medicine, the opportunity to critically self-evaluate, the opportunity to gain valuable experience and the opportunity to shape medical education through contact with students and training institutes.[315] A 2008 survey found that most common reasons for becoming a GP trainer were that training was perceived to be enjoyable and fulfilling and that working with a young colleague was perceived to be challenging and refreshing.[316]

Motivations for choosing primary care as specialty

A small number of studies have examined the socio-demographic profile of Dutch medial students who choose to specialise in general practice. For example, Heiligers (2012) reported female gender to be an important predictor of choosing general practice as a specialty, with life-circumstances, such as living with a partner, also important.[317] The latter finding only held for students in the second phase of their undergraduate training. In a related study, Maiorova et al. (2008) noted that gender differences in preferences for GP training were not significant after accounting for the characteristics of GP work and preferred patient categories.[318] Examining preferences before and after the clerkship period, they also found that clerkships in GP practices had an impact on males' preferences for choosing general practice, increasing their likelihood of choosing this specialty by 38 per cent (compared with 22 per cent among females). The authors concluded that attitudes towards GP work and preferred patient category were the most important factors in choosing general practice as a career choice.

In a further study, Mairova et al. (2008) examined differences between medical schools in the proportion of students choosing general practice specialisation.[149] They found that, on average, 23.5 per cent of medical students entered GP training but that there was no clear relationship between a medical school's degree of orientation towards general practice in the undergraduate curriculum and the decision to enter general practice. The authors concluded that personal factors and employment opportunities were likely more important predictors of the decision to pursue GP training.

6.4.2. Governance

Medical education and training in the Netherlands is governed by a range of organisations. Key actors include the Dutch medical association (KNMBG), the association of medical specialists (*Orde van Medisch Specialisten*, OMS) and the Dutch college of general practitioners (NHG). The Dutch medical association is responsible for postgraduate medical education, accreditation of medical specialists (including GPs) and promoting professional standards for different specialists.[100] Its medical specialism board (*College voor Geneeskundig Specialismen*, CGS) determines the education and training requirements for all 33 specialisms, including general practice. The national association of general practitioners (LHV), which is a member of the Dutch medical association, together with the Dutch college of general practitioners, are responsible for developing guidelines for GPs.[101]

Governance of medical schools takes place through the schools' councils, which are responsible for determining the minimum requirements necessary to attain a bachelor's and master's degrees of medical science.[37] At the level of specialty training, the medical specialism board (CGS) at the Dutch medical association sets the requirements for medical courses, teachers and institutes and determines which specialties are recognised medical specialties. The general practitioner registration committee (Huisarts en Verpleeghuisarts Registratie Commissie, HVRG), which became part of the newly established registration commission medical specialists (*Registratiecommissie Geneeskundig Specialisten*, RGS) in 2013, (re-)licenses physicians and implements the decisions of the medical specialism board.[102]

6.4.3. Financing

The Dutch Ministry of Education is responsible for the financing of undergraduate medical education, although students are required to pay an annual fee of approximately €1,850 each year.[91] Financing of undergraduate medical education in the Netherlands consists of a basic student grant, an additional student grant, a student travel card and a student loan. Students apply for the additional grant and the loan separately.[319] The level of funding available through these three mechanisms is shown in Table 13. The total level of financing available to students depends on whether they live independently or with their parents. Students may also apply for additional funding, on top of their standard monthly funding. The additional funding that students are eligible to receive depends on their parents' income and household size.[320] However, if students do not obtain their degree within 10 years, they are required to repay the additional grant.[320] International students must pay to study medicine in the Netherlands. Many students work additional jobs throughout medical school to supplement the allowance they receive through scholarships, but it is uncommon for students to take out loans to finance their education.[64]

Table 13 Monthly funding available for undergraduate medical education in the Netherlands, 2014

	Living independently	Living at home
Basic grant	€279.14	€100.25
Additional grant	€258.35	€237.46
Loan	€295.73	€295.73
Tuition fee loan	€152.92	€152.92
TOTAL	€986.14	€786.36

Source: Dienst Uitvoering Onderwijs (2014)[321]

All medical graduates who are successfully admitted to postgraduate GP training are employed by the foundation for vocational training of GPs (*Stichting Beroeps Opleiding Huisartsen*, SBOH), which receives funding from the Ministry of Public Health, Welfare and Sport. All medical doctors wishing to specialise in general practice must apply to the SBOH for funding. Those entering GP training must also pay a registration fee of €375.00 to enter the training register.[92] The SBOH is responsible for financing four different aspects of medical training and practice: employer costs of training doctors to become specialists, the cost of training institutes for the theoretical education within the training, the cost of trainers, and developments and innovation in quality and cooperative projects.[314]

6.4.4. Quality assurance

A number of organisations are involved in ensuring the quality of specialty training in the Netherlands. This involves, at undergraduate level, the medical schools delivering education and, at the postgraduate level, the royal Dutch medical association (*Koninklijke Nederlandsche Maatschappij tot Bevordering der Geneeskunst*, KNMG), the national association of general practitioners (*Landelijke Huisartsen Vereniging*, LHV), the Dutch college of general practitioners (*Nederlands Huisartsen Genootschap*, NHG), the foundation for university training of GPs (*Stichting Verenigde Universitaire Huisartsopleidingen*, SVUH), the registration commission medical specialists (*Registratiecommissie Geneeskundig Specialisten*, RGS), and the national organisation of GPs in training. Quality of postgraduate training is overseen by the (registration commission for general practitioners (*Huisarts en Verpleeghuisarts Registratie Commissie*, HVRC), which is now part of the aforementioned registration commission of medical specialists (RGS). The national association of GP educators (*Landelijke Huisartsen Opleiders Vereniging*, LHOV) is responsible for ensuring the quality of GP trainers; it sets the standards and competencies for GP trainers as well as the accreditation requirements.

Surveys are regularly conducted among GPs and their trainers to assess their satisfaction with postgraduate general practice training.[97] Specifically, the survey of GP trainers assesses whether or not they feel comfortable and competent as GP trainers in regards to many different aspects of their role as trainers.[316] A complementary survey of GP trainees is conducted after each year of their training, in which trainees reflect on a number of aspects of their training, such as knowledge and experience gained,

perceived quality and relevance of their training, and perceived level of training and support received. The results of these two surveys are communicated to the training institutes in the medical schools so that the medical schools can adjust their curriculum or take action if a particular GP trainer does not seem to be performing well.

6.5. Stakeholder views on the current system

As highlighted in the introduction to this chapter, the accessibility of GPs in primary care in the Netherlands is generally not considered an issue of concern, as documented by a recent evaluation of workforce planning.[49] This view was also shared by a number of key informants interviewed for this study:

> We regularly look at the density of GPs and the regional differences there are, and factually there is no place in the Netherlands where you could say, well, there is a structural problem in terms of a shortage of GPs. (IntNL02)

However, there was some concern among key informants regarding GPs' level of preparedness to deal with an ageing population. One concern, in particular, was the increasing workload for GPs as a result of the complexity of caring for older people and more stringent gatekeeping:

> The practice is getting very, very busy now and what you've seen in the last years is that they get more and more supporting staff also to cope with this increasing patient flow. So what they have, for instance, is nurse practitioners for chronic disease and this hasn't been…for 10 years this was not very common in a GP practice and now every GP practice has a nurse practitioner or a physician's assistant who takes care of the diabetes patients, the COPD [chronic obstructive pulmonary disease] patients, etc., and do all these checks that need to be done on a regular basis. But now these mental problems and the gatekeeping activities with regard to mental diseases also comes to the GP practices as well. And the GP also needs to coordinate home care and self-management and social care, etc. And then the fear is that that is too much for, as I say, the common GP. And so the concern is whether the future GP is equipped to handle this complex and diverse and heavy workload. (IntNL02)

At the same time, among key informants interviewed for this study, the quality of medical education and specialty training in the Netherlands was regarded as high, with the introduction of competency-based learning seen to have been a positive and modernising development in medical education. One key informant emphasised the intensity of GP training in the Netherlands and stressed the importance of maintaining flexibility in the educational system and curriculum to cope with future changes in patients' needs (IntNL02).

The same key informant also expressed a high level of satisfaction with GP trainers in the Netherlands (IntNL02). This was also shown in an evaluation of GP trainers, published in 2005, which gave the average score awarded to GP trainers as 7.8 on a 10-point scale, ranging from 7.4 to 8.0 across the different medical schools.[322] It was further noted that GP trainers were satisfied with their role in postgraduate training for GP and the support they received from the medical schools and the foundation for vocational training of GPs (SBOH).[316] However, one key informant cautioned that there is a

shortage of GP trainers in the Netherlands and that some medical schools had not been able to fill all the allocated training spots because of an insufficient number of trainers and training practices, noting that 'we need training practices, that's the bottleneck' (IntNL04).

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Appendix A: Data collection template

Best Practice: Medical Training from an International Perspective - KBV

Template for data collection

1.1 System overview

1.1.1 Organisation and financing and delivery of primary care

1.1.2 Recent reforms of the health and social care systems

1.1.3 Policies for provision of primary care nationally and locally

1.2 Primary care

1.2.1 Different types of care at primary care level

1.2.2 Workforce available for providing primary care

1.2.3 Characteristics of practices

1.2.4 Accessibility

1.3 Regulatory context for ensuring and improving quality of primary care

1.3.1 Licensing, re-validation and accreditation of primary care clinicians

1.3.2 Mechanisms and tools to encourage establishment of practice in rural, remote or socio-economically deprived areas

1.4 Key components of education and training, including postgraduate training of medical doctors

1.4.1 Medical career pathway

1.4.2 Institutions that award medical degrees

1.4.3 Innovative approaches to medical education

1.5 Core functions applying to medical education systems

1.5.1 Governance/stewardship

1.6 Ensuring appropriate provision of primary care in sparsely populated or economically weak regions

1.6.1 Mechanisms

1.6.2 Evaluations of mechanisms

Appendix B: Interview topic guide

About medical education and training

1. Ageing populations and the rising burden of chronic disease present challenges to all countries. Thinking about *medical education and training* in particular, how well do you think does your country currently prepare the medical workforce to address these challenges?
2. Who is involved in determining the nature and scope of medical *education*? How does this differ for undergraduate and postgraduate education?
3. Who is involved in determining the nature and scope of medical *training*? How does this differ for undergraduate and postgraduate training?
4. Focusing on the postgraduate period, who *delivers* education and training and in what setting?
5. How are medical education and training financed? How does this differ for undergraduate and postgraduate training?
6. Please consider the transition points between the different phases of the education and training pathway discussed earlier. According to you, how well are these phases coordinated? What works and what does not work during transition from one phase to the other?
7. How well do you think does the approach to education and training of physicians in your country align with the way health services are organised and provided? How well do you think are physicians prepared to deliver services once they have completed their training?

About medical education and training in relation to care supply

8. More generally, how well do you think do the education and health systems in your country interact with each other in order to align medical education and training with service organisation and delivery?
9. Returning to the opening question, are there any proposals or activities towards changing or reforming the education and training in your country to (better) prepare the medical workforce to address the challenges of an ageing population?

Appendix C: Key informants' roles and affiliations

Role	Organisation*
England	
Academic General Practice	University of Cambridge
Senior official	Department of Health/ Health Education England North West
Academic	Royal College of General Practitioners
Senior official	Health Education East of England
France	
Senior official	Regional administration (Agence régionale de santé Loire)
Senior official	National physicians' organisation
Senior official	National physicians' organisation
Senior official	National association of medical students
Academic Internal Medicine	Paris 6 University
Academic general practice Senior official	National association of general practice lecturers
Germany	
Academic General Practice	University of Frankfurt
Senior official	National association of SHI physicians
Academic General Practice	University of Ulm
Academic General Practice	University of Hamburg
Academic	University of Frankfurt
Netherlands	
Senior official	Dutch institute for health services research
Senior official	Centre for research and development of education
Academic	University of Amsterdam
Senior official	Committee on medical manpower planning

Academic	University of Utrecht

NOTE: *Several key informants fulfilled multiple roles as, for example, academic researchers, lecturers and members of advisory boards or professional associations. We here provide the primary affiliation of key informants only.