

Primary care in 34 countries:

perspectives of general practitioners and their patients

**Primary care in 34 countries:
perspectives of general practitioners and their
patients**

**Eerstelijnszorg in 34 landen:
perspectieven van huisartsen en hun patiënten
(met een samenvatting in het Nederlands)**

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1

General introduction

General introduction

This thesis aims to evaluate primary care service delivery in Europe and in other parts of the world. Strong primary care is expected to meet the current challenges of healthcare systems which are facing increasing numbers of people with chronic diseases and rising healthcare costs [1].

The thesis is written in the context of the international study 'Quality and Costs of Primary Care in Europe' (QUALICOPE). The countries studied include 26 EU member states as well as Australia, Canada, Iceland, FYR Macedonia, New Zealand, Norway, Switzerland and Turkey. As primary care is the point where many patients enter the professional healthcare system, easy access and a generalist approach to the health problems people present are important features.

The generalist approach implies that health problems are clarified, diagnosed and treated as far as possible and that patients are referred or given guidance when other healthcare services need to be involved [2,3]. Primary care services can be delivered by a variety of providers such as nurses, general practitioners (GPs), pharmacists, physiotherapists, psychologists and social workers [3-6].

In the countries studied in this thesis, GPs are the core providers of primary care services [3]. In the large majority of these countries, GPs have completed a specialised training in family medicine¹.

In the countries studied, GPs practise almost exclusively in an outpatient setting [7]. As suggested by the title of this thesis, primary care is evaluated from the perspectives of both GPs and patients. This covers how GPs describe their work, e.g. how they organise their practices and what type of services they deliver.

The evaluation from the patient perspective includes how they assess the care they receive. Patients' assessments have become more important during recent decades in the evaluations of healthcare systems and services. Without taking account of these assessments, it is too easy for care delivery to stay provider-centred [8].

¹ In some of the countries, the doctors are called family physicians, family practitioners or family medicine specialists. In this thesis we refer to all these doctors as GPs.

The main question addressed by this thesis is:

How can we explain differences within and between countries in the strength of primary care in terms of the breadth of GP service profiles, and how does this relate to assessments by patients?

This introductory chapter provides information on the background, research questions, hypotheses and methodology used in this thesis.

Background

Challenges of health care systems

Healthcare systems are currently facing a variety of challenges including increasing numbers of people with chronic diseases and rising healthcare costs. Driven by the available evidence, strong primary care is seen as part of the solution for these challenges [1]. Due to various changes, healthcare systems are being challenged to keep achieving their main objectives, which include improving the health of the population, being responsive to the needs and expectations of the population and providing protection against the costs of ill health for the population [9]. Demographic developments have led to a shift in the nature of health problems from acute and infectious diseases to non-communicable, lifestyle-related and long-term diseases [1,10]. In the coming years there will be further increases in the prevalence of diseases such as diabetes mellitus, chronic obstructive pulmonary disease (COPD) and depression, as well as a growing number of people with multimorbidity [11]. Moreover, the ageing population means that the availability of the future healthcare workforce is being threatened: the proportion of people of working age will decrease but they will have to deliver healthcare for a larger number of elderly [12,13]. Due to demographic and technological developments, the absolute and relative spending on healthcare are increasing in many countries [4]. As resources spent on healthcare cannot be used elsewhere in society, societies are constantly facing questions about the optimum size of healthcare budgets. Governments are trying to contain healthcare expenditures while tackling the challenge of keeping the population protected against healthcare costs in an equitable manner and also maintaining the quality of care [4]. A final

important change in healthcare systems relates to the changes in the position of patients. More often than before, today's patients have the possibility of preparing for consultations by looking up medical information about their disease and its potential treatments on the Internet. This may reduce the information asymmetry between professionals and patients. Patients have the option of having a more active and well-informed role in the decisions to be taken about a treatment plan [14], even though this may not be equal for all groups of patients. Healthcare providers need to be able to adapt to these changes. As a response to these changes, decision makers in many countries have focused on strengthening the role of primary care within healthcare systems. This policy direction resulted from the growing evidence about the potential benefits of primary care and has been encouraged internationally by the World Health Organisation (WHO), starting with the 1978 Declaration of Alma Ata [15]. More recently, the WHO stressed the importance of good primary care in the document "Primary Health Care - Now More Than Ever" which was published in 2008 [1]. A recent report published by the European Commission also addressed positive expectations regarding the potential of strong primary care in coping with the current European health systems' challenges [4].

Strong primary care and responsiveness to patients' needs and expectations

Previous studies found that, in countries with stronger primary care, the healthcare system performs better [16-31], which makes it a potential solution addressing various healthcare system challenges. The current evidence also has several gaps. There is for example only limited evidence on how specific elements of strong primary care relate to patients' assessments. This thesis focuses on patients' assessments of primary care as outcomes that are related to the responsiveness to patients' needs and expectations. This section explains what 'strong primary care' is and what is known about the relationship with responsiveness to patients' needs and expectations.

Primary care in a country is characterised as strong when it contains a set of characteristics related to the service delivery process and to its supporting structure [5,14]. First, primary care needs to be accessible, i.e.

close to where patients live and without (for example) financial restrictions. Moreover, patients need to be able to visit their primary care doctors for a broad range of problems and health needs, i.e. the service delivery needs to be comprehensive. Thirdly, it is important that the care is continuous, which means that the doctor needs to be able to take the medical history and the personal living situation of patients into account. Finally, primary care providers need to be able to guide their patients through the healthcare system, e.g. in cases of referral [5,14]. A strong supporting primary care structure is characterised by pro-primary care economic conditions at the national level, strong national governance (e.g. in terms of a policy vision specifically for primary care), and national workforce developments that support primary care [5]. Findings in the literature regarding the relationship between strong primary care and the responsiveness to patient expectations and needs are inconclusive. When looking at the responsiveness to patients' needs, measured as the health of populations, strong primary care is generally found to have a positive outcome [23,32-34]. Recently, a Europe-wide study concluded that people with chronic conditions were more likely to be in good or very good health in countries with a stronger primary care structure and better coordination of primary care [35]. Some studies have looked at the responsiveness of strong primary care in terms of patient satisfaction. Patient satisfaction was found to be lower in countries where the access to specialists services was regulated through gatekeeping [36,37]. However, previous research did not find associations between stronger primary care and patients' general ratings of the quality of primary care [33].

Even though many studies have been performed and valuable evidence has been generated, there are gaps in the information currently available. Firstly, most studies so far have focused on the higher-income OECD countries. In this study, we aim to explore whether the same outcomes of stronger primary care can be found in European countries with lower incomes. Moreover, as we have included 34 countries in this study, we will be able to evaluate the influence of country-level characteristics on primary care outcomes. The second gap relates to the scope of previous studies: most have been performed either at a highly aggregated level or covering only very detailed aspects of primary care. This study aims to

provide an overview of primary care in 34 countries and to study the functioning of primary care systems in detail. Finally, many studies into patient related outcomes so far have focused on health outcomes. In this study we evaluate the patients' assessment of quality in primary care.

The breadth of GP service profiles

This thesis focuses on the breadth of GP service profiles as a core element of the process of primary care. If GPs in a country offer a broader range of services, it is more likely that primary care will meet the needs of the population [5,38]. When services are too limited, preventable illnesses may not be avoided or illnesses may last longer than needed [38]. Moreover, patients are more likely to visit GPs for many problems if they know these services are available. During recent decades, many countries have chosen to shift services from secondary or hospital care towards primary care settings [39]. This may have led to a broadening of GP service profiles.

The services delivered by GPs can be divided into four major components:

- 1) treatment tasks;
- 2) minor technical procedures;
- 3) preventive services, and
- 4) first contact care [5,40-41].

Treatment tasks comprise service delivery largely for chronic health problems, e.g. depression or Parkinson's disease. Minor technical procedures include tasks such as excision of warts and wound suturing. Preventive services delivered in general practice include e.g. health education, screening and case finding. First contact care concerns the services that address problems for which people will first consult their GP instead of medical specialists [42,43].

A broad range of services offered within primary care is associated with improved health outcomes [23,33,44,45], lower hospital admission rates for primary care sensitive conditions [23,33], reduced disparities in health [46] and cost-effectiveness [23,44]. The PHAMEU (Primary Healthcare Activity Monitor Europe) study, performed in 31 European countries, showed that countries where GPs had broader service profiles had slower growth in total healthcare expenditure per capita between 2000 and 2009 [33] and the self-rated health of patients with more than

two chronic conditions in these countries was higher than in countries with GPs with narrower service profiles [35].

The multi-country perspective

Potentially, decision makers from different countries can learn from each other. The countries studied in this thesis vary greatly in terms of the organisation of their healthcare systems, primary care and the service delivery. This variation makes it possible to analyse whether certain aspects of the organisation and delivery of primary care are related to the experiences of patients regarding the accessibility and continuity of care [10]. Additionally, new evidence is needed on how primary care systems function. Various large international studies have been performed previously into primary care in European countries, including the 1993 European Task Profile Study of GP services, the 1999 European Task Force on Patient Evaluations of General Practice Care (Europep) study [47] and the 2009 Primary Healthcare Activity Monitor Europe (PHAMEU) study [48,49]. The first two generated detailed knowledge about primary care from the GP and patient perspectives, but were conducted in the 1990s. There have been many health care reforms in European countries since then. The PHAMEU study was conducted more recently and collected data at an aggregated level.

This thesis builds upon the knowledge generated in the earlier large studies in order to provide new information about the state of primary care in 31 European and three non-European countries.

To be able to learn from other countries, policy makers need to be able to see what elements and configurations of primary care are associated with better outcomes related to goals of healthcare systems.

The variation between the countries studied makes it possible to study these relationships. This will be done by studying the variation within and between these countries and by identifying conditions that potentially explain this variation.

Research questions

The aim of this thesis is to evaluate determinants and outcomes of primary care service delivery by GPs in 34 countries. The study distinguishes between the perspectives of patients and GPs. The main question that will be answered is:

How can we explain differences within and between countries in the strength of primary care in terms of the breadth of GP services profiles, and how does this relate to assessments by patients?

To answer this main question, the following sub-questions were formulated:

- 1) *How can primary care service delivery by GPs be evaluated?*

This question will be addressed in the first part of this thesis (chapters 2 and 3), in which the design and measurement instruments of the QUALICOPC study are described. Further analyses are carried out as part of this study.

- 2) *How can differences in and between countries in the breadth of GP service profiles be explained?*

This question will be addressed in the second part of this thesis (chapters 4 and 5). Chapter 4 will examine changes in the breadth of GP service profiles over recent decades, while Chapter 5 provides explanations for the current variation in the breadth of GP service profiles.

- 3) *How are the differences in the strength of primary care associated with patients' assessments of primary care?*

This question will be addressed in the third part of this thesis (chapters 6 and 7). In Chapter 6, the characteristics of the primary care structure are related to the assessments of patients and Chapter 7 analyses the relationship between the breadth of GP service profiles and patients' assessments.

Why GP service profiles and patient experiences vary

Framework of this thesis

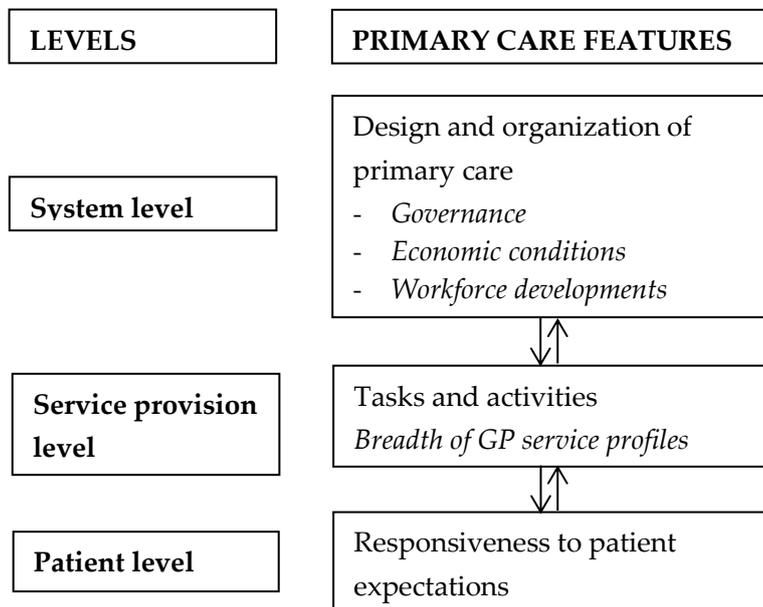
Differences in primary care at different levels of the healthcare system will be explored in order to answer the research questions. Moreover, characteristics that could potentially influence these differences will be evaluated. Figure 1 provides a framework distinguishing between three levels of primary care:

- 1 the system level, representing characteristics of the supporting structure of primary care in a country. This comprises e.g. the way primary care is financed and regulated;

- 2 the service provision level, covering characteristics of the GP practice organisation and the type of services that are delivered (the service profiles);
- 3 the patient level, where the users of services experience whether the care provided responds to their needs and expectations.

These levels are expected to be interrelated. It is, for example, expected that the breadth of GP service profiles is influenced by characteristics of the primary care structure and that the experiences of patients are influenced by the type of services delivered by GPs. The breadth of service profiles may in turn also affect the design and organisation of primary care at the national level, but this will not be studied in this thesis. This thesis focuses on how the characteristics at higher levels influence lower levels. The relationships studied in this thesis will be explained in the following sections.

Figure 1: Features of primary care and their interrelationships



GP service profiles: changes over time explained

The second part of this thesis will study the variation within and between countries in the breadth of GP service profiles. Firstly, there is a study of the extent to which national circumstances are associated with changes in the breadth of GP service profiles during the past decade. In this chapter, the breadth of GP service profiles in European countries is compared between two points in time: 1993 (using data from the European Task Profile study) and 2012 (using data from the QUALICOPC study). The following three hypotheses were formulated:

Hypothesis 1: GP service profiles expanded more between 1993 and 2012 in countries where the urgency for reform oriented towards primary care was higher due to:

- *a stronger increase in the percentage of people above the age of 65 between 1993 and 2012;*
- *a stronger increase in healthcare expenditure between 1993 and 2012;*
- *a decrease in life expectancy in the early 1990s;*
- *and a less strong family orientation in the population of the country.*

The greater the urgency of a problem, the greater the political will to put it on the policy agenda [50,51]. A decreasing life expectancy in many transitional countries² in the early 1990s created an urgency to reform healthcare systems. The increasing costs of healthcare in western countries also created an urgency to counteract these increases by, for example, strengthening primary care.

Hypothesis 2: GP service profiles expanded more between 1993 and 2012 in countries with a more interventionist policy for strengthening primary care due to a longer period of government by left-wing parties.

This hypothesis relates to the political composition of governments, which is expected to influence the will to address a problem in a country. Strong primary care requires interventionist policies [52]. Left-wing governments are more in favour of state intervention than right-wing and liberal governments [50].

² Transitional countries are the countries which were formerly under the communist regime. These countries are Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Slovakia.

Hypothesis 3: GP service profiles expanded more between 1993 and 2012 in countries with better means to strengthen the GP service profiles due to:

- *a higher level of government effectiveness;*
- *more centralized government;*
- *and a higher professional status of GPs in those countries.*

If countries have better resources, they will be more able to reform their health services. If government is more centralized, they will be more able to aim at major reforms than when decisions concerning health care in a country are made at decentralized levels. A higher professional status, consisting of e.g. a professional association and the establishment of specialized education, is expected to influence GP service profiles positively. In these countries, the tools are being provided to offer a broader range of services, e.g. through education [53]. A general assumption underlying all three hypotheses is that policy makers in European countries have aimed to strengthen primary care as a solution for various challenges. As explained in section 1.1, the breadth of service profiles of GPs in a country is a core indicator of the strength of primary care in a country.

Explanation of variation in GP service profiles in 2012

The second part of this thesis will try to explain why GPs in certain countries or practices have broader service profiles. The following hypothesis relates to the potential influence of the national level:

Hypothesis 4: GPs will have broader service profiles in countries with a pro-primary care national organisation.

The national primary care organisation can help GPs acquire broad service profiles by means of pro-primary care governance. The role of GPs can for instance be supported by having the tasks of GPs described in a national law or policy document.

Secondly, the characteristics of GPs and practices are expected to relate to the breadth of GP service profiles. These characteristics are divided into five main elements: the vision of GPs, the type and quantity of resources available in the practice, the structure of the practice organisation, the professional and administrative arrangements of the practices and the environment of the GP practices. A hypothesis has been formulated for each of the components of GP service profiles:

Hypothesis 5: GPs will have broader service profiles in first contact care when

- *conditions for the accessibility of their practice are beneficial due to more resources being available in their practice and better organisational processes facilitating accessibility and availability of care;*
- *the GP has a more community-oriented vision.*

Hypothesis 6a: GPs will have broader service profiles in treatment of diseases when there is greater availability of human resources.

GPs who work with supporting staff have the opportunity of delegating tasks and can pay more attention to the treatment of patients [54,55].

Hypothesis 6b: GPs will have broader service profiles in treatment of diseases if they are paid according to the volume of services provided, which is more likely if they work on a self-employed basis instead of a salaried basis.

Even though economic gain may not be the first aim of GPs, self-employed GPs have better opportunities to maximise profits by behaving entrepreneurially compared to salaried GPs [52].

Hypothesis 7: GPs will have broader service profiles in minor technical procedures if they have greater availability of technical and human resources.

As with the treatment of diseases, the availability of human resources is expected to be conducive to carrying out such services. Practice nurses, for example, can be involved in the application of procedures [56]. Furthermore, having the equipment available can enable and motivate GPs to provide these services [42].

Hypothesis 8: GPs will have broader service profiles in terms of preventive services when they have:

- *a more comprehensive medical records system in which records are kept routinely;*
- *and a more community-oriented vision.*

Preventive services include health education and health check-ups. These services can be enhanced by the availability of a good medical records system, as this can help a GP thanks to its functionality for identifying and monitoring patient groups at risk [42-56]. The medical records system can also be used for monitoring individual patients with chronic diseases [56]. It is important that medical records are high quality, contain the necessary information and are kept routinely in

order to support such tasks. GPs with a more community-oriented vision are expected to also feel more responsible for prevention.

Variation in the patient assessments of care explained

The third part of this thesis studies explanations for variations in patients' assessments of quality of care. Five main quality domains are accessibility, continuity, comprehensiveness, patient involvement in decision making and doctor-patient communication. These are all aspects of 'person-focused' care, which means that GPs focus on a 'whole person' rather than on a 'patient', i.e. their health conditions [57]. The strength of primary care is expected to be related to the quality of care as perceived by patients:

Hypothesis 9: Patients will perceive more person-focused care in countries where GPs are more likely to be involved in a broad spectrum of health problems in various stages of their lives.

The stronger involvement of GPs is expected to increase continuity of care and providers' responsiveness to the patients' values regarding continuity, comprehensiveness and communication. Patients will use services more readily if they know a broad spectrum of care is offered [1].

Finally, it is expected that patients' assessment of primary care quality is associated with the breadth of the service profiles of their GPs:

Hypothesis 10: Patients will experience better quality of care from their GP if they can build a more long-standing relationship with their GP because that GP has a broader service profile.

This long-standing relationship can be built up because the patients are more likely to encounter their GP during different stages of their lives if GPs offer broader service profiles. Moreover, patients are more likely to visit GPs for many problems if they know these services are available. Long-standing relationships mean that GPs can become aware of importance of the various aspects of quality of care as perceived by patients [58].

Study design and methods

Multilevel design

This thesis is based on the data collected in 34 countries in the context of the QUALICOPC study, which is coordinated by NIVEL (the Netherlands Institute for Health Services Research) and co-funded by the European Commission under the 7th framework programme. The QUALICOPC study has a multilevel design, distinguishing between the levels of countries, GP practices and patients. Data has been collected in such a way that patient data can be linked to the data of the GP they visited. This makes it possible to perform multilevel analyses that allow variation to be ascribed to the various levels. Moreover, using this methodology means that characteristics at the various levels can be used in the statistical models as explanatory variables.

Data collection process

Surveys were held among GPs and their patients in 34 countries (26 EU countries plus Australia, Canada, Iceland, FYR Macedonia, New Zealand, Norway, Switzerland and Turkey). The study originally only included the European countries, as it was performed within the FP7 Framework Programme of the European Commission. At the start of the study, the project's researchers found various partners in their networks who were interested in carrying out a comparable study in their own countries. Partners in four extra countries (Australia, Canada, FYR Macedonia and New Zealand) were able to secure funding. Despite several attempts, the researchers did not succeed in including France in the study.

Data collection took place between October 2011 and December 2013. In each country, the target was to get a nationally representative sample of GPs (target: N= 220 GPs; Cyprus, Iceland, Luxembourg and Malta N=80 GPs, because of the small size of the countries) and patients (target: N=2,200; Cyprus, Iceland, Luxembourg and Malta N=800) to fill in the questionnaires. In Turkey, Spain, Belgium and Canada, larger samples were taken in order to enable comparisons between regions. Only one GP per practice or health centre was eligible to participate. The aim was to avoid having multiple GPs from the same practice who are under the influence of the same circumstances and therefore not independent of each other.

GP questionnaires were filled in either on paper or electronically (online or via a tablet). In nearly all countries, trained field workers were sent to the participating GP practices to collect patient data using paper questionnaires. In Belgium, the patients filled in the survey on a tablet. In parts of Sweden and Norway, Denmark, England, Canada and New Zealand, local practice staff were instructed in how to distribute and collect patient surveys on paper according to the study protocol.

The field workers and practice staff were instructed to ask a series of patients 18 years or older who had had a face-to-face consultation with the GP to complete the questionnaire until 10 questionnaires per practice were collected. Nine patients in every practice completed the questions about their experiences in the consultation which had just occurred. One questionnaire included questions about the patient's values regarding primary care. These proportions were chosen because previous studies found that large variations between patient experiences can be expected within a country, but less variation in what they find important [59].

A questionnaire on patient experiences was filled in by 61,931 patients and what was referred to as a patient values questionnaire by 7,270 patients; the GP questionnaire was completed by 7,183 GPs (database version 4.2, November 2014). Further explanations about the data collection can be found in Chapter 2.

Measurement instruments

Four questionnaires were developed for collecting the data among GPs and their patients: one for GPs, one for patients relating to their experiences, one for patients relating to what they find important (their values) and one to be completed by the field workers. The development and content of the questionnaires is described in Chapter 3.

Recruitment of GPs and patients and response rates

In the majority of the countries (23,) a national random sample was taken or the whole population of GPs was approached. Alternative samples were taken in the other countries such as Spain and Poland, where random samples were taken in pre-selected regions. The response rate of GPs varied from less than 10% in Australia, Austria, Belgium, Canada, Germany, Ireland and Sweden to more than 80% in Iceland, Malta and Spain. Patients were sampled randomly by including the first 10 patients

in each practice who agreed to participate in the survey. The response rates of patients varied from 54% in Poland to 88% in Portugal. Details of the sampling and response rates can be found in Appendix 1.

Ethical approval and inform consent

Ethical approval was acquired in accordance with the legal requirements in each country. The surveys were carried out anonymously. Appendix 2 provides information about the ethics committee in each country. Depending on the national requirements, written or verbal informed consent was requested. The general procedure was that GPs were invited by letter, e-mail or telephone and gave their consent to participate in the study. Patients were invited by the field worker or practice staff to complete a questionnaire. All participants were informed about the study and participation was voluntary.

Statistical analyses

Statistical models for hierarchically structured data in multilevel models were used. This approach is used when units are nested within larger (higher-level) units; such as patients within GP practices, or GPs within a country's healthcare system. Using these models allowed variation in (e.g.) patients' perceived quality of care to be divided into three parts:

- a part related to the individual patients;
- a part related to the primary care practices they visit;
- a part related to the healthcare system of the countries [60].

The use of multilevel statistical analysis is essential in this thesis, in particular where associations between country, practice and patient characteristics are analysed. This method means that associations with characteristics at different levels can be analysed at the same time. Moreover, the method accounts for differences in sample size between (in this case) GP practices and countries. As well as multilevel analyses, single-level regression and correlations were used to analyse the relationships at the country level.

Latent variable models were used to construct scale scores used in further analyses. The econometrics approach was used for aggregating data at a higher level. This approach accounts for differences in the number of respondents on which the estimation is based, individual differences in response to certain items, and for dependency among the items that

measure the latent variable [61, 62]. In the multilevel model, an additional level is added for the related variables or items that the scale is made up of. A three-level model was used for the questions of the GP questionnaire (items nested within GPs, and GPs nested within countries) and a four-level model for questions of the patient questionnaire (items nested within patients, patients nested within GPs and GPs nested within countries). A weighted item average was used for each item to calculate an average scale value. This was done by using the item weightings for the fixed effects. Finally, the item variance (an indication of the measurement error) was taken into account [61,62].

Use of other data sources

Besides the data from the QUALICOPC study, two other main data sources were used in this thesis:

- data from the 1993 European Task Profile study [48]. In this study, the service profiles of GPs in 30 European countries were mapped among samples of GPs in each country. This data was used for comparison with the 2012 situation;
- data from the PHAMEU study in which aggregated data on primary care in 31 European countries was collected [63]. For the purpose of this study, additional data was collected for Australia, Canada, New Zealand and FYR Macedonia using the same indicators as the PHAMEU study.

Content of the chapters

This thesis consists of three main parts. In the first part (Chapters 2 and 3), the study design and development of the questionnaires are described. Part 2 (Chapters 4 and 5) focuses on the breadth of GP service profiles. Chapter 4 describes and explains changes in the breadth of GP service profiles between 1993 and 2012. Chapter 5 goes into the determinants of the breadth of GP service profiles at the country and GP practice levels. Part 3 (Chapters 6 and 7) focuses on the patients' perceived quality of primary care. In Chapter 6, country characteristics are related to these outcomes, while Chapter 7 focuses on the relationship between the breadth of GP service profiles and patient perceived quality. Finally, Chapter 8 provides an overall discussion of the study results.

References

- 1 World Health Organization. The World Health Report 2008: Primary Health Care - Now More Than Ever. Geneva 2008.
- 2 Boerma WGW, Dubois CA. Mapping primary care across Europe. In: Saltman RB, Rico A, Boerma WGW, eds. Primary care in the driver's seat? Organizational reform in European primary care. Berkshire: Open University Press, 2006:22-47.
- 3 Health Council of the Netherlands. European Primary Care. The Hague, 2004.
- 4 European Commission EXpert Panel on effective ways of investing in Health. Definition of a frame of reference in relation to primary care with a special emphasis on financing systems and referral systems. Brussels: European Commission: DG Health & Copnsumers, 2014.
- 5 Kringos DS, Boerma WG, Hutchinson A, et al. The breadth of primary care: a systematic literature review of its core dimensions. *BMCHHealth ServRes* 2010;10:65 doi: 1472-6963-10-65 [pii]; 10.1186/1472-6963-10-65 [doi] [published Online First: Epub Date].
- 6 Starfield B. Is primary care essential? *Lancet* 1994; 344(8930):1129-33.
- 7 Grumbach K. To be or not to be comprehensive. *Annals of family medicine* 2015;13(3):204-5 doi: 10.1370/afm.1788 [published Online First: Epub Date].
- 8 Haggerty J. Measurement of primary healthcare attributes from the patient perspective. *Health Policy* 2011;7(Spec Issue):13-20.
- 9 Murray CJL, Frenk J. A WHO Framework for Health System Performance Assessment. Geneva, Switzerland: World Health Organization, 1999.
- 10 Schäfer W, Groenewegen PP, Hansen J, et al. Priorities for health services research in primary care. *Quality in primary care* 2011;19(2):77-83.
- 11 Social and cultural planning office. Social and Cultural Report 2000. The Hague: Social and cultural planning office, 2000.
- 12 European Union. Green Paper on the European Workforce for Health. Brussels: European Union, 2008.

- 13 Organisation for Economic Co-operation and Development (OECD). The looming crisis in health workforce: how can OECD countries respond? Paris: OECD, 2008.
- 14 Boerma W, Kringos D. Introduction. In: Kringos D, Boerma WGW, Hutchinson A, Saltman RB, ed. Building primary care in a changing Europe. Copenhagen: World Health Organization, the European Observatory on Health Systems and Policies, 2015.
- 15 World Health Organization. Declaration of Alma Ata. International Conference on Primary Health Care. Alma-Ata, USSR, 1978.
- 16 Friedberg MW, Hussey PS, Schneider EC. Primary care: a critical review of the evidence on quality and costs of health care. *Health Aff(Millwood)* 2010;29(5):766-72.
- 17 Franks P, Fiscella K. Primary care physicians and specialists as personal physicians. Health care expenditures and mortality experience. *JFamPract* 1998;47(2):105-09.
- 18 Mark DH, Gottlieb MS, Zellner BB, et al. Medicare costs in urban areas and the supply of primary care physicians. *JFamPract* 1996;43(1):33-39.
- 19 van Loenen T, van den Berg MJ, Westert GP, et al. Organizational aspects of primary care related to avoidable hospitalization: a systematic review. *Fam Pract* 2014;31(5):502-16 doi: 10.1093/fampra/cmu053[published Online First: Epub Date].
- 20 Parchman ML, Noel PH, Lee S. Primary care attributes, health care system hassles, and chronic illness. *Med Care* 2005(43):1123-29.
- 21 Forrest CB, Starfield B. The effect of first-contact care with primary care clinicians on ambulatory health care expenditures. *JFamPract* 1996;43(1):40-48.
- 22 Macinko J, Starfield B, Shi L. The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970-1998. *Health ServRes* 2003;38(3):831-65.
- 23 Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q* 2005;83(3):457-502 doi: MILQ409 [pii];10.1111/j.1468-0009.2005.00409.x [doi][published Online First: Epub Date].

- 24 Ashworth M, Armstrong D. The relationship between general practice characteristics and quality of care: a national survey of quality indicators used in the UK Quality and Outcomes Framework, 2004-5. *BMCFamPract* 2006;7:68.:68.
- 25 Sans-Corrales M, Pujol-Ribera E, Gene-Badia J, et al. Family medicine attributes related to satisfaction, health and costs. *FamPract* 2006;23(3):308-16.
- 26 De Maeseneer JM, De Prins L, Gosset C, et al. Provider continuity in family medicine: does it make a difference for total health care costs? *AnnFamMed* 2003;1(3):144-48.
- 27 Doescher MP, Franks P, Saver BG. Is family care associated with reduced health care expenditures? *JFamPract* 1999;48(8):608-14.
- 28 Delnoij D, Van Merode G, Paulus A, et al. Does general practitioner gatekeeping curb health care expenditure? *JHealth ServResPolicy* 2000;5(1):22-26.
- 29 Kroneman M, Paget WJ, Meuwissen LE, et al. An approach to monitoring influenza vaccination uptake across Europe. *EuroSurveill* 2008;13(20):18874.
- 30 Schellevis FG, Westert GP, De Bakker DH. [The actual role of general practice in the dutch health-care system. Results of the second dutch national survey of general practice]. *MedKlin(Munich)* 2005;100(10):656-61.
- 31 Green CJ, Fortin P, Maclure M, et al. Information system support as a critical success factor for chronic disease management: Necessary but not sufficient. *IntJMedInform* 2006;75(12):818-28.
- 32 Kringos DS, Boerma WG, Hutchinson A, et al. The breadth of primary care: a systematic literature review of its core dimensions. *BMC health services research* 2010;10:65.
- 33 Kringos DS, Boerma W, van der Zee J, et al. Europe's strong primary care systems are linked to better population health but also to higher health spending. *Health Aff(Millwood)* 2013;32(4):686-94 doi: 32/4/686 [pii];10.1377/hlthaff.2012.1242 [doi][published Online First: Epub Date].
- 34 Lee A, Kiyu A, Milman HM, et al. Improving health and building human capital through an effective primary care system. *JUrbanHealth* 2007;84(3 Suppl):i75-i85.

- 35 Hansen J, Groenewegen PP, Boerma WG, et al. Living In A Country With A Strong Primary Care System Is Beneficial To People With Chronic Conditions. *Health affairs* 2015; 34(9):1531-7 doi: 10.1377/hlthaff.2015.0582 [published Online First: Epub Date].
- 36 Kroneman MW, Maarse H, van der Zee J. Direct access in primary care and patient satisfaction: a European study. *Health Policy* 2006;76(1):72-79.
- 37 van der Zee J, Kroneman MW. Bismarck or Beveridge: a beauty contest between dinosaurs. *BMCHealth ServRes* 2007;7:94 doi: 1472-6963-7-94 [pii];10.1186/1472-6963-7-94 [doi][published Online First: Epub Date].
- 38 Starfield B. *Comprehensiveness of care: Who should provide what. Primary care: Balancing health needs, services, and technology.* Oxford, New York: Oxford University Press, 1998.
- 39 Masseria C IR, Thomson S, Gemmill M, Mossialos E. *Primary Care in Europe: Policy Brief.* London: LSE, 2009.
- 40 Grielen SJ, Boerma WGW, Groenewegen PP. Unity or diversity? Task profiles of general practitioners in Central and Eastern Europe. *EurJPublic Health* 2000(10):249-54.
- 41 Boerma WG, Van der Zee J, Fleming DM. Service profiles of general practitioners in Europe. *European GP Task Profile Study.* *BrJGenPract* 1997;47(421):481-86.
- 42 Boerma WGW, Fleming DM. *The role of general practice in primary health care.* Norwich: The Stationery Office on behalf of the World Health Organization, 1998.
- 43 Schäfer WLA, Boerma WGW, Spreeuwenberg P, Schellevis FG, Groenewegen PP. Two decades of change in European general practice service profiles: conditions explaining the developments in 28 countries between 1993 and 2012. Submitted 2014.
- 44 Sans-Corrales M, Pujol-Ribera E, Gene-Badia J, et al. Family medicine attributes related to satisfaction, health and costs. *Family practice* 2006;23(3):308-16 doi: 10.1093/fampra/ami112 [published Online First: Epub Date].

- 45 Wilhelmsson S, Lindberg M. Prevention and health promotion and evidence-based fields of nursing - a literature review. *International journal of nursing practice* 2007;13(4):254-65 doi: 10.1111/j.1440-172X.2007.00635.x[published Online First: Epub Date].
- 46 Starfield B. State of the art in research on equity in health. *Journal of health politics, policy and law* 2006;31(1):11-32 doi: 10.1215/03616878-31-1-11[published Online First: Epub Date].
- 47 Grol R, Wensing M, Mainz J, et al. Patients' priorities with respect to general practice care: an international comparison. *European Task Force on Patient Evaluations of General Practice (EUROPEP). FamPract* 1999;16(1):4-11.
- 48 Boerma WG, van der Zee J, Fleming DM. Service profiles of general practitioners in Europe. *European GP Task Profile Study. The British journal of general practice : the journal of the Royal College of General Practitioners* 1997;47(421):481-6.
- 49 Kringos D, Boerma W, Bourgueil Y, et al. The strength of primary care in Europe: an international comparative study. *The British journal of general practice* 2013; 63(616):e742-50 doi: 10.3399/bjgp13X674422[published Online First: Epub Date].
- 50 McKee M; Mackenbach JP. The will and the means to implement health policies. In: Mackenbach JPM, M., ed. *Successes and Failures of Health Policy in Europe: Four decades of divergent trends and converging challenges*. Berkshire: Open University Press, 2013.
- 51 Kingdon J. *Agendas, Alternatives and Public Policies*. Boston, MA: Little Brown, 1984.
- 52 Groenewegen PP, Dixon J, Boerma WGW. The regulatory environment of general practice: an international perspective. In: Saltman RB, Busse R, Mossialos E, eds. *Regulating Entrepreneurial Behaviour in European Health Care Systems*. Buckingham/ Philadelphia: Open University Press, 2002.
- 53 Schäfer WLA, Boerma WGW, Spreeuwenberg P, et al. Two decades of change in European general practice service profiles: conditions associated with the developments in 28 countries between 1993 and 2012. *Scandinavian Journal of Primary health Care* 2016.

- 54 Bosley S, Dale J. Healthcare assistants in general practice: practical and conceptual issues of skill-mix change. *The British journal of general practice : the journal of the Royal College of General Practitioners* 2008;58(547):118-24 doi: 10.3399/bjgp08X277032[published Online First: Epub Date].
- 55 Laurant M, Reeves D, Hermens R, et al. Substitution of doctors by nurses in primary care. *The Cochrane database of systematic reviews* 2005(2):CD001271 doi: 10.1002/14651858.CD001271.pub2[published Online First: Epub Date].
- 56 Boerma WGW. Profiles of General Practice in Europe: An international study of variation in the tasks of general practitioners [PhD thesis], 2003.
- 57 Starfield B. Is patient-centered care the same as person-focused care? *The Permanente journal* 2011;15(2):63-9.
- 58 Schäfer WLA, Boerma WGW, Schellevis FG, et al. GP practices as a one stop shop: how do patients perceive the quality of care? Submitted 2016.
- 59 Kerssens JJ, Groenewegen PP, Sixma HJ, et al. Comparison of patient evaluations of health care quality in relation to WHO measures of achievement in 12 European countries. *BullWorld Health Organ* 2004;82(2):106-14 doi: S0042-96862004000200007 [pii][published Online First: Epub Date].
- 60 Schäfer WLA, Boerma WG, Kringos DS, et al. QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care. *BMCFamPract* 2011;12:115 doi: 1471-2296-12-115 [pii];10.1186/1471-2296-12-115 [doi][published Online First: Epub Date].
- 61 Raudenbush SW; Sampson RJ. Econometrics: toward a science of assessing ecological settings, with application to the systematic social observation of neighborhoods. *Sociological Methodology* 1999;29:1-41.
- 62 Raudenbush S. The quantitative assessment of neighborhood social environments. In: Kawachi I, Berkman LF, eds. *Neighborhoods and Health*: Oxford Press, 2003.

- 63 Kringos DS, Boerma WG, Bourgueil Y, et al. The European primary care monitor: structure, process and outcome indicators. *BMC Fam Pract* 2010;11:81 doi: 1471-2296-11-81 [pii];10.1186/1471-2296-11-81 [doi][published Online First: Epub Date].

Appendices

Appendix 1 Recruitment procedures and response rates

Country	Sampling procedure*	GPs participated	Participation rate	Patients participated	Participation rate
Australia	D	152	5%	1328	74%
Austria	B	184	6%	1784	70%
Belgium	B	408	8%	4084	82%
Bulgaria	B	223	64%	2213	63%
Canada***	B	792	3.4%	5815	79%
Cyprus	A	71	79%	695	68%
Czech Republic	B	219	42%	2200	71%
Denmark	B	212	11%	2087	.
Estonia	A	137	17%	1247	82%
Finland	D	288	29%	1325	79%
Germany	B	238	6%	2351	59%
Greece	D	220	73%	2183	69%
Hungary	D	222	56%	2149	83%
Iceland	A	80	84%	843	87%
Ireland	D	169	7%	1880	73%
Italy	E	218	Not known	2179	70%
Latvia	B	218	40%	2163	82%
Lithuania	B	225	44%	2235	77%
Luxembourg	A	78	65%	792	72%
FYR Macedonia	B	143	60%	1426	87%
Malta	B	70	90%	694	78%
Netherlands	B	238	17%	2234	70%
New Zealand	B	168	12%	1347	.
Norway	E	198	40%	1704	77%
Poland	C	220	33%	2194	54%
Portugal	B	216	27%	2135	88%
Romania	B	220	55%	2195	85%
Slovakia	B	220	22%	2138	65%
Slovenia	B	207	18%	2179	64%

– Appendix 1 to be continued –

Country	Sampling procedure*	GPs participated	Participation rate	Patients participated	Participation rate
Spain	C	428	86%	4162	71%
Sweden	B	97	8%**	885	72%
Switzerland	B	199	10%	1989	78%
Turkey	C	299	23%	2915	76%
UK (England only)	C	171	11%	1451	73%

Notes:

* Sampling procedures codes: A - almost entire FP population; B - random national sample (stratified or not); C - random sample in pre-selected regions; D - mixed procedure (random procedure plus selected FPs); E- opportunity sampling and volunteers

** This is a reflection of the first wave

*** This paper represents a selection of the Canadian database (QUALICOPC database version 4) excluding the final province which participated.

Appendix 2 Overview of the ethics committees in each country

Country	Ethics committee
Australia	The Australian National University (ANU) Human Research Ethics Committee. University of Western Sydney Human Research Ethics Committee. The Royal Australian College of General Practitioners (RACGP) National Research and Evaluation Ethics Committee.
Austria	Ethics committee of the Medical University of Vienna.
Belgium	University Hospital Ghent - Commission for Medical Ethics.
Bulgaria	The coordinator sent an official letter to the Ministry of Health which gave consent and support for the survey. The coordinator confirmed that there is no statutory requirement for ethical approval for this study.
Canada	10 different ethics boards*.
Cyprus	National Bioethical Committee of Cyprus.
Czech Republic	General University Hospital linked to the First Faculty of Medicine, Charles University in Prague.
Denmark	The coordinator confirmed that there is no statutory requirement for ethical approval for this study.
Estonia	The national coordinator consulted with the Ethics Review Committee on Human Research of the University of Tartu. It was confirmed that there is no statutory requirement for ethical approval for this study.
Finland	The ethical committee of Pirkanmaa Hospital District.
Germany	Ethics Commission of the "Landesärztenkammer Hessen".
Greece	Bioethical committees of seventy hospitals.
Hungary	National Ethical Committee.
Iceland	The Icelandic Bioethics Committee. A national committee under the Ministry of Welfare.
Ireland	Irish College of General Practitioners Research Ethics Committee – National Committee.
Italy	At Local Health Authorities level. Approval was requested from LHA Ethical Committees.

– Appendix 2 to be continued –

Country	Ethics committee
Latvia	Latvian Physicians Association Board of Certification.
Lithuania	Kauno Regionus Biomedicininiu Tyrimu Etikos Komitetas.
Luxembourg	National committee of Research Ethic (CNER) in Luxembourg.
FYR Macedonia	Medical Faculty Skopje, R.Macedonia.
Malta	University of Malta Research Ethics Committee.
Netherlands	The ethics committee of VU Medisch Centrum confirmed via an official letter that the research is outside the scope of the WMO (Medical Research Involving Human Subjects Act).
New Zealand	Northern regional committee (Northern Y) for the nationally coordinated Health and Disability Ethics Committees (HDEC).
Norway	The coordinator confirmed that there is no statutory requirement for ethical approval for this study.
Poland	Bioethics approval of Jagiellonian University
Portugal	Ethical committee of Lisbon and Oporto regions; the National Commission for Health Data Safety.
Romania	Scientific Committee of CPSS.
Spain	Research Units of Primary Care of the Autonomous Community in the Basque Country. In all other Autonomous Communities, the study was approved at the Healthcare Area level.
Slovakia	The national coordinator consulted the Council of the Slovak Society of General Practice. It was confirmed that there is no statutory requirement for ethical approval for this study.
Slovenia	National medical ethics committee.
Sweden	Regional Research Ethics Committte.
Switzerland	Ethical Committee of the University of Lausanne.
Turkey	Ethical committee of Kartal Research and Education Hospital in Istanbul.
United Kingdom	University of Lincoln School of Health and Social Care Ethics Committee; National Research Ethics Service.

* See: Wong ST, Chau LW, Hogg W et al. An international cross-sectional survey on the Quality and Costs of Primary Care (QUALICO-PC): recruitment and data collection of places delivering primary care across Canada. *BMC Family Practice* (2015) 16:20.

2

QUALICOPC **A multi-country study** **evaluating quality, costs and equity in primary care**

Schäfer WLA, Boerma WGW, Kringos DS, De Maeseneer J, Greß S, Heinemann S, Rotar-Pavlic D, Seghieri C, Švab I, van den Berg MJ, Vainieri M, Westert GP, Willems S, Groenewegen PP. 2011. Study protocol: QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care, *BMC Family Practice* 2011, 12:115.

Abstract

Background

The QUALICOPC (Quality and Costs of Primary Care in Europe) study aims to evaluate the performance of primary care systems in Europe in terms of quality, equity and costs. The study will provide an answer to the question what strong primary care systems entail and which effects primary care systems have on the performance of health care systems. QUALICOPC is funded by the European Commission under the “Seventh Framework Programme”. In this article the background and design of the QUALICOPC study is described.

Methods/design

QUALICOPC started in 2010 and will run until 2013. Data will be collected in 31 European countries (27 EU countries, Iceland, Norway, Switzerland and Turkey) and in Australia, Israel and New Zealand. This study uses a three level approach of data collection: the system, practice and patient. Surveys will be held among general practitioners (GPs) and their patients, providing evidence at the process and outcome level of primary care. These surveys aim to gain insight in the professional behaviour of GPs and the expectations and actions of their patients. An important aspect of this study is that each patient’s questionnaire can be linked to their own GP’s questionnaire. To gather data at the structure or national level, the study will use existing data sources such as the System of Health Accounts and the Primary Health Care Activity Monitor Europe (PHAMEU) database. Analyses of the data will be performed using multilevel models.

Discussion

By its design, in which different data sources are combined for comprehensive analyses, QUALICOPC will advance the state of the art in primary care research and contribute to the discussion on the merit of strengthening primary care systems and to evidence based health policy development.

Background

Recently, the World Health Organisation (WHO) for the European Region developed 'Health 2020', a new policy oriented vision. It addresses recent challenges to health, such as non-communicable diseases and negative consequences of the ageing of the population, with a specific focus on health inequalities [1]. The EC funded study QUALICOPC (Quality and Costs of Primary Care in Europe) fits well within 'Health 2020', as it aims to evaluate primary care (PC) in Europe in terms of quality, equity and costs of care. The primary level of health care systems has the potential to effectively address the core elements of 'Health 2020', namely social determinants of health and non-communicable diseases. PC can be defined as generalist care being the first level of access to the professional health care system. PC is characterised by its accessibility for the population, irrespective of the nature of health problems, and is provided near patients' homes. Besides providing curative care, PC also offers preventive care and health education. In many European countries, general practitioners (GPs) or family physicians are the main providers of PC. Furthermore, PC includes a variety of providers such as general internists, general paediatricians and gynaecologists. Besides, also dentists, pharmacists, therapists (e.g. physiotherapists and speech therapists), and mental health care workers (e.g. community psychiatrists and psychologists) provide PC [2,3].

Results of the study will inform decision makers about PC systems that have a better quality and cost balance than others and thus enable them to better manage healthcare reforms [4]. Until now, evidence on the benefits of PC is inconclusive and insufficiently takes the diversity and complexity of European health care systems into account [5]. This article explains the background and design of the QUALICOPC project.

A major step in the global attention for PC has been the WHO Declaration of Alma Ata from 1978. The Declaration stressed the importance of creating and sustaining a strong primary (health) care (PHC) system, not just as a part of the health care system, but in particular linked to other sectors as well [6]. The impact of the PHC concept in the industrialised countries has been limited. In Greece PC was reorganized on the basis of these principles [7]. Also, after a

revolution changing the regimes, Spain and Portugal used PC principles to develop PC systems with family physicians [7]. 'Alma Ata' has inspired countries in Europe to develop their own structure of the 'first line' health care services. After the collapse of the Communist regimes in 1991, countries in Central and Eastern Europe were forced to fundamentally restructure their health care systems, including PC [8,9]. Today, strengthening PC is worldwide probably higher on the agenda than ever [10]. It is expected to be an effective response to effects of the current economic crisis on health and health care [11].

The policy strategy towards PC reinforcement is often based on the notion that a strong PC system benefits a nation's health and health care system. PC has the potential to contribute to overall health system performance and health [5].

What is known about benefits of PC?

Previous studies have found better performance among health care systems based on solid PC systems [12-24]. Scientific research, both international comparisons and within the United States, has shown that well developed PC systems have better coordination and continuity of care and better opportunities to control costs [2,12,21,25-27].

A recent review on the relationship between PC and health outcomes and costs reports that in PC oriented countries the population experiences better outcomes and lower costs are incurred [28]. A variety of studies have demonstrated that the supply of primary health care doctors and the ongoing relationships between patients and their GPs are associated with total costs of care. This was true for the adult population as well as among elderly in the USA [29-32].

Furthermore, research from the USA has shown that availability of GPs and Family Physicians and first contact care are associated with reduced unnecessary care (avoidable hospitalisation) and increased accessibility [32-35]. Avoidable hospital admissions can be used as an indicator of health care performance. An admission is avoidable when a relatively expensive hospital admission for a certain condition could have been prevented by effective and/or accessible primary health care. The availability of GPs and insurance coverage for PC are related to lower rates of avoidable hospitalisations [36].

Also, regions with a higher PC doctor density have a healthier population and reduce the negative effects of social inequality [37]. The evidence of a relationship with the structure and strength of PC at national level and equity is however scarce. Equity is usually studied by analysing large national health interview surveys. A study of OECD countries [38] could not substantiate a relationship with PC. Concerning the effects of strong PC on equity results are inconclusive. Until now, no such effects have been clearly demonstrated in international studies [38-40]. However, there are indications that access to care for minority groups is better in well-developed PC systems [41].

A negative effect is that patient satisfaction seems to be lower in health care systems with regulated access to specialist services by gate keeping [42,43].

Several studies, predominantly from the USA, have shown positive effects of PC on health outcomes [5,14]. Health policies aimed at strengthening PC are associated with better levels of health [14]. Strong PC is associated with better health outcomes such as lower rates of all-cause, heart disease, and cancer mortalities [14,44].

In the early 1990's an EU funded project studied the profiles of general practice in Europe. Considerable variation was found in the task profile of PC providers in health care systems in European countries. There were contrasts between regions within Europe and GPs within countries showed large differences in their service profiles [45-48]. The international differences were related to characteristics of the health care systems, such as the GPs' employment status, gate keeping role and mode of remuneration [45,46,49].

In summary, previous studies have found relationships between PC and different health care system outcomes. However, from the European perspective, the currently available evidence on the effects of PC should be considered with care due to the limited generalisability of the results to the European context. These studies have usually included only a selection of EU countries and, additionally, covered non-European OECD countries. Furthermore, so far, little is known about the mechanisms that link aggregate structural elements of health care systems with performance of health care systems. This would demand a deeper insight in professional behaviour of health care workers and the expectations and actions of patients. More in-depth analyses are needed

to substantiate abovementioned findings. Better international comparative data and analyses of good practices will produce information to policy makers and those responsible for provision of services about the drivers of strong PC [50-52].

Objectives

Since the Declaration of Alma Ata, many European countries share the goal of initiating or sustaining a strong PC system as part of their health care system. As a result there is a demand for benchmark information and a growing tendency to learn from foreign experiences. Based on these notions, the QUALICOPC (Quality and Costs of Primary Care in Europe) project has been designed. The project receives co-funding of the European Commission under the "Seventh Framework Programme".

The QUALICOPC project aims to evaluate PC systems in Europe against criteria of quality, equity and costs. QUALICOPC looks at what a strong PC system entails and aims to provide an answer to the question:

What effect does the strength of a primary care system have on the performance of health care systems?

To this end, the organisation of PC at GP practice level and national structures for PC will be related to overall health care system goals, to indicators of the process quality of PC service provision, and to indicators of the quality of PC as perceived by the users of services. The strength of a PC system is determined by the degree of development of a combination of PC functions both at structure level (governance, economic conditions and workforce development) and at process level (access, continuity of care, coordination of care and comprehensiveness of care) in the context of its health care system [5,40,53].

Since 'quality' is a broad concept, its use in the context of PC deserves explanation. Firstly, quality can be related to the structure of care (referring to characteristics such as equipment and human resources), the process of care (the actual delivery of care) or the outcomes (consequences of the process in terms of e.g. health status or patients' evaluations) of it. This division is based on Donabedian's well-known framework.

Secondly, generic and specific dimensions of PC quality should be distinguished [54]. Generic dimensions are those applicable to all health care services; examples are equity, accessibility and user friendliness of

services and effectiveness (both clinical effectiveness and interpersonal effectiveness). Specific dimensions are typically applicable to PC systems:

- continuity of care (longitudinal care; episodic continuity);
- coordination and integration (with other professionals and levels of care);
- scope of services (broad range of curative and preventive services);
- community orientation.

To make the insights of this study tangible, good practices in PC organisation will be identified and disseminated. The insights and lessons produced by the study, in addition to the policy consequences that will be explored, will help decision makers to shape PC systems optimally, given the possibilities, needs and restrictions.

Methods/design

Overall design and hypotheses

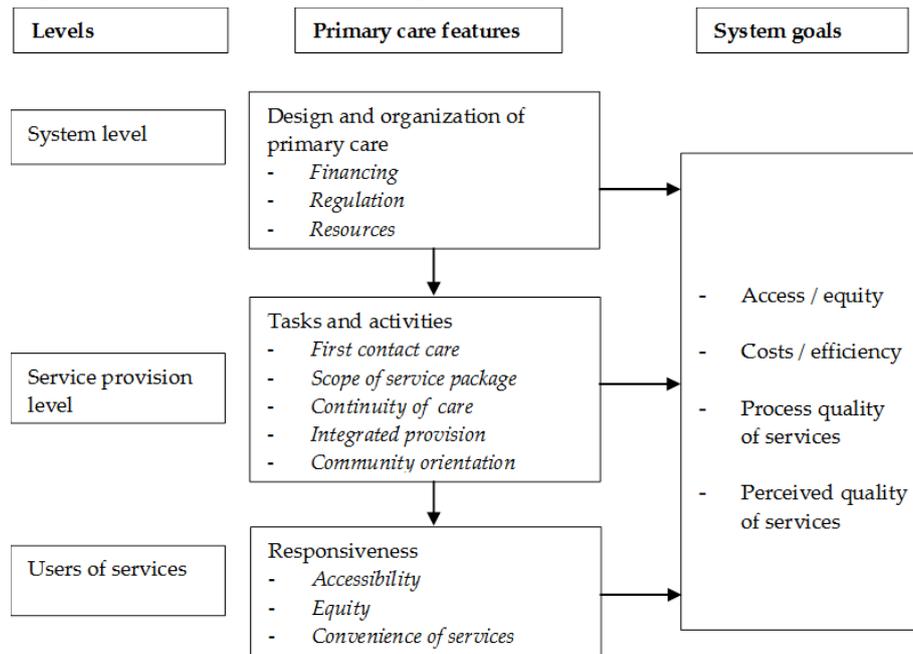
In order to fully understand the underlying mechanisms of PC leading to health system outcomes, this study distinguishes three levels of care. The first level is the system level of PC, encompassing features such as financing, governance and resources. The second level is the provision level, characterised as the delivery of care process at GP practice level. GPs can be seen as the core providers of PC. The third level, are the users of PC services. The features at these three different levels are expected to, directly and indirectly, contribute to health, access/equity, costs, process quality of services and perceived quality of services. The (inter)relations between the different levels and their features and the outcomes are visualised in Figure 1.

A number of hypotheses will be tested in this study, concentrating on different domains: quality of service provision, patients' perceived quality of care, costs, equity, avoidable hospitalisation and good practices. The main hypotheses that will be tested are:

- 1 The degree of organisation of PC practices (e.g. higher skill mix and better organisation of out-of-hours care) is positively associated with the process quality of their services; (system → service provision).

- 2 A strong PC orientation at structure level is positively associated with the degree of organisation of practices and the process quality of services; (system → service provision).
- 3 Process quality of PC services is positively associated with patient evaluations of PC quality; (service provision → perceived quality of services).
- 4 The degree of the organisation of PC practices in combination with quality of the PC process is negatively associated with the incidence of avoidable hospitalisations; (system & service provision → process quality).
- 5 The strength of PC systems (in terms of strong PC orientation at structural level, good organisation of PC practices and high quality of PC services) is negatively associated with total health care expenditures; (system & service provision → costs/efficiency).
- 6 A strong PC orientation at structure level is positively associated with access at the practice level and patient perceived equality in access by socio-economic status; (system & service provision & access → equity).
- 7 The scale of PC organisational units is associated with lower costs and higher quality; (service provision → costs & process quality & perceived quality).
- 8 Process innovation (case and disease management, patient-centered care, integration of prevention) is associated with lower costs and higher quality; (service provision → costs & process quality & perceived quality).
- 9 Delegation and substitution of tasks within PC is associated with lower cost and higher quality. (service provision → costs & process quality & perceived quality).

Figure 1 Elements of the study and their inter-relations



Data collection

Multiple methods of data collection are used in this study. First, the study builds upon existing knowledge, by making use of international studies which have previously invested in collecting evidence on PC at the system (structure) level (see Figure 2).

Secondly, new data are collected, using a cross-sectional survey methodology in a multi-actor design. The multi-actor design makes it possible to directly connect information on PC practices to information provided by patients of these practices. The survey consists of:

- a survey among GPs as core providers of PC collecting data at the process level. The survey also collects information on involvement and relations with other PC providers; part of the survey will be modelled on essential elements of the 1993 study mentioned in Figure 2 [47].

- a survey among patients that were treated at these PC practices to gather data on the process and outcome level; the methodology for this design has been developed and tested in the context of earlier WHO projects (e.g. performed in Turkey and Russia) [55,56].

The survey among patients consists of two questionnaires: one about patients' experiences and one about patients' values. Measuring what patients find important enables the weighing of their experiences [57].

Figure 2 Existing data sources to be used in QUALICOPC

- **Primary Health Care Activity Monitor for Europe (PHAMEU)**; a DG-Sanco funded project, lead by NIVEL, that collected information on the structure of primary care at country level in 2009/10;
- The 1993 EU funded **study on Profile of general practice in Europe**, lead by NIVEL. Elements of this study are part of a primary care evaluation tool, implemented by NIVEL for WHO in countries in transition (e.g. Russian Federation and Turkey);
- **OECD Health Care Quality Indicators (HCQI)** Project has defined a number of quality indicators including indicators for avoidable hospitalisations (Marshall et al., 2006);
- **Eurostat and OECD System of Health Accounts** that aims at harmonizing information on health care costs, both in OECD countries and EU member states
- **OECD Health Equity Project** that analysed a large number of national health interview surveys to estimate equity.

Setting and sampling

Data is collected in 31 European countries (including all 27 EU Member States: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK and two Candidate Member States: Turkey and Iceland and Norway and Switzerland) and in three non-European countries (Australia, Israel and New Zealand). In

each country we aim to realize a response of 220 GPs. In Cyprus, Iceland, Luxembourg and Malta the desired response is lower (around 75). In each country we aim to draw a nationally representative sample of GPs. Initially, this means that a simple random sampling procedure is used, drawing a random sample from the national register of GPs (if available). To avoid the inclusion of multiple GPs which are subject to the same practice variables, only one GP per practice will be included. In countries where a national register is not available a multistage sampling procedure is used e.g. by combining registers from different regions or municipalities. Furthermore, in large countries with differences in health care systems across regions, we selected a number of nationally representative regions and subsequently randomly selected GPs within these regions.

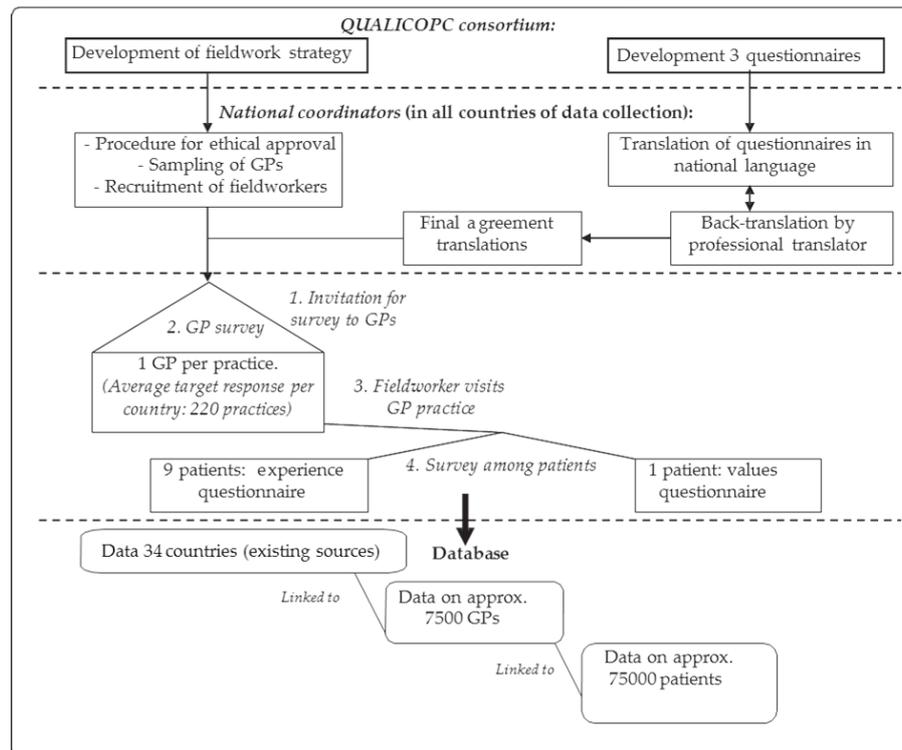
The patient survey will include patients above the age of 18 visiting a GP who filled in the questionnaire. Hence, in this study there is a focus on patients in PC who actually visited the practice. This means that the outcomes of the survey will represent the views of users of PC, rather than the general population. The questionnaires for patients will be distributed through the PC physicians who participate in the GP survey. The 220 physicians will be asked if a fieldworker may visit the practice to distribute questionnaires to patients who have consulted them. In practice, on a set date the fieldworker will visit the practice and ask patients to fill in the questionnaire in the waiting room, until a response of 10 patients has been reached. Per country we aim for a response of 1800 patients for the experiences questionnaire and 220 for the values questionnaire (see section 'Questionnaire development' for explanation on the questionnaires). In Cyprus, Iceland, Luxembourg and Malta the desired response is respectively 720 and 80 patients. In some countries where additional funds are available, a larger response will be realised to make comparison between different regions possible. In each practice the fieldworker will ask the first 9 patients, who are willing to participate, to fill in the experiences questionnaire and the 10th patient to fill in the values questionnaire.

Based upon earlier research it is known that the total numbers per country are sufficient to relate country characteristics, PC practice variables and patient evaluations; moreover numbers are large enough to produce reliable country level estimates of patient evaluations of PC

[58]. Several measures will be taken to acquire sufficient response to the survey. Firstly, per country, a national expert will be commissioned as a national coordinator of the fieldwork. Secondly, the coordinator will be asked to organise acquisition of national support from professional organisations for the study. Thirdly, financial resources will be made available to serve as incentives for GPs. Finally, in each country we will have extra versions of the patients' questionnaires available in the languages of the largest ethnic minority groups.

An overview of the methodologies used in the QUALICOPC study is shown in Figure 3.

Figure 3 Overview of the QUALICOPC study protocol



Questionnaire development

To collect new data required for this study, questionnaires are already developed. The questionnaires need to contribute to the provision of usable data for a variety of topics on PC in Europe. For the GP questionnaire these topics concern activities and tasks of PC providers, process quality of PC and accessibility of PC at the organisational level. The patient questionnaire is aimed at gaining insight into the evaluation of services from the point of view of patients/clients by measuring the perceived quality of care, perceived access to care and actual cost barriers to PC.

To come to well-founded questionnaires several steps were taken. First, a framework, including important aspects regarding the process and outcomes of care, was defined. For the GP questionnaire the framework of Kringos et al (2010) was used. For the patient questionnaire a framework was used based upon the Consumer Quality Index of GP care [59]. Secondly, a search in scientific databases and on the Internet on existing questionnaires on the topics included in the frameworks was performed. Thirdly, the questions from the selected questionnaires were grouped according to the topics of the identified frameworks. Fourthly, gaps were identified by experts on the different research topics (such as equity and costs). It was evaluated for which topics appropriate questions were lacking. For these topics, new questions were formulated. Based upon the findings from the third and fourth step, three questionnaires were developed: one for GPs and two for patients, distinguishing patients' experiences and patients' values. The questionnaires were then piloted in three countries (Belgium, Slovenia and the Netherlands). Based on the findings adjustments were made and consensus on the final questionnaires was reached based on experts' opinions (see section 'pilot'). Specifications on the outcomes of the search strategy, questionnaire development and questionnaires will be published separately.

The survey among GPs includes self-reported involvement in curative and preventive tasks and questions on the type and organisation of the practice, integrated provision of services and aspects of workload and use of time. The patients experience survey contains questions about the patients' backgrounds, distance to the PC practice, choice of doctor, co-payments for services, time for the patients, availability of health

education, experiences with services of the practice or centre, experiences with their own doctor and aspects of care coordination. The patients value questionnaire contains questions about the patients' backgrounds and their values regarding GP care.

As the survey will be held among GPs and patients in 31 European and 3 other countries, the questionnaires will be translated from the English master version into the national languages. Also, to reach the largest groups of ethnic minorities within the countries, some extra versions in languages such as Arabic will be made available for patients. An independent 'forth and back translation' procedure will be used.

Pilot

A pilot was held to test the process of completing the survey in the GP practice and to test the relevance and comprehensibility of both questionnaires. Questions regarding the process that were addressed are e.g.: How long does it take to fill in the questionnaires? Are GPs and patients easily willing to participate? By testing comprehensibility of the questionnaires we tried to answer questions like: Are the instructions on the questionnaire understood by all respondents? For the closed questions, are all reasonable alternatives included for the respondents? The pilot was held in three countries in Europe (Belgium, the Netherlands and Slovenia) among a small sample of GPs and patients. GPs and patients were surveyed in the GP practice setting.

Data handling

All questionnaire data will be centrally processed in the Netherlands. The questionnaires will have a uniform design and a closed answering format to allow optical reading technology for data entry. The data will be analysed initially to construct new variables to be used in the analyses for the hypotheses. This guarantees unity in the way important variables, such as process quality of PC and patient evaluations of PC quality, are defined.

Data analysis

The data collected in this study will be integrated by using statistical models for hierarchically structured data in multilevel models [60,61].

Multilevel models enable to partition the variation in (e.g.) patient perceived quality of care into three parts:

- a part related to the individual patients (related to personal background, health status etc.);
- a part related to the PC practices they visit (e.g. related to the range of services that these practices provide and the process quality of the practices);
- a part related to the health care system of the countries (e.g. related to structural aspects of PC and the strength of PC).

Apart from studying general patterns and trends we will identify good practices which in a statistical sense are the outliers in the statistical analysis. Analyses will be made on the combinations of traits and circumstances that explain their position.

Data analysis techniques will include: data reduction by scale construction using factor analysis, reliability analysis and econometrics; single level regression and correlation to analyse the relations at country level between PC structure and quality, cost and equity variables; multilevel analysis to relate country, practice and patient levels.

The use of multilevel statistical analysis (MLA) is essential in this study, in particular where survey data (from GPs and patients) are integrated with aggregate data at health care system level. The MLA approach has specifically been developed for these situations, where units on which variables are measured are nested within larger (higher level) units; such as patients within GP practices, or GPs within a country's health care system. MLA allows analysing variables at the country level and at the GP (practice) level at the same time.

Personal data confidentiality

For the survey among GPs random samples will be drawn of GPs from available lists or registers. Patients will be approached in the practices. Procedures which apply for this use of registers in each country and for survey research among patients will be identified and carefully observed. When necessary, we will apply for ethical approval in the participating countries. The survey is anonymous; respondents (physicians and patients) do not need to fill in their name. To be able to link the data of GPs to the countries and their patients, we will use

identification numbers. In no publication results will be reported that can be related in any way to individuals or locations.

Investigators

The research team consists of experienced researchers, with backgrounds in health services research, economic analysis, patient evaluation surveys, survey design, statistical modelling and PC research. The team has extensive experience in research on international comparisons of health care systems. Each of the involved research institutes are leading on one of the main study topics (equity, costs or efficiency, process quality of services, perceived quality of services) which fits within their expertise.

Discussion

The evidence on the effects of strong PC systems is inconclusive. Reforms favouring PC systems are based on the plausibility of effects rather than on its base of evidence. The available evidence is from studies with a limited focus, and not representing the diverse situations of health care in the countries of Europe. The QUALICOPC project will considerably contribute to this base of evidence and thus advance the state of the art of (primary) health services research.

The outcomes of the QUALICOPC project will be used to inform the European Union and other international organisations, such as the WHO, but particularly also national governments. The deeper insights, provided by this project, in specific elements of PC organisation and provision which have a positive effect on performance of health systems in general, will contribute to more effective health policy.

QUALICOPC uses an ambitious methodology integrating different levels of care by the use of existing databases and surveys among GPs and their patients. Using elements from the 1993 Task Profile study will not just provide information on changes that have occurred since then, the innovative element is adding the patient's perspective, thus increasing the chances of meaningful interpretations.

QUALICOPC will use a survey methodology in a multi-actor design, allowing to connect the information on PC practices with information provided by patients from these practices and system level information. The use of these state-of-art methods is expected to serve as a 'model of good practice' for future health services studies.

QUALICOPC Worldwide

Based on the network of the QUALICOPC consortium, several research institutes from countries with a PC system comparable to European countries were invited to participate in the QUALICOPC study. Three non-European countries have raised funding and will participate in this study: Australia, Israel and New Zealand. For the study it will improve the evidence base for the mechanisms of PC systems and their effect on health care system performance measures. In addition, a broader international participation will provide the study a deeper insight in the national strategies of PC systems, professional behaviour of health care workers and the expectations and actions of patients around the world.

Conclusion

Demographical changes, technological developments and rising expectations bring about many challenges for European health systems in the coming decades [62]. In Europe, countries are looking for solutions to create more coherence and coordination in care to address the problem of a lack in responsiveness to the needs of populations. PC is seen as the part of the health care system where this problem can be tackled to a large extent [10].

The variety of models of organisation and provision of health care services found in Europe, are favourable circumstances to undertake sound and comprehensive studies on the merits of PC for health care systems in general. The rich diversity of the structure and financing of European health systems, makes this setting a laboratory for comparative research and a pool of good practices [63]. The QUALICOPC study benefits of this situation by thorough analysis of PC at three levels in 31 European countries. The impact of QUALICOPC is boosted as a result of its strategy to combine previous work (which itself

had already a good impact) with new elements, one of which being the measurement of the way PC affects equity in health care. With the applied study design, this project will be able to answer the question: *What effect does the strength of a primary care system have on the performance of health care systems?*

References

- 1 World Health Organisation: Developing the new European policy for health - Health 2020./07 110419. World Health Organisation; 2011.
- 2 Health Council of the Netherlands: European Primary care. The Hague, Health Council of the Netherlands 2004.
- 3 Boerma WGW, Dubois CA: Mapping primary care accross Europe. In Primary care in the driver's seat? Organizational reform in European primary care. Edited by: Saltman RB, Rico A, Boerma WGW. Bershire: Open University Press; 2006:22-49.
- 4 European Commission: FP 7 Cooperation Work Programme: Health. European Comission C(2008)4598 of 29 August 2008). 2009.
- 5 Kringos DS, Boerma WG, Hutchinson A, van der Zee J, Groenewegen PP: The breadth of primary care: a systematic literature review of its core dimensions. BMC Health Serv Res 2010, 10:65.
- 6 World Health Org: Declaration of Alma Ata: International conference on Primary Health Care, Alma-Ata, USSR. 2006.
- 7 Campbell JL, Medive J, Timmermans A: Primary care and general practice in Europe: West and South. In Oxford Textbook of Primary Medical Care. Edited by: Jones R, Britten N, Culpepper L, Gass D, Grol R, Mant D et al. Oxford: Oxford University Press; 2005:65-70.
- 8 Windak A, Van Hasselt P: Primary care and general practice in Europe: Central and East. In Oxford Textbook of Primary Medical Care. Edited by: Jones R, Britten N, Culpepper L, Gass D, Grol R, Mant D et al. Oxford: Oxford University Press; 2005:70-73.
- 9 Marrée J, Groenewegen PP: Back to Bismarck: Eastern European Health Care Systems in Transition Aldershot: Avebury; 1997.
- 10 World Health Org: The World Health Report 2008: Primary Health Care - Now More Than Ever. Geneva, World Health Organisation; 2008.
- 11 World Health Org: The Financial Crisis and Global Health: Report of a High-Level Consultation, 19 January 2009. Geneva, World Health Organization; 2009.
- 12 Macinko J, Starfield B, Shi L: The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970-1998. Health Serv Res 2003, 38:831-865.

- 13 Starfield B: Primary care and health. A cross-national comparison. *JAMA* 1991, 266:2268-2271.
- 14 Starfield B, Shi L, Macinko J: Contribution of primary care to health systems and health. *Milbank Q* 2005, 83:457-502.
- 15 Ashworth M, Armstrong D: The relationship between general practice characteristics and quality of care: a national survey of quality indicators used in the UK Quality and Outcomes Framework, 2004-5. *BMC Fam Pract* 2006, 7:68.
- 16 Kerssens JJ, Groenewegen PP, Sixma HJ, Boerma WG, van der Eijk I: Comparison of patient evaluations of health care quality in relation to WHO measures of achievement in 12 European countries. *Bull World Health Organ* 2004, 82:106-114.
- 17 Nolte E, Bain C, McKee M: Diabetes as a tracer condition in international benchmarking of health systems. *Diabetes Care* 2006, 29:1007-1011.
- 18 Sans-Corrales M, Pujol-Ribera E, Gene-Badia J, Pasarin-Rua MI, Iglesias- Perez B, Casajuana-Brunet J: Family medicine attributes related to satisfaction, health and costs. *Fam Pract* 2006, 23:308-316.
- 19 De Maeseneer JM, De Prins L, Gosset C, Heyerick J: Provider continuity in family medicine: does it make a difference for total health care costs? *Ann Fam Med* 2003, 1:144-148.
- 20 Doescher MP, Franks P, Saver BG: Is family care associated with reduced health care expenditures? *J Fam Pract* 1999, 48:608-614.
- 21 Delnoij D, Van Merode G, Paulus A, Groenewegen P: Does general practitioner gatekeeping curb health care expenditure? *J Health Serv Res Policy* 2000, 5:22-26.
- 22 Kroneman M, Paget WJ, Meuwissen LE, Joseph C, Kennedy H: An approach to monitoring influenza vaccination uptake across Europe. *Euro Surveill* 2008, 13:18874.
- 23 Schellevis FG, Westert GP, De Bakker DH: [The actual role of general practice in the dutch health-care system. Results of the second dutch national survey of general practice]. *Med Klin (Munich)* 2005, 100:656-661.
- 24 Green CJ, Fortin P, Maclure M, Macgregor A, Robinson S: Information system support as a critical success factor for chronic disease management: Necessary but not sufficient. *Int J Med Inform* 2006, 75:818-828.

- 25 Shi L, Starfield B, Politzer R, Regan J: Primary care, self-rated health, and reductions in social disparities in health. *Health Serv Res* 2002, 37:529-550.
- 26 Shi L, Macinko J, Starfield B, Politzer R, Wulu J, Xu J: Primary care, social inequalities and all-cause, heart disease and cancer mortality in US counties: a comparison between urban and non-urban areas. *Public Health* 2005, 119:699-710.
- 27 Starfield B: Is primary care essential? *Lancet* 1994, 344:1129-1133.
- 28 Friedberg MW, Hussey PS, Schneider EC: Primary care: a critical review of the evidence on quality and costs of health care. *Health Aff (Millwood)* 2010, 29:766-772.
- 29 Weiss LJ, Blustein J: Faithful patients: the effect of long-term physician- patient relationships on the costs and use of health care by older Americans. *Am J Public Health* 1996, 86:1742-1747.
- 30 Franks P, Fiscella K: Primary care physicians and specialists as personal physicians. Health care expenditures and mortality experience. *J Fam Pract* 1998, 47:105-109.
- 31 Welch WP, Miller ME, Welch HG, Fisher ES, Wennberg JE: Geographic variation in expenditures for physicians' services in the United States. *N Engl J Med* 1993, 328:621-627.
- 32 Mark DH, Gottlieb MS, Zellner BB, Chetty VK, Midtling JE: Medicare costs in urban areas and the supply of primary care physicians. *J Fam Pract* 1996, 43:33-39.
- 33 Parchman ML, Culler S: Primary care physicians and avoidable hospitalizations. *J Fam Pract* 1994, 39:123-128.
- 34 Parchman ML, Noel PH, Lee S: Primary care attributes, health care system hassles, and chronic illness. *Med Care* 2005, 1123-1129.
- 35 Forrest CB, Starfield B: The effect of first-contact care with primary care clinicians on ambulatory health care expenditures. *J Fam Pract* 1996, 43:40-48.
- 36 Weissman JS, Gatsonis C, Epstein AM: Rates of avoidable hospitalization by insurance status in Massachusetts and Maryland. *JAMA* 1992, 268:2388-2394.
- 37 Starfield B, Shi L, Grover A, Macinko J: The effects of specialist supply on populations' health: assessing the evidence. *Health Aff (Millwood)* 2005, , Suppl Web Exclusives: W5-97-W5-107, W5.

- 38 van Doorslaer E, Masseria C, Koolman X: Inequalities in access to medical care by income in developed countries. *CMAJ* 2006, 174:177-183.
- 39 Starfield B: State of the art in research on equity in health. *J Health Polit Policy Law* 2006, 31:11-32.
- 40 Ros CC, Groenewegen PP, Delnoij DM: All rights reserved, or can we just copy? Cost sharing arrangements and characteristics of health care systems. *Health Policy* 2000, 52:1-13.
- 41 Uiters E, Deville W, Foets M, Spreeuwenberg P, Groenewegen PP: Differences between immigrant and non-immigrant groups in the use of primary medical care; a systematic review. *BMC Health Serv Res* 2009,9:76.
- 42 Kroneman MW, Maarse H, van der Zee J: Direct access in primary care and patient satisfaction: a European study. *Health Policy* 2006, 76:72-79.
- 43 van der Zee J, Kroneman MW: Bismarck or Beveridge: a beauty contest between dinosaurs. *BMC Health Serv Res* 2007, 7:94.
- 44 Lee A, Kiyu A, Milman HM, Jimenez J: Improving health and building human capital through an effective primary care system. *J Urban Health* 2007, 84:i75-i85.
- 45 Boerma WG, van der Zee J, Fleming DM: Service profiles of general practitioners in Europe. *European GP Task Profile Study*. *Br J Gen Pract* 1997, 47:481-486.
- 46 Boerma WG, Groenewegen PP, van der Zee J: General practice in urban and rural Europe: the range of curative services. *Soc Sci Med* 1998, 47:445-453.
- 47 Boerma WG: Profiles of general practices in Europe. An international study of variation in the tasks of general practitioners Utrecht: NIVEL; 2003.
- 48 Svab I, Pavlic DR, Radic S, Vainiomaki P: General practice east of Eden: an overview of general practice in Eastern Europe. *Croat Med J* 2004, 45:537-542.
- 49 Boerma WG, Verhaak PF: The general practitioner as the first contacted health professional by patients with psychosocial problems: a European study. *Psychol Med* 1999, 29:689-696.
- 50 Starfield B, Shi L: Policy relevant determinants of health: an international perspective. *Health Policy* 2002, 60:201-218.

- 51 De Maeseneer JM, van Driel ML, Green LA, van Weel C: The need for research in primary care. *Lancet* 2003, 362:1314-1319.
- 52 Rosser WW, van Weel C: Research in family/general practice is essential for improving health globally. *Ann Fam Med* 2004, 2(Suppl 2):S2-S4.
- 53 van der Zee J, Boerma WGW, Kroneman MW: Health care systems: understanding the stages of development. In *Oxford Textbook of Primary Medical Care*. Edited by: Jones R, Britten N, Culpepper L, Gass D, Grol R, Mant D et al. Oxford: Oxford University Press; 2004:51-54.
- 54 Campbell SM, Roland MO, Buetow SA: Defining quality of care. *Soc Sci Med* 2000, 51:1611-1625.
- 55 Kringos DS, Boerma WGW, Spaan EJAM: Evaluation of primary care in the Russian Federation and Turkey. Results of two pilot applications of the Primary Care Evaluation Tool. Copenhagen, WHO Regional Office; 2008.
- 56 Kringos DS, Boerma WG, Spaan E, Pellny M: A snapshot of the organization and provision of primary care in Turkey. *BMC Health Serv Res* 2011, 11:90.
- 57 Delnoij DM, Rademakers JJ, Groenewegen PP: The Dutch consumer quality index: an example of stakeholder involvement in indicator development. *BMC Health Serv Res* 2010, 10:88.
- 58 Paterson L, Goldstein H: *New Statistical Methods for Analysing Social Structures: An Introduction to Multilevel Models*. *British Educational Research Journal* 1991, 17:387-393.
- 59 Meuwissen LE, De Bakker DH: CQ-index huisartsenzorg: meetinstrumentontwikkeling. *Kwaliteit van de zorg in de huisartsenpraktijk vanuit het perspectief van patiënten: de ontwikkeling van het instrument, de psychometrische eigenschappen en het discriminerend vermogen*. Utrecht, NIVEL; 2008.
- 60 Leyland AH, Groenewegen PP: Multilevel modelling and public health policy. *Scand J Public Health* 2003, 31:267-274.
- 61 Snijders T, Bosker R: *Multilevel analysis: an introduction to basic and advanced multilevel modelling* London: Sage; 1999.
- 62 HSR-Europe: Policy Brief 'Health services research: helping tackle Europe's health care challenges'. Utrecht, NIVEL; 2011.

63 Groenewegen PP, Dixon J, Boerma WGW: The regulatory environment of general practice: an international perspective. In *Regulating entrepreneurial behaviour in European health care systems*. Edited by: Saltman RB, Busse R, Mossialos E. Open University Press; 2002:200-214.

3

Measures of quality, costs and equity in primary care

**Instruments developed to analyse and compare primary care
in 34 countries**

WLA Schäfer, WGW Boerma, DS Kringos et al, 2013. Measures of quality, costs, and equity in primary care instruments, *Quality in Primary Care* 2013; 21:67-79.

Abstract

Background

The Quality and Costs of Primary Care in Europe (QUALICOPC) study aims to analyse and compare how primary care systems in 35 countries perform in terms of quality, costs and equity. This article answers the question 'How can the organisation and delivery of primary care and its outcomes be measured through surveys of general practitioners (GPs) and patients?' It will also deal with the process of pooling questions and the subsequent development and application of exclusion criteria to arrive at a set of appropriate questions for a broad international comparative study.

Methods

The development of the questionnaires consisted of four phases: a search for existing validated questionnaires, the classification and selection of relevant questions, shortening of the questionnaires in three consensus rounds and the pilot survey. Consensus was reached on the basis of exclusion criteria (e.g. the applicability for international comparison). Based on the pilot survey, comprehensibility increased and the number of questions was further restricted, as the questionnaires were too long.

Results

Four questionnaires were developed: one for GPs, one for patients about their experiences with their GP, another for patients about what they consider important, and a practice questionnaire. The GP questionnaire mainly focused on the structural aspects (e.g. economic conditions) and care processes (e.g. comprehensiveness of services of primary care). The patient experiences questionnaire focused on the care processes and outcomes (e.g. how do patients experience access to care?). The questionnaire about what patients consider important was complementary to the experiences questionnaire, as it enabled weighing the answers from the latter. Finally, the practice questionnaire included questions on practice characteristics.

Discussion

The QUALICOPC researchers have developed four questionnaires to characterise the organisation and delivery of primary care and to compare and analyse the outcomes.

Data collected with these instruments will allow us not only to show in detail the variation in process and outcomes of primary care, but also to explain the differences from features of the (primary) care system.

How this fits in with quality in primary care

What do we know?

Many studies using questionnaires for general practitioners (GPs) and patients have answered questions on specific subjects or themes in primary care. The development of measuring instruments for the Quality and Costs of Primary Care in Europe (QUALICOPC) study has made use of questionnaires from those studies.

What does this paper add?

A major challenge in health services research is to show what configurations of primary care are associated with better outcomes, in terms of quality, equity and costs. This requires data collection on essential features of the organisation and delivery of services in general practice in many countries. In the QUALICOPC study, the following features are measured by means of surveys among GPs and their patients: efficiency of care; workforce development; economic conditions; coordination and cooperation; continuity, quality and comprehensiveness of care; avoidable hospitalisation; involvement of GPs in disease management programmes; equity in access and treatment; and patient involvement in the decision-making process. Measures of experience of patients with aspects of care are weighed against the importance that they attach to those aspects.

Background

Many European countries share the goal of initiating or sustaining strong primary care systems. As a result, there is a demand for benchmarking information and a growing tendency to learn from foreign experiences. Evidence on the outcomes of primary care in European countries is, however, still incomplete [1]. Variation in the organisation of primary care in Europe enables analyses of the relationship between primary care organisation and outcomes. Decision makers may benefit from information about arrangements of primary care which are more likely to produce better outcomes [2]. In 2010, the three-year Quality and Costs of Primary Care in Europe (QUALICOPC) study started. This study aims to compare and analyse how the primary care systems of 35 countries perform in terms of quality, costs and equity. The results of this study will contribute to evidence on the benefits of strong primary care and on the performance of care systems in general. The European countries include 27 EU countries, Iceland, Norway, Turkey, Switzerland and Macedonia. Outside Europe, Australia, Canada and New Zealand have joined the study. For this study, data will be gathered by means of surveys among general practitioners (GPs) and their patients [1]. National characteristics of the organisation of primary care will be derived from other sources, such as the Primary Health Care Activity Monitor (PHAMEU) database [3]. GPs were chosen as survey subjects, because they can be seen as the main providers of primary care. However, the project aims to provide insight into not only GP care, but also primary care as a whole. Fieldworkers, who will visit GP practices to recruit patients and assist them, if necessary, with filling in the questionnaire, will also fill in a practice questionnaire. The data from GPs, patients and fieldworkers will be linked to each other. For more information on the QUALICOPC study, see Box 1 [1].

Box 1 The QUALICOPC study

The QUALICOPC study is co-funded by the European Commission under the so-called 'Seventh Framework Programme', and is carried out by a consortium of six research institutes from Belgium, Germany, Italy, the Netherlands and Slovenia. The study is coordinated by NIVEL, the Netherlands Institute for Health Services Research. Data are being collected in 32 European countries (27 EU countries, Iceland, Norway, Turkey, Switzerland and Macedonia). Furthermore, research units from Australia, Canada and New Zealand have joined the study. Data collection focuses on three levels: the health care system, the GP practice and patients. Data on the health care system are derived from existing sources (e.g. the Primary Health Care Activity Monitor database). New information is being collected through surveys among GPs (seen as the main providers of primary care) their patients and fieldworkers visiting GP practices. Answers to the questionnaires provide insight into the professional behaviour of GPs and the experiences of patients. Furthermore, for comparison, data from a 1993 European study on the task profiles of GPs are available. In each country, the response target is 220 GPs and 2200 patients. The questionnaires will be translated in the national languages of the included countries via an official forward- and back-translation procedure and in some languages of large ethnic minority groups [1]. More details of the study design and the background of the QUALICOPC project have been published by Schäfer et al [1].

Primary care can be characterised as the first level of access to care and is provided near patients' homes. Primary care includes curative and rehabilitative care, preventive care and health education [4,5]. A recent literature review on primary care [6] distinguishes three levels of care, namely the structure, process and outcome of care. Within these levels, 10 core dimensions to measure primary care were identified (see Table 1).

Table 1 Phases in the development of the questionnaires

Structure

1. Governance of the PC system
2. Economic conditions of the PC system
3. PC workforce development

Process

4. Access to PC services
5. Continuity of PC
6. Coordination of PC
7. Comprehensiveness of PC services

Outcome

8. Quality of PC
9. Efficiency of PC
10. Equity in health

The QUALICOPC study aims to comprehensively evaluate the breadth of primary care by gathering data on all these dimensions. The analyses will focus on the following overarching themes: quality of the process of care (including the dimensions of access, continuity, coordination and comprehensiveness of primary care services), experiences of patients (as an indicator of the dimension quality of primary care), costs of primary care (as a part of the dimension efficiency of care), equity (related to the dimension access and the quality of primary care), avoidable hospitalisation (as an indicator of the dimension quality of primary care). A sixth synthesising theme will be the identification of 'good practices' of primary care provision (related to all dimensions to measure primary care) [1].

To collect data related to these six themes, new questionnaires had to be developed. Many previous studies have used questionnaires for primary care physicians and patients. In the past, comprehensive primary care studies have been performed, for example by Barbara Starfield [7] and the Commonwealth Fund [8], but only a limited number of European countries were included. Furthermore, many studies that have used questionnaires from GPs and patients had a focus on specific subjects or themes rather than a multidimensional approach. This study aims to

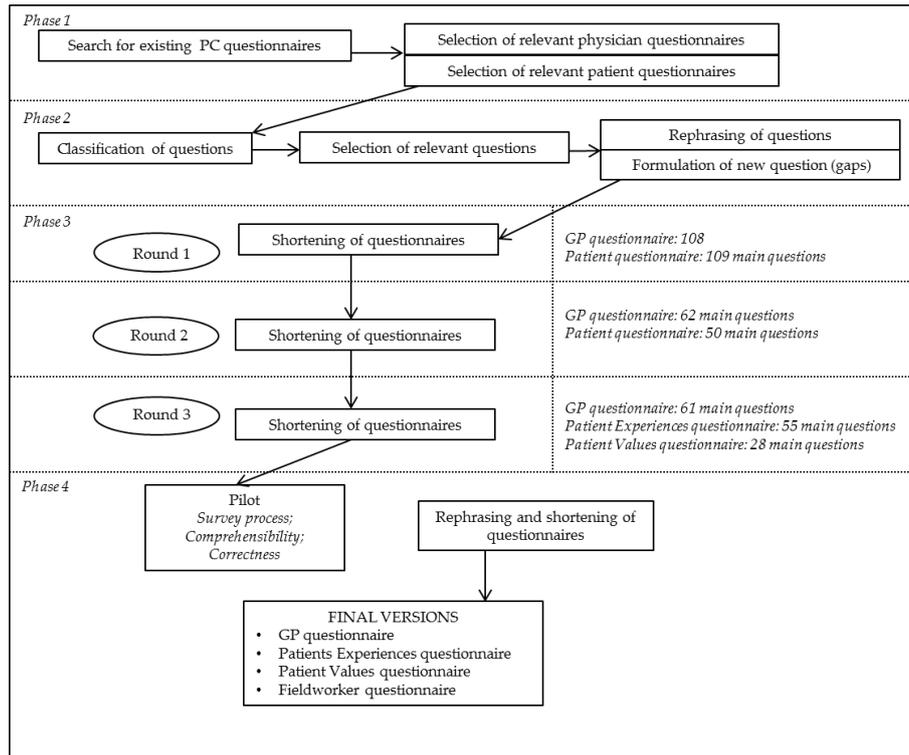
unravel the processes and contributions of primary care to its outcomes in terms of quality, costs and equity.

The questions in the questionnaire should not only cover all themes but also be suitable for use in international surveys, which means that differences in the health care context between countries need to be taken into account. This article describes the background to and development of the questionnaires for the QUALICOPC study. It addresses the question 'How can the quality, costs and equity of a primary care system be measured?' Furthermore, criteria used for inclusion or exclusion of questions are presented, as well as an overview of the resulting questions that can be used for international comparative research on primary care.

Methods

Four questionnaires were developed: one for GPs, one for patients about their experiences with their GP, another for patients about their values regarding primary care (i.e. what they consider important), and finally one about the practice. Because the project aims to provide insight into GP care as a whole, the GP questionnaire should also include questions beyond the scope of the tasks of the GP. The questionnaire about what patients find important is added to weigh against their experiences. Development of the questionnaires consisted of four phases: a search for existing questionnaires, the classification and selection of relevant questions (including formulation of inclusion and exclusion criteria), shortening of the questionnaires and the pilot survey. An overview of the development process is presented in Figure 1.

Figure 1 Phases in the development of the questionnaires



Phase 1: bibliometric search

In the first phase, existing questionnaires, published between 1990 and 2010 and with an abstract written in English, were searched for in the bibliographic databases PubMed and Embase. The search aimed to identify validated questionnaires for primary care physicians and patients, suitable for international comparisons. Search terms were derived from the 10 dimensions for measuring primary care (Table 1). In addition, attention was paid to identifying questionnaires on avoidable hospitalisation, which is not explicitly covered in the dimensions, and on equity, which has received relatively little attention in international comparative primary care research [2,6].

Phase 2: classification, selection, rephrasing and new questions

In the second phase, questions from the included questionnaires were classified according to the 10 dimensions. Next, the researchers selected questions that contribute to answering the main research questions of the QUALICOPC study. Questions were rephrased to fit the study approach and aim. Furthermore, new questions were formulated for gaps that were identified. The identified questions were divided between the provisional list of questions for the GP questionnaire and the Patient Experiences and Patient Values questionnaires.

Phase 3: consensus rounds

Next, in three consensus rounds, the researchers evaluated the questionnaires and selected the questions for inclusion. Each of the questions was discussed for its relevance to the purpose of this study and the exclusion criteria in order to further increase the suitability of the questions for the surveys. The researchers developed the following set of criteria for inclusion/exclusion:

- the question is not suitable for international comparison (e.g. not applicable in several countries);
- the question refers to a characteristic of the health;
- care system (that can be found elsewhere, e.g. the PHAMEU database) rather than to a characteristic of an individual practice or experience of a patient;
- very little variation in the answers is expected, both
- within and between countries;
- the question is very detailed and will provide only fractional information;
- answers to the questions are expected to be unreliable (e.g. due to social desirability bias);
- the question is likely to be too difficult for the respondent (e.g. it demands a high level of literacy).

In three rounds, the researchers submitted the questions to these criteria, until consensus was found. At this stage, questions were reformulated where necessary to increase comprehensibility.

Pilot survey

As a final step, a pilot survey was held with GPs and patients in Belgium, the Netherlands and Slovenia, aiming to test the practicality and applicability of the survey and the comprehensibility and appropriateness of the questions. In each country, a convenience sample of GPs (around 10) was invited to participate. GPs were asked to fill in the questionnaire, which contained an extra column to add comments and questions to the questionnaire. Furthermore, project researchers visited the general practices to recruit a random sample of patients. In each practice, four consecutive patients who agreed to fill in the questionnaire were included. This resulted in a total of 112 completed questionnaires from patients (40 in Belgium and Slovenia and 32 in the Netherlands). During the visits, researchers filled in a checklist, took notes of the proceedings and asked the patients to directly mention problems or questions which they did not understand. Based on the findings of the pilot a final consensus round was held in which the questionnaires were further shortened and questions which were found too difficult were rephrased.

During the pilot and the subsequent final consensus round, special attention was paid to the intelligibility of questions, because the changed wording of several questions could have affected their validity. Explicit cognitive testing, however, has not been part of the pilot study. For two reasons it was decided not to assess the psychometric properties of the draft questionnaires. First, questions dealing with factual circumstances or facilities are less suitable for such testing. Besides, questions copied from validated questionnaires have been tested already.

For instance, the questions on services that GPs offer to their patients that are derived from the European GP Task Profile study have been tested for internal consistency and scale reliability [9].

Results

In this section, the results of each of the phases of the development are discussed. Next, the final outcomes, namely the questionnaires, are presented.

Phase 1: bibliometric search

Through the bibliometric search, 2783 potentially relevant studies for the GP questionnaire were identified. After careful screening, 13 relevant primary care physician questionnaires were identified, an overview of which is presented in Box 2. For the patient questionnaire, 2213 potentially relevant sources were found, which eventually resulted in 64 relevant questionnaires (see Box 3).

Box 2 Retrieved GP questionnaires from phase 1

- The WHO Global Health Professional Survey [43]
- Primary Care Evaluation Tool [25,27]
- Primary Care Assessment Tool (provider and facility versions, expanded and short version) [13]
- National survey of GPs' views on continuity of care [26]
- Task profiles of GPs in Europe [10]
- Survey about patient care in departments of general practice [44]
- Eurocommunication GP questionnaire [45]
- International Health Policy survey of primary care physicians [8]
- Attitudes to family practice registration programmes questionnaire [46]
- GP snapshot survey [28]
- National survey of physicians on practice experience [12]
- National Ambulatory Medical Care Survey [29]
- The European Practice Assessment (EPA) instrument [24]

Box 3 Retrieved patient questionnaires from phase 1

- Patient Assessment of Communication during Telemedicine (PACT) questionnaire [33]
- European Health Interview Survey [30]
- Patient Expectations Questionnaire (PEQ) [36]
- Propensity to Seek Health Care Questionnaire [40]
- Expectancies list from Nijmegen [41]
- Consumer Quality Index GP care [14]
- CAHPS Adult Primary Care Questionnaire 1.0: Clinician and Group Survey [34]

– Box 3 to be continued –

- Nurse Practitioner Satisfaction Survey (NPSS) [47]
- Physician–Patient Questionnaire (PPQ) [48]
- Patient Participation Program Survey [49]
- A modified version of the General Practitioner Assessment Survey (GPAS) [50]
- Survey of primary care patients’ preferences and their experiences with interpersonal continuity of care [51]
- Patient Satisfaction Survey with Primary Care Office-Based Buprenorphine/Naloxone Treatment Survey [52]
- Consumer Quality Index Continuum of Care [53]
- CAHPS American Indian Survey [54]
- Duke Health Profile (the DUKE) [55]
- Victorian Population Health Survey [56]
- Patient Satisfaction with Primary Care Survey [57]
- EuroQol EQ-5D Health Questionnaire [58]
- HTPN Patient Satisfaction Survey [59]
- Patient Satisfaction Consultation Questionnaire (PSCQ-7) [60]
- Health Care Satisfaction Questionnaire (HCSQ) [61]
- Patient Experiences Questionnaire for Out-of-Hours Care (PEQ-OHC) [62]
- The ‘5As’ model (assess, advise, agree, assist, arrange) [63]
- Breast cancer patient satisfaction with follow-up in primary care versus specialist care survey [64]
- Patient Continuity of Care Questionnaire (PCCQ) [65]
- Assessment of Quality of Life (AQoL) instrument [66]
- The patient enablement instrument [37]
- Consumer Satisfaction with Public Health Care Survey [67]
- Patient satisfaction survey amongst family practice patients with diverse ethnic backgrounds [68]
- Medical Interview Satisfaction Scale (MISS) [69]
- Primary Care Evaluation Tool (PCET) [27]
- Patient satisfaction with visits to family physician [32]
- Consumer satisfaction with primary care provider choice and associated trust [70]
- Patient satisfaction survey of primary health care (PHC) services among elderly people (2:60 years) [71]

– Box 3 to be continued –

- Quality of Visit to Family Physician Questionnaire [72]
- Client Perceptions of Coordination Questionnaire (CPCQ) [38]
- Out-of-Hours Patient Questionnaire [73]
- General Practice Assessment Questionnaire (GPAQ) [35]
- National Survey of NHS Patients: General Practice [39]
- GP Patient Survey [74]
- Survey of patients' views of access to electronic health records in primary care [75]
- Primary Care Assessment Survey [76]
- Short Short Questionnaire for Out-of-Hours Care [77]
- Adult Primary Care Assessment Tool (short and expanded versions) [21]
- Canadian Community Health Survey (CCHS) [78]
- Patient Experience Questionnaire (PEQ) [79]
- Patient Satisfaction with Medical Encounters Questionnaire [80]
- International Health Policy Survey (Commonwealth Fund, different versions) [16,18,20,81]
- Health Care Quality Survey (Commonwealth Fund, different versions) [17,19]
- Patient-Reported Physician Cultural Competence (PRPCC) score [82]
- Ambulatory Care Experiences Survey (ACES) [31]
- QUOTE for migrants [83]
- Patient-Doctor Relationship Questionnaire (PDRQ-9) [84]
- Patient Satisfaction with Out-of-Hours Primary Care Survey [85]
- SF-36 (and SF-12) [86]
- Patients Assessment Chronic Illness Care (PACIC) Questionnaire [87]
- Health-Care, Self-Determination Theory Packet [88]
- Patients Satisfaction in Resident and Attending Ambulatory Care Clinics Questionnaire [89]
- ERUOPEP [15]
- Improving Practice Questionnaire (IPQ) [90]
- Eurocommunication Patient Questionnaire [91]
- QUOTE [92]

Phase 2: classification, selection, rephrasing and new questions

All questions from the retrieved questionnaires were classified according to the dimensions to measure primary care. The result of this classification is presented in Table 2. As some questions were classified in more than one dimension, the total number in the figure is higher than the number of questions that emerged from the search.

For each of the dimensions, the researchers selected questions potentially relevant to this study. An example of a question which was not included in the first selection phase is about the health plans of the patients. This question is country specific and not suitable for comparison between countries. After this first phase, 138 questions for GPs and 117 for patients remained.

Table 2 Classification of questions according to the dimensions to measure primary care

Dimension	Number of questions in GP questionnaires	Number of questions in patient questionnaires
Governance	60	-
Economic questions	92	-
Workforce development	67	-
Accessibility	85	548
Continuity	227	121
Coordination	178	137
Comprehensiveness and quality	273	856
Equity	59	45
Efficiency	115	-
Patient autonomy	-	56
Background	172	570
Other	48	234

Phase 3: consensus rounds

During the consensus phase, the questions on the provisional were further narrowed (based on the exclusion criteria) and rephrased, where necessary. For instance, as more and more GPs work part-time, the question about the number of GP colleagues working in the same

practice was further specified to include the number of full-time equivalents (FTEs) in addition to the absolute number. The number of remaining questions after each round is indicated in Figure 1.

Pilot

The pilots showed that the questionnaires were reasonably well understood and easily administered, suggesting acceptable clarity and applicability. However, both the GP and Patient Experiences questionnaires were too long, as the average time needed for completion exceeded the set limits of 30 minutes for GPs and 20 minutes for patients. Furthermore, in the GP questionnaire mistakes were identified (e.g. names of equipment were incorrect). Some questions in the patients' questionnaire appeared too difficult. The pilot resulted in a further reduction of the questionnaire, reformulation of several questions and the development of a short practice questionnaire about general characteristics of the practice (e.g. cleanliness of the waiting room).

GP questionnaire

The final GP questionnaire (see Appendix 1 – available online) contains 60 questions (25 of which have two or more subquestions). The majority of the questions have prestructured multiple choice answers. In 13 questions, GPs are also asked to fill in numerical answers (e.g. a percentage or a number of hours).

To gain insight into the relationship between GPs and the broader contacts of primary care, there are 12 questions about 'coordination and cooperation' between GPs and other disciplines. Eleven questions about the 'continuity of care' provided by the GPs concentrate on disease management and on referrals and information exchange. Special attention is paid to medical record keeping. 'Quality of care' is measured with three questions regarding the use of guidelines and feedback from colleagues or authorities. 'Comprehensiveness of care services' is reflected in 12 questions, dealing with the available equipment and the GPs' task profiles (e.g. the range of problems for which the GP is the first point of contact). Finally, nine questions covering 'accessibility of care'

can be divided into those about physical access (distance to the practice and opening hours) and those about financial access to care services.

The European study on GP Task Profiles, carried out in 30 European countries in 1992–93, is a major source for the GP questionnaire [10]. Several questions were copied from this questionnaire. Other important sources are, for example, international surveys by the Commonwealth Fund [8,11,12] (questions about financial incentives, guideline use and medical record keeping) and Starfield's Primary Care Assessment Tool (question about care for uninsured persons) [13].

For several topics, no examples of existing questions were found and new questions had to be formulated. These topics were involvement of GPs in disease management programmes, equity in access and patient involvement in the decision-making process.

Patient Experiences questionnaire

The Patient Experiences questionnaire, dealing with the experiences of patients with their GP (see Appendix B – available online), contains 41 multiple choice questions (10 of which have two or more sub questions). Many questions ask to what extent the patient agrees with a statement. The questionnaire is meant to be completed in the GP's waiting room by patients after consultation with their GP. The 18 questions which concentrate on the patient's background concern the patient's socio-economic status, perceived health, reason for visiting the GP, and visits to medical specialists and hospitals. Six questions deal with measuring experiences with 'continuity of care', e.g. the use of medical records. 'Quality of care' as experienced by patients is measured in 13 questions (e.g. about the satisfaction of care needs in connection to the patient's relationship with the GP, aspects of communication, safety, complaint handling and preventive activities). As in the GP questionnaire, the 14 questions about the 'accessibility of care' can be divided into physical and financial access. These questions also include the time the GP has available for the patient, the availability of home visits and waiting times. Three questions pay attention to 'equity in access' and one question to 'equity in treatment'. 'Coordination' is measured with five questions on experiences of coordination in the case of referral and on treatment by a practice nurse. To mirror the questions in the GP questionnaire about autonomy, patients are asked about their

involvement in decision making and referrals. 'Comprehensiveness of services' is mirrored in a question about patients' views on the breadth of the clinical task profile of services offered by the GP. Finally, two questions specifically related to avoidable hospitalisation were included. Major sources for this questionnaire were the Consumer Quality Index for GPs [14], the EUROPEP [15], several international Commonwealth Fund questionnaires [16–20] and Starfield's Adult Primary Care Assessment Tool [21]. Compared with the GP questionnaires, more questions for patients were identified in the domain of equity in access and treatment. As few questions were found on patient autonomy, new questions had to be developed on this theme.

Patient Values questionnaire

Next, a Patient Values questionnaire was developed. Measuring what patients consider important enables the weighting of their experiences [22]. The Patient Values questionnaire contains 19 questions (seven of which have three or more subquestions). Again, most questions are statements with multiple choice answers. A few questions ask the patient to choose from a list what they consider most important and fill in a number. The 12 questions asking about the patient's background are similar to those in the Patient Experiences questionnaire. Three questions contain statements asking patients about the importance of certain aspects of care (e.g. 'How important is it that the practice has extensive opening hours?').

Finally, four questions focus on communication between GPs and patients. The statements in these questions were developed by the GULiVer partnership based on their research on 'tips' from lay people on how medical consultations could become more successful from their perspective [23].

Practice questionnaire

A 12-question practice questionnaire was developed to record the response rate among patients during the implementation of the survey and to measure practice-related indicators with regard to the communication of opening hours, and equity in access (e.g. for handicapped persons). Most questions were based on the European Practice Assessment indicators [24].

Discussion

The four questionnaires have been developed to characterise the organisation and delivery of primary care and to compare and analyse its outcomes. The development of questionnaires for a multicountry study on broad themes such as quality, costs and equity in primary care requires a balance between methodological requirements and practical feasibility. Indeed, all dimensions deserved to be thoroughly investigated, although they may be difficult to measure reliably, but it must be accepted that only a limited set of questions can be asked. Nonetheless, the QUALICOPC consortium has been able to produce the four questionnaires—as far as possible—based on existing, validated questionnaires and tested through a pilot survey in three countries. A limitation of the pilot survey is that it was carried out in only three countries. However, much attention has been paid to having valid translations in each language. In each country, an official back-and-forth translation procedure is used for the questionnaires, in which translators are asked to take comprehensibility into account. Another limitation of the questionnaire development is that questions, derived from various validated sources, often had to be ‘processed’ to make them suitable for the QUALICOPC study. This may have resulted in a loss of validity and needs to be taken into account in the analysis phase. The questionnaires for GPs and patients contain questions that go beyond general practice. Furthermore, data about primary care (e.g. about its costs) will be gathered at the national level in available databases. Nevertheless, results regarding quality of primary care as a whole need to be interpreted with care. The dimension ‘Governance’ has not been covered in any of the questionnaires, because aspects of governance are relatively distant from daily reality in primary care. However, information on governance will be used and derived from the PHAMEU database. Relatively new topics that will be explored in the QUALICOPC study are equity in access and treatment, patient autonomy, disease management, avoidable hospitalisation and patient experiences with primary care in general. There are also aspects of care which might be interesting, but are not included in these questionnaires. This included new developments around telemedicine, but also the experiences of patients around disease management programmes. Equity in health can also not be measured through this survey, as we only include patients who visit GP practices

and, moreover, we do not measure health outcomes. Several questions had to be omitted to keep the length of the questionnaire reasonable. Because the sources were identified from Western countries, the questionnaires that we developed are more likely to be suitable for use in Western countries than in others. However, the 35 countries in which the questionnaires will be used in the context of the QUALICOPC study match this profile well. The results of the study will add to the available evidence on the relationship between the strength of primary care systems and their outcomes. The data from the 35 countries will be linked to the practices and their patients. Analyses of the data will provide insight into variations between countries at the level of the patient, GP practice and country. The patient questionnaires may also be suitable for use at the practical level by GPs to analyse developments in the GP practice by inviting a sample of patients every year to complete a questionnaire.

References

- 1 Schäfer WLA, Boerma WG, Kringos DS et al. QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care. *BMC Family Practice* 2011;12:115.
- 2 Schäfer W, Groenewegen PP, Hansen J, Black N. Priorities for health services research in primary care. *Quality in Primary Care* 2011;19:77–83.
- 3 Kringos DS, Boerma WG, Bourgueil Y et al. The European primary care monitor: structure, process and outcome indicators. *BMC Family Practice* 2010;11:81.
- 4 Boerma WG, Dubois CA. Mapping primary care accross Europe. In: Saltman RB, Rico A, Boerma WG (eds). *Primary Care in the Driver's Seat? Organizational reform in European primary care*. Open University Press: Buckingham, 2006; 22–49.
- 5 Health Council of the Netherlands. *European Primary Care Report*. Health Council of the Netherlands: The Hague, 2004.
- 6 Kringos DS, Boerma WG, Hutchinson A, van der Zee J, Groenewegen PP. The breadth of primary care: a systematic literature review of its core dimensions. *BMC Health Services Research* 2010;10:65.
- 7 Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Quarterly* 2005;83:457–502.
- 8 The Commonwealth Fund. *International Health Policy Survey of Primary Care Physicians in Eleven Countries*. The Commonwealth Fund: New York, 2009.
- 9 Boerma W. *Task Profiles of General Practitioners in Europe*. NIVEL: Utrecht, 2003.
- 10 Boerma W. *Profiles of General Practice in Europe: An international study of variation in the tasks of general practitioners*. NIVEL: Utrecht, 2003.
- 11 Schoen C, Osborn R, Huynh PT, Doty M, Peugh J, Zapert K. On the front lines of care: primary care doctors' office systems, experiences, and views in seven countries. *Health Affairs (Millwood)* 2006;25(6):w555–71.
- 12 Commonwealth Fund. *National Survey of Physicians on Practice Experience*. Commonwealth Fund: New York, 2003.

- 13 Starfield B. Primary Care Assessment Tool – Expanded Version (Provider survey). 1998.
- 14 Meuwissen LE, de Bakker LH. ‘Consumer Quality-index huisartsenzorg’ meet patiëntenervaringen en vergelijkt huisartsenpraktijken [Consumer Quality Index GP care’ measures patient experiences and compares GP practices]. *Nederlands Tijdschrift voor Geneeskunde* 2009; 153(A 180).
- 15 Wensing M, Baker R, Vedsted P et al. EUROPEP 2006. Centre of Quality of Care Research, 2006. [www. topaseurope.eu/files/ Europep%202006rapport_0.pdf](http://www.topaseurope.eu/files/Europep%202006rapport_0.pdf)
- 16 Commonwealth Fund. International Health Policy Survey of Adults’ Experiences with Primary Care. Commonwealth Fund: New York, 2004.
- 17 Commonwealth Fund. Health Care Quality Survey. Commonwealth Fund: New York, 2006.
- 18 Commonwealth Fund. International Health Policy Survey of Sicker Adults. Commonwealth Fund: New York, 2008.
- 19 Commonwealth Fund. Survey on Disparities in Quality of Health Care. Commonwealth Fund: New York, 2001.
- 20 Commonwealth Fund. International Health Policy Survey of Adults with Health Problems. Commonwealth Fund: New York, 2002.
- 21 Shi L, Starfield B, Xu J. Validating the Adult Primary Care Assessment Tool. *Journal of Family Practice* 2001; 50(2):161–75w.
- 22 Delnoij DM, Rademakers JJ, Groenewegen PP. The Dutch Consumer Quality Index: an example of stakeholder involvement in indicator development. *BMC Health Services Research* 2010;10:88.
- 23 Bensing JM, Deveugele M, Moretti F et al. How to make the medical consultation more successful from a patient’s perspective? Tips for doctors and patients from lay people in the United Kingdom, Italy, Belgium and the Netherlands. *Patient Education and Counseling* 2011;84:287–93.
- 24 Engels Y, Campbell S, Dautzenberg M et al. Developing a framework of, and quality indicators for, general practice management in Europe. *Family Practice* 2005; 22:215–22.

- 25 Boerma W, Kringos DS, Verschuuren M, Pellny M, Bulc M. Primary Care Quality Management in Slovenia, 2008. WHO, Copenhagen. <http://www.nivel.nl/sites/default/files/bestanden/Primary-care-quality-management-in-SLOV.pdf>
- 26 Westert GP, Schellevis FG, Bakker DH, Groenewegen PP, Bensing JM, Van der Zee J. Monitoring health inequalities through general practice: the Second Dutch National Survey of General Practice. *European Journal of Public Health* 2005;15:59–65.
- 27 Kringos DS et al. A snapshot of the organization and provision of primary care in Turkey. *BMC Health Services Research* 2011;11:90.
- 28 Australian Capital Territory Department of Health. GP Snapshot Survey. Australian Capital Territory Department of Health: Canberra, 2009.
- 29 Centers for Disease Control and Prevention. National Ambulatory Medical Care Survey 2010. Centers for Disease Control and Prevention: Atlanta, 2009.
- 30 Eurostat. European Health Interview Survey. Eurostat: Luxembourg, 2008.
- 31 Tufts Medical Center ifCRaHPS. Ambulatory Care Experiences Survey (ACES). Tufts Medical Center: Boston, 2003.
- 32 Leiblum SR, Schnall E, Seehuus M, DeMaria A. To BATHE or not to BATHE: patient satisfaction with visits to their family physician. *Clinical Research and Methods* 2008;40:407–11.
- 33 Agha Z, Schapira RM, Laud PW, McNutt G, Roter DL. Patient satisfaction with physician-patient communication during telemedicine. *Telemedicine and e-Health* 2009;15:830–9.
- 34 CAHPS. Adult Primary Care Questionnaire 1.0: Clinician & Group Survey (6-points scale). AHRQ, Rockville, 2009.
- 35 National Primary Care Research and Development Centre. General Practice Assessment Questionnaire (GPAQ). National Primary Care Research and Development Centre: Manchester, 2010.
- 36 Zebiene E, Svab I, Sapoka V et al. Agreement in patient-physician communication in primary care: a study from Central and Eastern Europe. *Patient Education and Counseling* 2008;73:246–50.
- 37 Howie JG, Heaney DJ, Maxwell M, Walker JJ, Freeman GK, Rai H. Quality at general practice consultations: cross-sectional survey. *BMJ* 1999;319(7212):738–43.

- 38 McGuinness C, Sibthorpe B. Development and initial validation of a measure of coordination of health care. *International Journal of Quality in Health Care* 2003; 15:309–18.
- 39 National Health Service. The National Surveys of NHS Patients: general practice 2002 – questionnaire. National Centre for Social Research, Middlesex. 2002.
- 40 Bindman AB, Grumbach K, Osmond D et al. Preventable hospitalizations and access to health care. *JAMA* 1995;274:305–11.
- 41 Van de Lisdonk EH. Nijmeegse Verwachtingen Lijst [Expectancies List from Nijmegen]. http://www.nivel.nl/sites/default/files/bestanden/ns2_r2_h07.pdf. 1985.
- 42 UNESCO. International Standard Classification of Education (ISCED). http://www.unesco.org/education/information/nfsunesco/doc/isced_1997.htm. 1997.
- 43 Hodgetts G, Broers T, Godwin M. Smoking behaviour, knowledge and attitudes among family medicine physicians and nurses in Bosnia and Herzegovina. *BMC Family Practice* 2004;5:12.
- 44 Himmel W, Kochen MM. How do academic heads of departments of general practice organize patient care? A European survey. *British Journal of General Practice* 1995;45(394):231–4.
- 45 Van den Brink-Muinen A, Van Dulmen AJ, Bensing JM. Eurocommunication II: a comparative study between countries in Central and Western Europe on doctor–patient communication in general practice: final report. NIVEL: Utrecht, 2003. www.nivel.nl/sites/default/files/bestanden/EurocommunicationII.pdf
- 46 Sandvik H, Cho HJ. Attitudes to family practice registration programmes. Survey of Korean and Norwegian family doctors. *Family Practice* 2002;19:72–6.
- 47 Agosta LJ. Patient satisfaction with nurse practitioner delivered primary health care services. Louisiana State University and Agricultural and Mechanical College. Unpublished, 2005. etd.lsu.edu/docs/available/etd-07012005-130406/unrestricted/Agosta_dis.pdf
- 48 Ahlen GC, Mattsson B, Gunnarsson RK. Physician patient questionnaire to assess physician patient agreement at the consultation. *Family Practice* 2007;24:498– 503.

- 49 Allan J, Schattner P, Stocks N, Ramsay E. Does patient satisfaction with general practice change over a decade? *BMC Family Practice* 2009;10:13.
- 50 Baker D, Mead N, Campbell S. Inequalities in morbidity and consulting behaviour for socially vulnerable groups. *British Journal of General Practice* 2002;52(475):124–30.
- 51 Baker R, Boulton M, Windridge K, Tarrant C, Bankart J, Freeman GK. Interpersonal continuity of care: a cross-sectional survey of primary care patients' preferences and their experiences. *British Journal of General Practice* 2007;57(537):283–9.
- 52 Barry DT, Moore BA, Pantalon MV et al. Patient satisfaction with primary care office-based buprenorphine/ naloxone treatment. *Journal of General Internal Medicine* 2007;22:242–5.
- 53 Berendsen AJ, Groenier KH, de Jong GM et al. Assessment of patients' experiences across the interface between primary and secondary care: Consumer Quality Index continuum of care. *Patient Education and Counseling* 2009;77:123–7.
- 54 Agency for Healthcare Research and Quality, Rockville. CAHPS. American Indian Survey. 2009 March 4.
- 55 Department of Community and Family Medicine. Duke Health Profile. Duke University Medical Center, Durham, N.C. USA, 2007.
- 56 Department of Human Services. Victorian Population Health Survey. Victorian Government Department of Human Services, Melbourne, Victoria, 2007.
- 57 Esch BM. Patient satisfaction with primary care: an observational study comparing anthroposophic and conventional care. *Health and Quality of Life Outcomes* 2008;6:74. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2570361/>
- 58 Euroqol. EQ 5D [This is a sample questionnaire-it needs to be applied for]. EuroQol Group, Rotterdam, 2010.
- 59 Fleming NS, Herrin J, Roberts W, Couch C, Ballard DJ. Patient-centeredness and timeliness in a primary care network: baseline analysis and power assessment for detection of the effects of an electronic health record. *Proceedings (Baylor University Medical Center)* 2006; 19:314–19.

- 60 Frosthalm L, Fink P, Oernboel E et al. The uncertain consultation and patient satisfaction: the impact of patients' illness perceptions and a randomized controlled trial on the training of physicians' communication skills. *Psychosomatic Medicine* 2005;67:897–905.
- 61 Gagnon M, Hebert R, Dube M, Dubois MF. Development and validation of the Health Care Satisfaction Questionnaire (HCSQ) in elders. *Journal of Nursing Measurement* 2006;14:190–204.
- 62 Garratt AM, Danielsen K, Forland O, Hunskaar S. The Patient Experiences Questionnaire for Out-of-Hours Care (PEQ-OHC): data quality, reliability, and validity. *Scandinavian Journal of Primary Health Care* 2010; 28(2):95–101.
- 63 Glasgow RE, Emont S, Miller DC. Assessing delivery of the five 'As' for patient-centered counseling. *Health Promotion International* 2006; 21:245–55.
- 64 Grunfeld E, Fitzpatrick R, Mant D et al. Comparison of breast cancer patient satisfaction with follow-up in primary care versus specialist care: results from a randomized controlled trial. *British Journal of General Practice* 1999;49(446):705–10.
- 65 Hadjistavropoulos H, Biem H, Sharpe D, Bourgault-Fagnou M, Janzen J. Patient perceptions of hospital discharge: reliability and validity of a Patient Continuity of Care Questionnaire. *International Journal for Quality in Health Care* 2008;20:314–23.
- 66 Hathorne G, Richardson J, Day N. Using the Assessment of Quality of Life (AQoL) Version 1. 2010. <http://www.buseco.monash.edu.au/centres/che/pubs/tr12.pdf>
- 67 Jiang L, Gan C, Kao B et al. Consumer satisfaction with public health care in China. *Journal of Social Sciences* 2009;5:223–35.
- 68 Kersnik J, Ropret T. An evaluation of patient satisfaction amongst family practice patients with diverse ethnic backgrounds. *Swiss Medical Weekly* 2002;132(9–10): 121–4.
- 69 Kinnersley P, Stott N, Peters T, Harvey I, Hackett P. A comparison of methods for measuring patient satisfaction with consultations in primary care. *Family Practice* 1996;13:41–51.
- 70 Chu-Weininger MY, Balkrishnan R. Consumer satisfaction with primary care provider choice and associated trust. *BMC Health Services Research* 2006;6:139. www.biomedcentral.com/1472-6963/6/139

- 71 Mahfouz AA, Al Sharif AI, El Gama MN, Kisha AH. Primary health care services utilization and satisfaction among the elderly in Asir region, Saudi Arabia. *East Mediterranean Health Journal* 2004;10:365–71.
- 72 Marcinowicz L, Rybaczuk M, Grebowski R, Chlabicz S. A short questionnaire for measuring the quality of patient visits to family practices. *International Journal for Quality in Health Care* 2010; 22:294–301.
- 73 National Primary Care Research and Development Centre. Out-of-Hours Patient Questionnaire. NPCRDC, Manchester, 2007.
- 74 NHS Department of Health. The GP Patient Survey Questionnaire. Department of Health: London, 2010.
- 75 Pyper C, Amery J, Watson M, Crook C. Access to electronic health records in primary care – a survey of patients’ views. *Medical Science Monitor* 2004;10(11): SR17–22.
- 76 Safran DG, Kosinski M, Tarlov AR et al. The Primary Care Assessment Survey: tests of data quality and measurement performance. *Medical Care* 1998;36:728–39.
- 77 Salisbury C, Burgess A, Lattimer V et al. Developing a standard short questionnaire for the assessment of patient satisfaction with out-of-hours primary care. *Family Practice* 2005;22:560–9.
- 78 Statistics Canada. Canadian Community Health Survey 2009 Questionnaire. Statistics Canada: Ottawa, 2009.
- 79 Steine S, Finset A, Laerum E. A new, brief questionnaire (PEQ) developed in primary health care for measuring patients’ experience of interaction, emotion and consultation outcome. *Family Practice* 2001;18:410–18.
- 80 Takemura Y, Liu J, Atsumi R, Tsuda T. Development of a questionnaire to evaluate patient satisfaction with medical encounters. *Tohoku Journal of Experimental Medicine* 2006;210:373–81.
- 81 Commonwealth Fund. International Health Policy Survey. Commonwealth Fund, New York, 2001.
- 82 Thom DH, Tirado MD, Woon TL, McBride MR. Development and evaluation of a cultural competency training curriculum. *BMC Medical Education* 2006;6:38.

- 83 Uiters E. Primary Health Care Use among Ethnic Minorities in the Netherlands: a comparative study. NIVEL, Utrecht, 2007. www.nivel.nl/sites/default/files/bestanden/Primary-health-care-use-among-ethnic-minorities-in-the-Netherlands-a-comparative-study-2007.pdf
- 84 Van der Feltz-Cornelis CM. Patient–Doctor Relationship Questionnaire (PDRQ-9) in primary care: development and psychometric evaluation. *General Hospital Psychiatry* 2004;26:115–20.
- 85 van Uden CJ, Ament AJ, Hobma SO, Zwietering PJ, Crebolder HF. Patient satisfaction with out-of-hours primary care in the Netherlands. *BMC Health Services Research* 2005;5(1):6.
- 86 Van der Zee KI, Sanderman R. Het meten van de algemene gezondheidstoestand met de RAND-36 [Dutch version: Measuring general health status by SF-36]. Noordelijk Centrum voor Gezondheidsvraagstukken: Groningen, 2010.
- 87 Wensing M, van Lieshout J, Jung HP, Hermsen J, Rosemann T. The Patients Assessment Chronic Illness Care (PACIC) questionnaire in the Netherlands: a validation study in rural general practice. *BMC Health Services Research* 2008;8:182.
- 88 Williams GC, Ryan RM, Deci EL. Health Care, Self-Determination Theory Questionnaire. 2010. www.selfdeterminationtheory.org/questionnaires/10-questionnaires/51
- 89 Yancy WS Jr, Macpherson DS, Hanusa BH et al. Patient satisfaction in resident and attending ambulatory care clinics. *Journal of General Internal Medicine* 2001;16: 755–62.
- 90 Carter M, Roland M, Bower P, Gask L, Greco M, Jenner D. Improving your Practice with Patient Surveys. NPCRDC: Manchester, 2005.
- 91 Kerssens JJ, Groenewegen PP, Sixma HJ et al. Comparison of patient evaluations of health care quality in relation to WHO measures of achievement in 12 European countries. *Bulletin of the World Health Organization* 2004;82(2):106–14.
- 92 Zebiene E, Svab I, Sapoka V et al. Agreement in patient-physician communication in primary care: a study from Central and Eastern Europe. *Patient Education and Counseling* 2008;73:246–50.

Appendices

Appendix 1 QUALICOPC questionnaires

Appendix A: QUALICOPC questionnaire for general practitioners

Question	Response categories	Source(s)	Theme(s)
1. Are you male or female?	<input type="checkbox"/> Male <input type="checkbox"/> Female	New	BACK
2. What is your year of birth? Please fill in:	Year of birth: 19__	New	BACK
3. Were you born in this country?	<input type="checkbox"/> Yes <input type="checkbox"/> No	New	BACK
4. How would you characterise the place where you are currently practising?	<input type="checkbox"/> Big (inner) city <input type="checkbox"/> Suburbs <input type="checkbox"/> (Small) town <input type="checkbox"/> Mixed urban-rural <input type="checkbox"/> Rural	Ref. 10, Q1.7 to make comparison possible	PRACC
5. What is the (estimated) size of your practice population? (In a joint practice, estimate your share of the population). If you do not have a formal list, please estimate the number of people who normally rely on you for primary medical care.	Number of patients: ____	Question and response based on Ref. 10, Q1.12	PRACC
6. To what extent do you think your practice population compares to the average national level with respect to the following categories? 1. Elderly people (over 70 years) 2. Socially disadvantaged people 3. Ethnic minority people	Below average Average Above average Don't know <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Question and response based on Ref. 10, Q1.18 but updated (other groups of people)	PRACC
7. To what extent do you think that the patient turnover in your practice compares to other practices in this country?	Below average Average Above average Don't know <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	New	PRACC
8. How many hours per week do you work as a GP (excluding additional jobs and on-call or out-of-hours services)?	____ hours per week	Response categories based on Ref. 10, Q1.4	EFF
9. How many of these hours do you spend on direct patient care (consultations, home visits, telephone consultations)?	____ hours per week	Based on Ref. 25: combination of a set of Q11-13	EFF
10. How many patient contacts do you have on a normal working day? 1. Face-to-face in your office (number) 2. By telephone 3. By email	____ per day ____ per day ____ per day	Ref. 10, combination of a set of Q1.13-1.14+ update (email)	EFF
11. How long does a regular patient consultation in your office usually take?	____ minutes	Based on Ref. 10, Q1.16 but changed (not only appointment system)	EFF

12. In a normal working week, how many patients do you see?				New	EFF
1. At home visits	___ per week				
2. In hospital	___ per week				
3. In homes for the elderly	___ per week				
4. In other institutions or settings	___ per week				
13. In the past 3 working months (excluding holidays, etc.), how often and for how long did you have on-call duties during evenings, nights and weekends?				Ref. 26	EFF
1. During evening(s)	___ times; in total ___hours				
2. During night(s)	___ times; in total ___hours				
3. During weekend days	___ times; in total ___hours				
14. Beside your work as a GP in this practice, do you have any other <u>paid</u> professional activities? (multiple answers possible)	<input type="checkbox"/> No <input type="checkbox"/> Yes, as a physician for privately paying patients <input type="checkbox"/> Yes, in a residential setting (e.g. nursing home, prison) <input type="checkbox"/> Yes, as a company doctor <input type="checkbox"/> Yes, in teaching/medical education <input type="checkbox"/> Yes, other			New	WORK
15. As a GP, are you self-employed or in salaried employment?	<input type="checkbox"/> Salaried employment with centre or authority <input type="checkbox"/> Salaried employment with other GP <input type="checkbox"/> Self-employed with contract(s) with health service, insurance or authority <input type="checkbox"/> Self-employed without contract(s)			Ref. 10, Q1.3 updated	ECON
16. For each of the following components please estimate whether they contribute to your income as a GP, and if so, up to what percentage.	<input type="checkbox"/> Salary ___% <input type="checkbox"/> Capitation payments (a fixed sum per patient for a certain period of time) ___% <input type="checkbox"/> Fee for services from third-party payer ___% <input type="checkbox"/> Out-of-pocket payments from patients ___% <input type="checkbox"/> Performance payments (for instance related to targets) ___% <input type="checkbox"/> Other sources ___%			Ref. 25, Q36 (percentages are new)	ECON
17. Can you receive an extra financial incentive or bonus for:	Yes	No	Don't know	Ref. 8, Q26; Ref. 11, exhibit 6; rephrased and different topics	ECON; EQ
1. Management of patients with diabetes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2. Management of patients with hypertension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3. Achievement of targets for screening or prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4. Referral rates below a certain level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5. Having disadvantaged patients in your practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6. Working in a remote area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

18. Do you work alone or in shared accommodation with one or more GPs and/or medical specialists? Please also fill in their number of Full-Time Equivalents (FTEs). (For instance, one doctor working 5 days a week and 1 other doctor working 2.5 days a week makes 1.5 FTEs).	<input type="checkbox"/> Alone <input type="checkbox"/> With ___ other GPs in shared accommodation <input type="checkbox"/> With ___ medical specialist(s) in shared accommodation	FTE (including yourself) counting for ___FTE counting for ___FTE	Ref. 10, Q1.11, FTE added (nowadays many GPs work part-time)	WORK																				
19. Which of the following disciplines are working in your practice/centre?	<input type="checkbox"/> 1. Receptionist/medical secretary <input type="checkbox"/> 2. Practice nurse <input type="checkbox"/> 3. Community/home care nurse <input type="checkbox"/> 4. Psychiatric nurse <input type="checkbox"/> 5. Nurse practitioner (function between physician and nurse) <input type="checkbox"/> 6. Assistant for laboratory work <input type="checkbox"/> 7. Manager of the centre or practice (not a physician) <input type="checkbox"/> 8. Midwife <input type="checkbox"/> 9. Physiotherapist <input type="checkbox"/> 10. Dentist <input type="checkbox"/> 11. Pharmacist <input type="checkbox"/> 12. Social worker		Ref. 10, Q1.19 & Ref. 25, Q18 (+ some extra disciplines based on expert opinion)	WORK; COOR																				
20. Do you use clinical guidelines for the treatment of the following?	<table border="0"> <thead> <tr> <th></th> <th>Yes</th> <th>No</th> <th>Not available</th> </tr> </thead> <tbody> <tr> <td>1. Chronic heart failure</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>2. Asthma</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>3. COPD</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>4. Diabetes</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		Yes	No	Not available	1. Chronic heart failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Asthma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. COPD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Diabetes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Guideline	Ref. 8, Q7 with slight adjustments	CONT; QUAL
	Yes	No	Not available																					
1. Chronic heart failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																					
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3. COPD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																					
4. Diabetes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																					
21. In the past 12 months, have you been involved in a disease management programme for patients with the following chronic conditions? (Such programmes are multidisciplinary approaches across practices, often based on protocols).	<table border="0"> <thead> <tr> <th></th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Chronic heart failure</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>2. Asthma</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>3. COPD</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>4. Diabetes</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		Yes	No	1. Chronic heart failure	<input type="checkbox"/>	<input type="checkbox"/>	2. Asthma	<input type="checkbox"/>	<input type="checkbox"/>	3. COPD	<input type="checkbox"/>	<input type="checkbox"/>	4. Diabetes	<input type="checkbox"/>	<input type="checkbox"/>		New	CONT and COOR; QUAL					
	Yes	No																						
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3. COPD	<input type="checkbox"/>	<input type="checkbox"/>																						
4. Diabetes	<input type="checkbox"/>	<input type="checkbox"/>																						
22. In the past 12 months, has the following occurred in your practice/centre?	<table border="0"> <thead> <tr> <th></th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Feedback on your prescriptions or referrals by health authority or insurer</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>2. Feedback from colleague GPs (peer review or practice visitation)</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>3. Investigation into the satisfaction of your patients</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		Yes	No	1. Feedback on your prescriptions or referrals by health authority or insurer	<input type="checkbox"/>	<input type="checkbox"/>	2. Feedback from colleague GPs (peer review or practice visitation)	<input type="checkbox"/>	<input type="checkbox"/>	3. Investigation into the satisfaction of your patients	<input type="checkbox"/>	<input type="checkbox"/>		Ref. 25, Q1	CONT; QUAL								
	Yes	No																						
1. Feedback on your prescriptions or referrals by health authority or insurer	<input type="checkbox"/>	<input type="checkbox"/>																						
2. Feedback from colleague GPs (peer review or practice visitation)	<input type="checkbox"/>	<input type="checkbox"/>																						
3. Investigation into the satisfaction of your patients	<input type="checkbox"/>	<input type="checkbox"/>																						
23. In cases of referral, who usually decides where the patient is referred to?	<input type="checkbox"/> I do <input type="checkbox"/> The patient does <input type="checkbox"/> It is a shared decision		New	CONT; COOR																				

24. In cases of referral, to what extent do you take into account the following considerations?	Always	Sometimes	Never	New	CONT; COOR	
1. The patient's preference where to go	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2. The travel distance for the patient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
3. Your previous experiences with the medical specialist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
4. Comparative performance information on medical specialists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
5. Waiting time for the patient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
6. Costs for the patient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
25. Please tick the equipment used in your practice by yourself or your staff:	Functions			Ref. 10, Q1.22	COMPR	
Laboratory	<input type="checkbox"/> Audiometer			(some small adjustments)		
<input type="checkbox"/> Haemoglobinometer	<input type="checkbox"/> Bicycle ergometer					
<input type="checkbox"/> Any blood glucose test set	<input type="checkbox"/> Eye tonometer					
<input type="checkbox"/> Any cholesterol meter	<input type="checkbox"/> Peak flow/PEF meter					
<input type="checkbox"/> Blood-cell counter	<input type="checkbox"/> Spirometer					
Imaging	<input type="checkbox"/> Electrocardiograph					
<input type="checkbox"/> Ophthalmoscope	<input type="checkbox"/> Blood-pressure meter					
<input type="checkbox"/> Proctoscope	<input type="checkbox"/> Infusion set					
<input type="checkbox"/> Otoscope	<input type="checkbox"/> Doctor's bag for emergencies and home visits					
<input type="checkbox"/> Gastroscope	Other					
<input type="checkbox"/> Sigmoidoscope	<input type="checkbox"/> Urine catheter					
<input type="checkbox"/> X-ray	<input type="checkbox"/> Coagulometer					
<input type="checkbox"/> Ultrasound for abdomen/fetus	<input type="checkbox"/> Set for minor surgery					
<input type="checkbox"/> Microscope	<input type="checkbox"/> Suture set					
	<input type="checkbox"/> Defibrillator					
	<input type="checkbox"/> Disposable syringes					
	<input type="checkbox"/> Disposable gloves					
	<input type="checkbox"/> Refrigerator for medicines					
	<input type="checkbox"/> Resuscitation equipment					
26. What access do you have to laboratory facilities?	<input type="checkbox"/> Within my practice/centre			Ref. 10, Q1.23,	COMPR	
	<input type="checkbox"/> Easy access outside my practice/centre			changed		
	<input type="checkbox"/> Insufficient access			answering	categories	
27. What access do you have to X-ray facilities?	<input type="checkbox"/> Within my practice/centre			Ref. 10, Q1.23,	COMPR	
	<input type="checkbox"/> Easy access outside my practice/centre			changed		
	<input type="checkbox"/> Insufficient access			answering	categories	
28. What is the distance by road from your (main) practice building to:	In the same building	Less than 10 km	11–20 km	More than 20 km	Ref. 10, Q1.0,	ACCS
1. The nearest GP practice (not in your group or centre)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	changed	
2. The nearest consultant/outpatient clinic (independent or part of hospital)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	answering	categories
3. The nearest general or university hospital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
29. How many hours on an average working day is your practice/centre open for patient care (lunch breaks excluded)?	___ hours per working day			New	ACCS	

30. Is it possible for your patients to visit your practice/centre:		Ref. 27, Q20,	ACCS
1. After 18.00 h (at least once per week)	<input type="checkbox"/> Yes <input type="checkbox"/> No	slightly	
2. On a weekend day (at least once per month)	<input type="checkbox"/> Yes <input type="checkbox"/> No	different	
		wording	
31. During evenings and nights on weekdays, what access do your patients have to (non-emergency) medical services?	<input type="checkbox"/> Not applicable (I am always available for my patients) <input type="checkbox"/> I am available on a rota basis with a group of GPs <input type="checkbox"/> I am not available, but other GPs are available (on a rota basis) <input type="checkbox"/> Other physicians (not GPs) provide out-of-hours care <input type="checkbox"/> Other arrangements are available	New, but answering categories derived from Ref. 10, Q1.21	ACCS
32. On Saturdays and Sundays, what access do your patients have to (non-emergency) medical services?	<input type="checkbox"/> Not applicable (I am always available for my patients) <input type="checkbox"/> I am available on a rota basis with a group of GPs <input type="checkbox"/> I am not available, but other GPs are available (on a rota basis) <input type="checkbox"/> Other physicians (not GPs) provide out-of-hours care <input type="checkbox"/> Other arrangements are available	New, but answering categories derived from Ref. 10, Q1.21	ACCS
33. What percentage of your patient consultations are by appointment?	About _____%	Ref. 27, Q21	ACCS
34. Do you offer a walk-in hour?	<input type="checkbox"/> Yes <input type="checkbox"/> No	New	ACCS
35. In the past 12 months, have you ever done the following to reduce financial obstacles to disadvantaged patients?		New	EQ; ACCS; ECON
1. Provide free samples of medication	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2. Prescribe the cheapest equivalent medicine	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3. Not charge the patient (e.g. for co-payments)	<input type="checkbox"/> Yes <input type="checkbox"/> No		
36. In the past 12 months, how often have you noticed that patients delayed their visits for financial reasons?	<input type="checkbox"/> Frequently <input type="checkbox"/> Occasionally <input type="checkbox"/> Never	New	EQ; ACCS; ECON
37. If new patients enter your practice, do you receive their medical records from their previous doctor?	<input type="checkbox"/> Yes, always or usually <input type="checkbox"/> Only occasionally <input type="checkbox"/> Rarely or never	New	COOR; CONT
38. Which restrictions do you apply to accepting new patients? (More than one answer can be given)	<input type="checkbox"/> No restrictions (everyone is accepted) <input type="checkbox"/> No new patients are taken above a maximum number <input type="checkbox"/> No new patients are taken above a certain age <input type="checkbox"/> No new patients are taken outside my geographical working area <input type="checkbox"/> I use a wait period for new patients <input type="checkbox"/> Acceptance depends on patient's medical history <input type="checkbox"/> Acceptance depends on patient's insurance status	Question based on Ref. 28, Q1 Different wording and answering categories	EQ (AC)

39. Do you provide health care to people when you are not remunerated for this (for instance uninsured, illegal immigrants)?	<input type="checkbox"/> Yes, (almost) always <input type="checkbox"/> Yes, but only in urgent cases <input type="checkbox"/> Yes, sometimes <input type="checkbox"/> No <input type="checkbox"/> No such people show up in my practice <input type="checkbox"/> Not applicable (in this country such care is remunerated)	New but topic based on Ref. 13, Q other1	EQ (AC)
40. Do your medical files normally include the following information? (Tick all that apply)	<input type="checkbox"/> Living situation <input type="checkbox"/> Ethnicity <input type="checkbox"/> Patient's family history (e.g. depression, cancer) <input type="checkbox"/> Patient's weight and height <input type="checkbox"/> Smoking <input type="checkbox"/> Blood pressure <input type="checkbox"/> Reason for encounter <input type="checkbox"/> Diagnosis <input type="checkbox"/> Prescribed medications <input type="checkbox"/> Test results	New	CONT
41. How do you keep patient medical records? (tick all that apply)	<input type="checkbox"/> I keep records except for minor or trivial complaints <input type="checkbox"/> I only keep records of regularly attending patients <input type="checkbox"/> I keep records unless I am too busy <input type="checkbox"/> I keep records routinely of all patient contacts <input type="checkbox"/> Don't know	Ref. 27, Q28, wording slightly adjusted	CONT
42. In the past 2 years, have you used your medical record system to list a selection of patients on the basis of age, diagnosis or risk? (tick all that apply)	<input type="checkbox"/> No <input type="checkbox"/> Yes, by age (e.g. those above age 50) <input type="checkbox"/> Yes, by diagnosis or health risk (e.g. diabetes or hypertension) <input type="checkbox"/> Yes, by medications they take (e.g. patients on multiple medications) <input type="checkbox"/> Yes, to send reminders for prevention or follow-up	Based on Ref. 12, Q18, but with different answering categories and different wording	CONT
43. For which of the following purposes do you use a computer in your practice? (tick all that apply)	<input type="checkbox"/> Not applicable (I don't use a computer) <input type="checkbox"/> Making appointments <input type="checkbox"/> Issuing invoices <input type="checkbox"/> Issuing drug prescriptions <input type="checkbox"/> Keeping records of consultations <input type="checkbox"/> Sending referral letters to medical specialists <input type="checkbox"/> Storing diagnostic test results <input type="checkbox"/> Searching medical information on the Internet <input type="checkbox"/> Sending prescriptions to the pharmacy	Ref. 27, Q29, wording slightly adjusted	CONT; COOR

44. How often do you meet face to face with the following professionals (either professionally or socially)?	Seldom or never	Every 1–3 months	More than once a month	Combination of Ref. 10, Q1.20 and Ref. 27, Q41, extra disciplines added	COOR
1. Other GP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2. Practice nurse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3. Ambulatory medical specialist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4. Hospital medical specialist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5. Pharmacist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6. Home care nurse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
7. Midwife	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
8. Physiotherapist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
9. Social worker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
10. Dietitian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
45. How often do you ask for advice (e.g. by telephone) from the following medical specialists?	Seldom or never	Every 1–3 months	More than once a month	Ref. 27, Q42, extra disciplines added	COOR
1. Paediatrician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2. Internist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3. Gynaecologist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4. Surgeon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5. Neurologist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6. Dermatologist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
7. Geriatrician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
8. Psychiatrist/mental health professional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
9. Radiologist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
46. Does your practice nurse or assistant independently provide:	<input type="checkbox"/> Not applicable (no nurse in my practice)			New	COOR
1. Immunisation	<input type="checkbox"/> Yes <input type="checkbox"/> No				
2. Health promotion (e.g. giving lifestyle or smoking cessation advice)	<input type="checkbox"/> Yes <input type="checkbox"/> No				
3. Routine checks of chronically ill patients (e.g. those with diabetes)	<input type="checkbox"/> Yes <input type="checkbox"/> No				
4. Minor procedures (e.g. ear syringing, wound treatment)	<input type="checkbox"/> Yes <input type="checkbox"/> No				
47. To what extent do you use referral letters (including details on provisional diagnosis and possible test results) when you refer patients to a medical specialist?	I use letters: <input type="checkbox"/> for all patients that I refer <input type="checkbox"/> for most patients that I refer <input type="checkbox"/> for a minority of patients that I refer <input type="checkbox"/> seldom or never			Ref. 27, Q31, slightly different wording	COOR
48. To what extent do medical specialists inform you after they have finished the treatment or diagnostics of your patients?	<input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occasionally <input type="checkbox"/> Seldom or never			Ref. 27, Q32, wording changed	COOR
49. After a patient has been discharged, how long does it usually take to receive a (summary) discharge report from the hospital most frequented by him or her?	<input type="checkbox"/> 1–4 days <input type="checkbox"/> 5–14 days <input type="checkbox"/> 15–30 days <input type="checkbox"/> More than 30 days <input type="checkbox"/> I rarely or never receive a discharge report			Ref. 27, Q33, wording slightly changed	CONT; COOR

<p>50. For the following health problems, to what extent will patients in your practice population (people who normally apply to you for primary medical care) contact you as the first health care provider? (This is only about the first contact, not about further diagnosis or treatment.)</p>	<p>(Almost) always Usually Occa- Seldom/ always sionally never</p>	<p>Ref. 10, Q3 First contact, several items removed</p> <p>COMPR</p>
<p>1. Child with severe cough <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>2. Child aged 8 with hearing problem <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>3. Woman aged 18 asking for oral contraception <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>4. Man aged 24 with stomach pain <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>5. Man aged 45 with chest pain <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>6. Woman aged 50 with a lump in her breast <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>7. Woman aged 60 with deteriorating vision <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>8. Woman aged 60 with polyuria <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>9. Woman aged 60 with acute symptoms of paralysis/paresis <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>10. Man aged 70 with joint pain <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>11. Woman aged 75 with moderate memory problems <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>12. Man aged 35 with sprained ankle <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>13. Man aged 28 with a first convulsion <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>14. Anxious man aged 45 <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>15. Physically abused child aged 13 <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>16. Couple with relationship problems <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>17. Woman aged 50 with psychosocial problems <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>18. Man aged 32 with sexual problems <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>19. Man aged 52 with alcohol addiction problems <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p>	<p>(Almost) always Usually Occa- Seldom/ always sionally never</p>	<p>Ref. 10, Q5 Disease management, several items removed</p> <p>COMPR</p>
<p>51. To what extent are you involved in the treatment and follow-up of patients in your practice population with the following diagnoses ('practice population' means people who normally apply to you for primary medical care)?</p>	<p>(Almost) always Usually Occa- Seldom/ always sionally never</p>	<p>Ref. 10, Q5 Disease management, several items removed</p> <p>COMPR</p>
<p>1. Chronic bronchitis/COPD <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>2. Hordeolum (stye) <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>3. Peptic ulcer <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>4. Herniated disc lesion <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>5. Congestive heart failure <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>6. Pneumonia <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>7. Peritonsillar abscess <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>8. Parkinson's disease <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>9. Uncomplicated diabetes (type 2) <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>10. Rheumatoid arthritis <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>11. Depression <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p> <p>12. Myocardial infarction <input type="checkbox"/> (Almost) always <input type="checkbox"/> Usually <input type="checkbox"/> Occa- sionally <input type="checkbox"/> Seldom/ never <input type="checkbox"/></p>	<p>(Almost) always Usually Occa- Seldom/ always sionally never</p>	<p>Ref. 10, Q5 Disease management, several items removed</p> <p>COMPR</p>

52. To what extent are the following activities carried out in your practice population by you (or your staff) and not by a medical specialist? (Practice population means people normally applying to you for primary medical care.) For example, if fundoscopy is (almost) always done by you, tick that box.	(Almost) always	Usually	Occasionally	Seldom/ Never	Ref. 10, Q2, application of medical techniques, several items removed	COMPR
1. Wedge resection of ingrown toenail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2. Removal of sebaceous cyst from the hairy scalp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3. Wound suturing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4. Excision of warts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5. Insertion of IUD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6. Fundoscopy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
7. Joint injection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
8. Strapping an ankle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
9. Cryotherapy (for warts)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
10. Setting up an intravenous infusion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
53. When do you, or your staff, measure blood pressure? (more than one answer can be given)	<input type="checkbox"/> In connection with relevant clinical conditions <input type="checkbox"/> On request <input type="checkbox"/> Routinely in office contacts with adults (regardless of the reason for visit) <input type="checkbox"/> In adults invited for this purpose				Ref. 10, Q4.1, slightly changed	COMPR
54. When do you, or your staff, measure blood cholesterol level? (more than one answer can be given)	<input type="checkbox"/> In connection with relevant clinical conditions <input type="checkbox"/> On request <input type="checkbox"/> Routinely in office contacts with adults (regardless of the reason for visit) <input type="checkbox"/> In adults invited for this purpose <input type="checkbox"/> No such measures				Ref. 10, Q4.2, slightly changed	COMPR
55. To what extent are you involved in health education on the following topics? (more than one answer can be given)	Not involved	In connection with normal patient contacts	In group sessions or special programmes		Ref. 10, Q4.5, item 4 added and wording slightly changed	COMPR
1. Smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2. Diet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
3. Problematic use of alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
4. Physical exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
56. Are you or your practice staff involved in the following activities?	Involved	Not involved			Ref. 10, Q4.6, activities removed and two added	COMPR
1. Routine antenatal care	<input type="checkbox"/>	<input type="checkbox"/>				
2. Immunisation of children (as part of a programme)	<input type="checkbox"/>	<input type="checkbox"/>				
3. Paediatric surveillance of children under 4 years	<input type="checkbox"/>	<input type="checkbox"/>				
4. Influenza vaccination (as part of a programme)	<input type="checkbox"/>	<input type="checkbox"/>				
5. Palliative care	<input type="checkbox"/>	<input type="checkbox"/>				

57. During the past 12 months, have you offered special session(s) or clinics for the following groups?	Yes	No				Ref. 27, Q23, wordings and answer categories changed	COMPR
1. Diabetic patients	<input type="checkbox"/>	<input type="checkbox"/>					
2. Hypertensive patients	<input type="checkbox"/>	<input type="checkbox"/>					
3. Pregnant women	<input type="checkbox"/>	<input type="checkbox"/>					
4. Elderly	<input type="checkbox"/>	<input type="checkbox"/>					
58. If you were confronted through your patient contacts with the following occurrences, would you report this (for instance to an authority)?	Yes	Probably yes	Probably not	No	Don't know		New, community responsibility
1. Repeated accidents in an industrial setting	<input type="checkbox"/>						
2. Frequent respiratory problems in patients living near a certain industry	<input type="checkbox"/>						
3. Repeated cases of food poisoning among people living in a certain district	<input type="checkbox"/>						
59. In the past 12 months, about how many weeks altogether have you been away from the practice due to:						Ref. 29, Q13b, different wordings, categories	EFF
1. Attending conferences or other educational activities		___ weeks					
2. Research activities		___ weeks					
3. Vacations		___ weeks					
4. Illness		___ weeks					
60. To what extent do you agree with the following statements?	Strongly agree	Agree	Disagree	Strongly disagree		Ref. 10, Q6, job satisfaction, slightly changed	WORK
1. I feel that some parts of my work do not really make sense	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2. My work still interests me as much as it ever did	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
3. My work is overloaded with unnecessary administrative detail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
4. I have too much stress in my current job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
5. Being a GP is a well-respected job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
6. In my work there is a good balance between effort and reward	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

BACK, background; PRACC, practice characteristics; ECON, economic conditions; WORK, workforce; ACCS, accessibility; CONT, continuity; COOR, coordination; COMP, comprehensiveness; EFF, efficiency; EQ (AC) and (TR), equity in access and treatment.

Appendix B : QUALICOPC questionnaire for patients (Experiences)

Question	Response categories	Source(s)	Theme(s)
1. How would you describe your own health in general?	<input type="checkbox"/> Very good <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	Ref. 30, wording changed	BACK
2. Do you have a longstanding disease or condition such as high blood pressure, diabetes, depression, asthma or another longstanding condition?	<input type="checkbox"/> Yes <input type="checkbox"/> No	New	BACK
3. Do you have your own doctor (for instance a GP) whom you normally consult first with a health problem?	<input type="checkbox"/> Yes, the doctor I just visited <input type="checkbox"/> Yes, but another doctor in this practice or centre <input type="checkbox"/> Yes, but another doctor from somewhere else <input type="checkbox"/> No, I do not have my own doctor	New, but topic derived from Ref. 16, Q507	BACK
4. In the last 6 months, how often have you visited or consulted a GP (this GP or another one)?	<input type="checkbox"/> This was the first time in the past 6 months <input type="checkbox"/> Once before this visit <input type="checkbox"/> 2 to 4 times before this visit <input type="checkbox"/> 5 times or more before this visit <input type="checkbox"/> Don't know	Ref. 31, Q3; Ref. 14, Q2; Ref. 16, Q500	BACK
5. What was the main reason for your visit to this GP today? (More than one answer can be given)	<input type="checkbox"/> Because you were ill or didn't feel well <input type="checkbox"/> For a medical check-up <input type="checkbox"/> To get a repeat prescription <input type="checkbox"/> To get a referral <input type="checkbox"/> To get a medical certificate <input type="checkbox"/> For a second opinion <input type="checkbox"/> Other reason	Topic derived from Ref. 32, Q4 (very different wording)	BACK
6. Think about the consultation that you just finished. Do you agree with the following?	Yes No	Ref. 27, Q22	CONT
6.1. The doctor had my medical records at hand	<input type="checkbox"/> <input type="checkbox"/>		
6.2. The doctor was polite	<input type="checkbox"/> <input type="checkbox"/>	New	QUAL
6.3. The doctor listened carefully to me	<input type="checkbox"/> <input type="checkbox"/>	Ref. 31, Q10; Ref. 15, Q5(topic)	QUAL
6.4. The doctor hardly looked at me when we talked	<input type="checkbox"/> <input type="checkbox"/>	Ref. 33, Q3 (topic)	QUAL
6.5. The doctor asked questions about my health problem	<input type="checkbox"/> <input type="checkbox"/>	New	QUAL
6.6. I couldn't really understand what the doctor was trying to explain	<input type="checkbox"/> <input type="checkbox"/>	Ref. 34, Q14; Ref. 17, Q14; Ref. 31, Q9 (topic); Ref. 14, Q30; Ref. 27, Q22; Ref. 21, QD3 (topic)	QUAL

6.7. The doctor took sufficient time	<input type="checkbox"/>	<input type="checkbox"/>		Ref. 14, Q42; Ref. 15, Q1; Ref. 14, Q32	ACCS
6.8. The doctor involved me in making decisions about treatment	<input type="checkbox"/>	<input type="checkbox"/>		Ref. 15, Q4; Ref. 35, Q10d; Ref. 14, Q66	AUTN QUAL
6.9. I would recommend this doctor to a friend or relative	<input type="checkbox"/>	<input type="checkbox"/>		Ref. 21, QK2	QUAL
6.10. The doctor asked about possible other problems besides the one I just came for	<input type="checkbox"/>	<input type="checkbox"/>		New	QUAL
7. If you were to need an interpreter to help you speak with a doctor in this practice, is such a service available?	<input type="checkbox"/> I never need an interpreter <input type="checkbox"/> Yes, it is always available <input type="checkbox"/> Yes, it is usually available <input type="checkbox"/> No, it is insufficiently or not available <input type="checkbox"/> Don't know			Ref. 17, Q57	EQ (AC)
8. Think about the doctor you visited today. Do you agree with the following?	Yes	No	Don't know	Ref. 31, Q12; Ref. 34, Q18	CONT
8.1. He/she knows important information about my medical background	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
8.2. He/ she knows about my living situation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 27, Q22	CONT
8.3. This doctor doesn't just deal with medical problems but can also help with personal problems and worries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 15, Q2 ; Ref. 36, ; Ref. 14, Q25	QUAL
8.4. After this visit, I feel I can cope better with my health problem/illness than before	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 37, (topic)	QUAL
9. In the past 12 months, has a GP from this practice talked to you about how to stay healthy? (for instance about diet, alcohol or smoking)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know			Ref. 14;21, QH1 Ref. 14, Q40	COMPR
10. In the past 2 years, has a GP from this practice ever asked you about all the medications you take (also those prescribed by other doctors)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know			Ref. 18, Q625	CONT
11. Think about the practice that you visited today. Do you agree with the following?	Yes	No	Don't know		
11.1. The opening hours are too restricted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 27, Q20	ACCS
11.2. If I need a home visit I can get one	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 27, Q22	ACCS
11.3. The practice is too far away from where I am living or working	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 33, Q33	ACCS
11.4. When I called this practice, I had to wait too long to speak to someone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 14, Q5	ACCS
11.5. I know how to get evening, night and weekend services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 27, Q20	ACCS
11.6. People were polite and helpful at the reception desk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 34, Q24	QUAL
12. How long does it usually take you to travel from your home to this practice?	<input type="checkbox"/> Less than 20 minutes <input type="checkbox"/> 20–40 minutes <input type="checkbox"/> 40–60 minutes <input type="checkbox"/> More than 1 hour <input type="checkbox"/> Don't know			Ref. 27, Q19	ACCS

13. Did you make an appointment for this visit to your doctor?	<input type="checkbox"/> Yes <input type="checkbox"/> No → Go to Question 16	Ref. 27 (topic)	ACCS
14. Was it easy to get the appointment?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Ref. 21, QC8 (topic)	ACCS
15. How many days did you wait for this visit?	<input type="checkbox"/> I made the appointment earlier today <input type="checkbox"/> I made the appointment yesterday <input type="checkbox"/> I waited 2–7 days <input type="checkbox"/> I waited more than a week <input type="checkbox"/> Don't know	Ref. 27, Q23	ACCS
16. How long did you wait today between arriving in the practice and the consultation?	<input type="checkbox"/> Less than 15 minutes <input type="checkbox"/> 15–30 minutes <input type="checkbox"/> 30–45 minutes <input type="checkbox"/> 45–60 minutes <input type="checkbox"/> More than an hour <input type="checkbox"/> Don't know	Ref. 27, Q26; Ref. 21, QC9 (topic)	ACCS
17. Do you think it is too difficult to see a GP during evenings, nights and weekends?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	Ref. 18, Q510	ACCS
18. In the past 12 months, has one of the following happened to you in this practice?	Yes No Don't know		
18.1. The doctor or staff acted negatively to you	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Ref. 19, Q41.2	EQ (TR)
18.2. Other patients were treated better than you	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Ref. 19, Q41.4	EQ (TR)
18.3. The doctor was too much concerned about money	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Ref. 19, Q41.11	EQ (TR)
18.4. The doctor or staff showed disrespect because of your ethnic background	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Ref. 19, Q40; Ref. 17, Q33c	EQ (TR)
18.5. The doctor or staff showed disrespect because of your gender	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Ref. 19, Q40	EQ (TR)
19. In the past 12 months, have you ever had the following experiences <u>in this practice</u> ?	Yes No Don't know		
19.1. I thought tests or examinations were repeated unnecessarily	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Ref. 38, Q5	COOR
19.2. I thought I got the wrong medication or wrong dose	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Ref. 16–18,	QUAL
19.3. I thought I got incorrect results of a test or X-ray	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Ref. 17, Q38a rephrased	QUAL
20. If you are unhappy with the treatment you received, do you think this doctor would be prepared to discuss it with you?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	Ref. 14, Q45 rephrased	QUAL
21. In the past 12 months, did you postpone or abstain from a visit to this doctor or another GP when you needed one?	<input type="checkbox"/> Yes <input type="checkbox"/> No → Go to Question 23	Ref. 19, Q10 rephrased	EQ (AC)
22. What was the most important reason why you did not visit a GP? (more than one answer can be given)	<input type="checkbox"/> I did not have insurance <input type="checkbox"/> Other financial reasons <input type="checkbox"/> I could not get there (physically) <input type="checkbox"/> I was too busy <input type="checkbox"/> Other reason	Ref. 19, Q11 rephrased and items added	EQ (AC)

23. How many times in the past 12 months have you consulted a medical specialist for yourself?	<input type="checkbox"/> None <input type="checkbox"/> Once or twice <input type="checkbox"/> 3 to 5 times <input type="checkbox"/> 6 to 10 times <input type="checkbox"/> More than 10 times				New	BACK
24. Do you agree with the following statements?	Yes	No	Don't know	Not applicable		
24.1. If I visit another GP besides my own GP, he/she has the necessary information about me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 27, Q25 rephrased	COOR/CONT
24.2. When I am referred, my GP informs the medical specialist about my illness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 27, Q25 rephrased	COOR
24.3. When I am referred, my GP decides to whom I should go	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	New	AUTN
24.4. After treatment by a medical specialist, my GP knows the results	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ref. 27, Q25 rephrased	COOR/CONT
24.5. It is difficult to get a referral to a medical specialist from my GP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	New	COOR/ACCS
25. In the last 12 months, how often did you visit a hospital emergency department for yourself?	<input type="checkbox"/> Never → Go to Question 27 <input type="checkbox"/> 1 time <input type="checkbox"/> 2 or 3 times <input type="checkbox"/> 4 or more times				Ref. 18, Q750 Topic	BACK
26. Why did you go to the emergency department instead of going to a GP? (more than one answer can be given)	<input type="checkbox"/> I had something GPs do not treat <input type="checkbox"/> There was no GP available <input type="checkbox"/> For financial reasons <input type="checkbox"/> At the emergency department I expected a shorter waiting time <input type="checkbox"/> The emergency department provides better care <input type="checkbox"/> The emergency department is more convenient to reach <input type="checkbox"/> Other reason(s)				Ref. 18, Q750 Topic	ACCS
27. In the past 12 months, have you been examined or treated by a nurse at your GP's practice?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				Ref. 39, QD1 rephrased	COOR
28. Would most people visit a GP for the following?	Yes	Probably yes	Probably not	No	Don't know	Ref. 21, Reprashed, different items
28.1. Cut finger that needs to be stitched	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.2. Removal of a wart	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.3. Routine health checks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.4. Deteriorated vision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.5. Help to quit smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.6. A child with a severe cough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.7. Stomach pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.8. Blood in the stool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.9. Sprained ankle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.10. Anxiety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.11. Domestic violence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.12. Sexual problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.13. Relationship problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28.14. Advice for choosing the best hospital or specialist for a certain treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Extremely important	Rather important	Somewhat important	Not important	Ref. 40,	AHOSP
29. How important would it be for you to see a doctor if you had:						
29.1. Weight loss of more than 2 kilograms in a month when not dieting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
29.2. Shortness of breath with light exercise or light work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
29.3. Chest pain when exercising	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
29.4. Loss of consciousness, fainting or passing out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
29.5. Headache for more than one day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
29.6. Abdominal pain for more than one day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
29.7. Severe worries for more than a month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
30. Would you expect to benefit from a GP visit for:	Yes	No	Don't know		Ref. 41	AHOSP
30.1. Stomach problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
30.2. Shoulder and neck pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
30.3. Feeling nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
30.4. Diarrhoea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
30.5. Sore throat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
30.6. Headache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
30.7. Feeling tired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
30.8. Flu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
30.9. Feeling nauseous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
31. Do you agree with the following statements?	Strongly agree	Agree	Disagree	Strongly disagree	New	BACK
1. In general, doctors can be trusted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2. In general, people can be trusted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Finally, we would like to ask you some questions about your personal background</i>						
32. Are you male or female?	<input type="checkbox"/> Male <input type="checkbox"/> Female				New	BACK
33. What is your year of birth? Please fill in:	Year of birth: 19__				New	BACK
34. Where were you born?	<input type="checkbox"/> In this country <input type="checkbox"/> In another EU country <input type="checkbox"/> In a European country outside the EU <input type="checkbox"/> In North America, Australia or New Zealand <input type="checkbox"/> In another country				New	BACK
35. Where was your mother born?	<input type="checkbox"/> In this country <input type="checkbox"/> In another EU country <input type="checkbox"/> In a European country outside the EU <input type="checkbox"/> In North America, Australia or New Zealand <input type="checkbox"/> In another country				New	BACK
36. Are there other adults in your household (including children older than 18)?	<input type="checkbox"/> Yes <input type="checkbox"/> No				New	BACK

37. Are there any children (under 18) in your household?	<input type="checkbox"/> Yes <input type="checkbox"/> No	New	BACK
38. How would you describe your current occupation or employment status? (more than one answer can be given)	<input type="checkbox"/> Employed (including civil service) <input type="checkbox"/> Self-employed or family business <input type="checkbox"/> Student <input type="checkbox"/> Looking for a job (unemployed) <input type="checkbox"/> Unable to work due to illness or disability <input type="checkbox"/> Retired <input type="checkbox"/> Mainly homemaker (including looking after children, etc.)	New	BACK
39. What is the highest level of education that you achieved?	<input type="checkbox"/> No qualifications/pre-primary education or primary education or lower secondary education <input type="checkbox"/> Upper secondary education <input type="checkbox"/> Post-secondary, non-tertiary education or higher	Ref. 42	BACK
40. How well do you speak an official language of this country [fill in language(s)]?	<input type="checkbox"/> Fluently/native speaker level <input type="checkbox"/> Sufficiently <input type="checkbox"/> Moderately <input type="checkbox"/> Poorly <input type="checkbox"/> Not at all	New	BACK
41. Compared with the average in this country, would you say your household's income is:	<input type="checkbox"/> Below average <input type="checkbox"/> Around average <input type="checkbox"/> Above average	Ref. 20, Q140,	BACK rephrased and less categories

BACK, background; ACCS, accessibility; CONT, continuity; COOR, coordination; COMP, comprehensiveness; QUAL, quality; EQ (AC) and (TR), equity in access and treatment; AUTN, patient autonomy; AHOSP, avoidable hospitalisation.

Appendix C : Patient Values Questionnaire

Question	Response categories				Source(s)	Theme(s)
1. How would you describe your own health in general?	<input type="checkbox"/> Very good <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor				Ref. 30, wording changed	BACK
2. Do you have a longstanding disease or condition such as high blood pressure, diabetes, depression, asthma or another longstanding condition?	<input type="checkbox"/> Yes <input type="checkbox"/> No				New	BACK
3. How important are the following to you?	Not important	Somewhat important	Important	Very important	<i>Weiging Patient Experiences</i>	
1. That this doctor has my medical records at hand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.1	CONT
2. That this doctor is polite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.2	QUAL
3. That this doctor asks questions about my health problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.5	QUAL
4. That I understand clearly what this doctor explains	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.6	QUAL
5. That this doctor involves me in making decisions about treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.8	AUTN
6. That this doctor asks about possible other problems besides the one I came for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.10	QUAL
7. That people at the reception desk are polite and helpful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.6	QUAL
4. How important are the following to you?	Not important	Somewhat important	Important	Very important	<i>Weiging Patient Experiences</i>	
1. That this doctor knows important information about my medical background	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.1	CONT
2. That this doctor knows about my living situation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.2	CONT
3. That I feel able to cope better with my health problem/illness after this visit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.4	QUAL
5. How important are the following to you?	Not important	Somewhat important	Important	Very important	<i>Weiging Patient Experiences</i>	
1. That this practice has extensive opening hours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.1	ACCS
2. That I can get an appointment easily at this practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13	ACCS
3. That I know how to get evening, night and weekend services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.5	ACCS
4. That this practice is close to where I live or work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12	ACCS
5. That I have a short waiting time on the phone when I call this practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.4	ACCS

6. How important are the following to you?	Not important	Somewhat important	Important	Very important	Ref. 23	QUAL
Before the consultation with your GP						
1. That I don't need to tell a receptionist or nurse about details of my health problem before seeing my doctor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2. That the doctor has prepared for the consultation by reading my medical notes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3. That I have prepared for the consultation by keeping a symptom diary or preparing questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4. That I can bring a family member/friend to the consultation if I think this is useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5. That I know which doctor I will see	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6. That I keep to my appointment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
7. From the above-mentioned 6 items, which one do you find the most important one?	Most important is item number: ___ (fill in)					
7. How important are the following to you?	Not important	Somewhat important	Important	Very important	Ref. 23	QUAL
During the consultation with your GP						
1. That the doctor makes me feel welcome by making eye contact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2. That the doctor listens attentively	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3. That the doctor does not make me feel under time pressure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4. That the doctor is aware of my personal, social and cultural background	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5. That the doctor is not prejudiced because of my age, gender, religion or cultural background	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6. That the doctor treats me as a person and not just as a medical problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
7. That the doctor is respectful during physical examination and by not interrupting me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
8. That the doctor takes me seriously	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
9. That the doctor understands me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
10. That the doctor asks me if I have any questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
11. That the doctor asks if I have understood everything	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
12. That the doctor knows when to refer me to a medical specialist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
13. That the doctor asks how I prefer to be treated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
14. From the above-mentioned 13 items, which one do you find the most important one?	Most important is item number: ___ (fill in)					

8. How important are the following to you? During the consultation with your GP	Not important	Somewhat important	Important	Very important	Ref. 23	QUAL
1. That the doctor avoids disturbances of the consultation by telephone calls, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2. That the doctor gives me additional information about my health problem, e.g. leaflets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3. That the doctor informs me about reliable sources of information, e.g. websites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4. That I tell the doctor what I want to discuss in this consultation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5. That I am prepared to ask questions and take notes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6. That I am honest and do not feel embarrassed to talk about my health problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
7. That I am open about my use of other treatments, such as self-medication or alternative medicine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
8. That psychosocial issues (e.g. personal worries) can be discussed if needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
9. From the above-mentioned 8 items, which one do you find the most important one?	Most important is item number: ___ (fill in)					
9. How important are the following to you? After the consultation with your GP	Not important	Somewhat important	Important	Very important	Ref. 23	QUAL
1. That the doctor gives me all the test results, even if they show no abnormalities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2. That the doctor offers me telephone or email contact if I have further questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3. That the doctor gives me clear instructions on what to do when things go wrong	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4. That I adhere to the agreed treatment plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5. That I inform the doctor how the treatment works out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6. That I can see another doctor if I think it is necessary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
7. From the above-mentioned 6 items, which one do you find the most important one?	Most important is item number: ___ (fill in)					

Finally, we would like to ask you some questions about your personal background

10. Are you male or female?	<input type="checkbox"/> Male <input type="checkbox"/> Female	New	BACK
11. What is your year of birth? Please fill in:	Year of birth: 19__	New	BACK
12. Where were you born?	<input type="checkbox"/> In this country <input type="checkbox"/> In another EU country <input type="checkbox"/> In a European country outside the EU <input type="checkbox"/> In North America, Australia or New Zealand <input type="checkbox"/> In another country	New	BACK
13. Where was your mother born?	<input type="checkbox"/> In this country <input type="checkbox"/> In another EU country <input type="checkbox"/> In a European country outside the EU <input type="checkbox"/> In North America, Australia or New Zealand <input type="checkbox"/> In another country	New	BACK
14. Are there other adults in your household (including children older than 18)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	New	BACK
15. Are there any children (under 18) in your household?	<input type="checkbox"/> Yes <input type="checkbox"/> No	New	BACK
16. How would you describe your current occupation or employment status? (more than one answer can be given)	<input type="checkbox"/> Employed (including civil service) <input type="checkbox"/> Self-employed or family business <input type="checkbox"/> Student <input type="checkbox"/> Looking for a job (unemployed) <input type="checkbox"/> Unable to work due to illness or disability <input type="checkbox"/> Retired <input type="checkbox"/> Mainly homemaker (including looking after children, etc.)	New	BACK
17. What is the highest level of education that you achieved?	<input type="checkbox"/> No qualifications obtained/pre-primary education or primary education or lower secondary education <input type="checkbox"/> Upper secondary level of education <input type="checkbox"/> Post-secondary, non-tertiary education or higher	Ref. 42	BACK
18. How well do you speak an official language of this country [fill in language(s)]?	<input type="checkbox"/> Fluently/native speaker level <input type="checkbox"/> Sufficiently <input type="checkbox"/> Moderately <input type="checkbox"/> Poorly <input type="checkbox"/> Not at all	New	BACK
19. Compared with the average income in this country, would you say your household's income is:	<input type="checkbox"/> Below average <input type="checkbox"/> Around average <input type="checkbox"/> Above average	Ref. 20, Q140,	BACK rephrased and fewer categories

BACK, background; ACCS, accessibility; CONT, continuity; COOR, coordination; COMP, comprehensiveness; QUAL, quality; EQ (AC) and (TR), equity in access and treatment; AUTN, patient autonomy.

Appendix D: Practice questionnaire

Question	Response categories	Source(s)	Theme(s)
1. Total number of patients <u>asked</u> to participate	___ patients	New	Response rate
2. Number of patients who have participated	___ patients	New	Response rate
3. Opening hours are clearly indicated outside	<input type="checkbox"/> Yes <input type="checkbox"/> No	Ref. 24	ACCS
4. Outside it is clearly indicated how to get out-of-hours care	<input type="checkbox"/> Yes <input type="checkbox"/> No	Ref. 24	ACCS
5. The practice has parking space for disabled people	<input type="checkbox"/> Yes <input type="checkbox"/> No	Ref. 24	EQ (AC)
6. Is the practice on the ground floor?	<input type="checkbox"/> Yes → continue to Question 8 <input type="checkbox"/> No	Ref. 24	BACK
7. Is an elevator available for patients?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Ref. 24	EQ (AC)
8. How accessible is the practice for patients using a wheelchair or stroller?	<input type="checkbox"/> Very easy <input type="checkbox"/> Easy <input type="checkbox"/> Difficult <input type="checkbox"/> Impossible to access	Ref. 24	EQ (AC)
9. Is a toilet available for patients with a disability?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Ref. 24	EQ (AC)
10. How clean does the waiting room look?	<input type="checkbox"/> Very clean <input type="checkbox"/> Fairly clean <input type="checkbox"/> Not clean	Ref. 24	QUAL
11. Can people in the waiting room hear what is being said at the reception desk?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable (no reception desk)	New	QUAL
12. Can people in the waiting room hear or see what happens in the doctor's office?	<input type="checkbox"/> Yes <input type="checkbox"/> No	New	QUAL

BACK, background; ACCS, accessibility; QUAL, quality; EQ (AC) and (TR), equity in access and treatment.

4

Two decades of change in European general practice service profiles: conditions associated with the developments in 28 countries between 1993 and 2012

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Abstract

Objective

Evidence regarding the benefits of strong primary care has influenced health policy and practice. This study focuses on changes in the breadth of services provided by general practitioners (GPs) in Europe between 1993 and 2012 and offers possible explanations for these changes.

Design

Data on the breadth of service profiles were used from two cross-sectional surveys in 28 countries: the 1993 European GP Task Profile study (6321 GPs) and the 2012 QUALICOPC study (6044 GPs). GPs' involvement in four areas of clinical activity (first contact care, treatment of diseases, medical procedures, and prevention) was established using econometric analyses. The changes were measured by the relative increase in the breadth of service profiles. Associations between changes and national-level conditions were examined through regression analyses. Data on the national conditions were used from various other public databases including the World Databank and the PHAMEU (Primary Health care Activity Monitor) database.

Setting

A total of 28 European countries.

Subjects

GPs.

Main outcome measure

Changes in the breadth of GP service profiles.

Results

A general trend of increased involvement of European GPs in treatment of diseases and decreased involvement in preventive activities was observed. Conditions at the national level were associated with changes in the involvement of GPs in first contact care, treatment of diseases and, to a limited extent, prevention. Especially in countries with stronger growth of health care expenditures between 1993 and 2012 the service

profiles have expanded. In countries where family values are more dominant the breadth in service profiles decreased. A stronger professional status of GPs was positively associated with the change in first contact care.

Conclusions

GPs in former communist countries and Turkey have increased their involvement in the provision of services. Developments in Western Europe were less evident. The developments in the service profiles could only to a very limited extent be explained by national conditions. A main driver of reform seems to be the changes in health care expenditure, which may indicate a notion of urgency because there may be a pressure to curb the rising expenditures.

Key points

- Broad GP service profiles are an indicator of strong primary care in a country. It is expected that developments in the breadth of GP service profiles are influenced by various national conditions related to the urgency to reform, politics, and means.
- Between 1993 and 2012 the involvement of GPs in European countries in treatment of diseases increased and their involvement preventive activities decreased.
- The national conditions were found to be associated with changes in GPs' involvement as first contact of care, treatment of diseases, and, to a limited extent, prevention.
- More specifically, in countries with a stronger growth in health care expenditures, service profiles of European GPs have expanded more in the past decades.

Introduction

Societal developments and changing health needs have influenced health care and general practice in European countries during the past two decades. Some health care systems have undergone fundamental changes. In the early 1990s, health status and life expectancy in the post-

communist countries (hereafter: transitional countries) was very poor and the health care systems were unable to respond effectively [1–3]. Most of these countries chose drastic health sector reforms by introducing primary care with a central role for general practitioners (GPs) coupled with a gradual reduction of the extensive hospital sector [4–6]. They mainly took social insurance systems as examples [1]. In other European countries, rising health expenditures and the increasing complexity of health care needs required adaptations to health care systems. Based on evidence, the solution to these challenges was sought partly in strengthening primary care, in particular general practice [5]. General practice was expected to increase the efficiency and responsiveness of health care systems when serving as the entry to the system, the focal point for coordination, and dealing with most health problems [7–10]. However, the feasibility and practical implementation of the principles to strengthen and maintain strong primary care varied between countries, as health care systems differed [4,5,11,12]. The extent to which strengthening primary care has been adopted as a solution to the challenges is expected to be visible in the service profiles of GPs. These profiles consist of the range of curative and preventive activities plus the first contact care for their patients [10,13,14]. First contact care concerns the services that address problems for which people will first consult their GP instead of doctors in secondary or hospital care. A broad service package provided by GPs determines the strength of primary care, as a comprehensive service package within primary care indicates a stronger process quality [10]. While stronger primary care could be seen as a common solution, countries have responded differently to challenges and developments. Reasons for this must not only be sought in the variation in health care systems, but also in the different social and political contexts. Implementation of measures to strengthen primary care depends on the “will” and the “means” to address problems [15,16]. The greater the urgency of a problem, the greater the political will to put it on the policy agenda [15,17]. For example, the decrease in life expectancy in the transitional countries just after the fall of communism created an urgency to put a complete health care system reform on the agenda. The increasing costs of health care in Western countries also created an urgency to counteract these increases by, for example, strengthening primary care. The will to address a

problem is also likely to be influenced by politics through, for instance, the political composition of governments [15]. Strong primary care does not just emerge spontaneously, but requires an interventionist policy [18]. Left-wing governments favour greater state intervention than right-wing and liberal governments [15].

Furthermore, the means of a country determines its ability to implement a policy successfully. For example, a government that functions more effectively will be better able to implement a health policy.[15,17] In a more centralized health care system, the government may also be able to steer, more effectively, health care providers towards stronger primary care. A stronger professional status, consisting of, for example, the creation of an association and the establishment of specialized education, is expected to influence GP service profiles positively. In these countries, the tools are provided to offer services, e.g. through education. Given the above, we pose three questions related to the developments between 1993 and 2012 in 28 European countries:

1. How has the role of GPs as the doctor of first contact developed?
2. How has the breadth of the curative and preventive GP service profiles developed?
3. What conditions, related to the urgency to reform, the political situation, and the means of a country, are associated with the changes in the breadth of GP service profiles?

Material and methods

Data, based on cross-sectional questionnaire surveys among GPs from 28 countries, are derived from the 1993 European Task Profile study (n=6321 participating GPs) [14] and the 2012 QUALICOPC study (n=6044 GPs) [19,20]. The countries include: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and the UK. In each country the aim was to reach a representative sample of GPs. Details of the sampling procedures are described elsewhere for 1993 [21] and 2012 [19,22]. The questions in the

1993 survey on GP service profiles were repeated in 2012 with the purpose of comparing general practice between the two time points. As question and answering categories were copied either literally or only revised slightly without changing the meaning, the data can be compared.

Breadth of GP service profiles

The questionnaires measured GPs' activities related to: (1) their role in first contact care; (2) the management and follow-up of a range of acute and chronic conditions; that is, treatment of diseases; (3) minor medical technical procedures; and (4) preventive care. For each of the first three areas, a number of topics were presented and GPs were asked to fill in their involvement on a four-point scale ranging from "never" (1 point), to "almost always or always" (4 points) [14,20]. For example, GPs were asked to state to what extent they are involved in the treatment and follow-up of patients with a herniated intervertebral disc lesion and whether an anxious man aged 45 would contact him or her as the first health care provider (for a complete overview of the items included see Appendix 1). Regarding preventive activities, GPs were asked a set of questions related to their systematic involvement in blood pressure and cholesterol measurement and health education (Yes/No). Scale scores for the breadth of service profiles in the four areas were calculated using econometric analyses (latent multilevel variable analysis). Details of this approach are presented in Appendix 2. The scores were adjusted for various individual GP and GP practice characteristics and the variance at the GP practice level was taken out. The change between 1993 and 2012 was measured through calculating the relative increase in the breadth of the service profiles compared with 1993. The results of the scale construction are presented in Appendix 2.

Independent variables influencing the breadth of GP service profiles

The independent variables include indicators related to the urgency of reform, politics, and means. Box 1 outlines these indicators and how they are measured. In the analyses we adjusted for the breadth of the service profiles in 1993. This was because it is expected that the countries with a lower starting point in 1993 have more room for change. We also adjusted for the relative growth in GDP per capita between 1993 and 2012 in order

to take into account the differences in wealth between countries. Data on GDP per capita in Purchasing Power Parities (constant 2005 international \$) were derived from the World Data Bank [23]. Appendix 3 provides an overview of the values of all dependent variables.

Box 1 Operationalization of independent variables

The urgency of reform is measured by four indicators:

- a) The decrease in the life expectancy at the beginning of the 1990s, measured as the relative decrease in life expectancy between 1990 and 1995 (average, per year) (source: World Data Bank [23]).
- b) The increase in health care expenditure, measured as the increase in percentage of Gross Domestic Product (GDP) between 1995 and 2012 (source: World Data Bank [23]).
- c) The increase in demand for health care as a consequence of the ageing population, measured as the increase in the percentage of the population over 65 years old between 1993 and 2012 as this is an indicator for an ageing population (source: World Data Bank [23]).
- d) The willingness of a country's population to deliver informal care, measured as the percentage of the population preferring offspring to take care of an elderly father or mother in need of help (Source: TNS Opinion & Social & TNS, 2007 [24]).

With regard to politics, we looked at the political composition of governments, measured as the weighted number of years social-democrats or socialists were in power in the period from 1993-2010 (source: Armingeon et al, Comparative Political Data Set III 1990-2010 [25]).

The means of a country is measured by the indicators:

- a) Government effectiveness, measured as a standardized score, which is made up from, for example, the professionalism of the civil service and the absence of corruption. The mean of the scores between 1996 and 2011 is used (source: The Quality of Government Dataset [26]).
- b) The degree of centralization of the health care system, measured as the level of responsibility for the distribution of money in the health care system.

– Box 1 to be continued –

Countries where the distribution of money is the responsibility of the central government received a score of 1 and countries where this responsibility lies with multiple parties, such as insurance companies or local regions, received a score of 0 (sources: Various health care systems in Transition Profiles, European Observatory on health systems and policies).

- c) The strength of professional status of GPs, measured as a composite score of the strength of the academic status.

This includes: The percentage of either medical universities or universities with a medical faculty with a postgraduate programme in family medicine; family medicine as a subject in the undergraduate medical curriculum; the presence of national associations or colleges of GPs; and the availability of a journal on family medicine or general practice. Each of these indicators received a score from 1 to 3 and the average value was calculated as an indicator for the professional development of general practice in each country (source: PHAMEU database [27]).

Statistical analyses

Descriptive figures are provided on the changes in the independent variables. The variance between and within countries is analysed using multilevel modelling. The associations between the independent and dependent variables were analysed using linear regression analyses. Independent variables have been added one by one due to the low number of observations (28 countries). Regression coefficients were standardized by transforming all values into betas. Betas above 0.3 are considered to be high, between 0.25 and 0.3 moderately high, and below 0.25 low. Significance largely depends on the number of observations and is therefore less useful in international comparative research. Beta values around 0.30 correspond to $p=0.1$. One-tailed p-values were used ($p_{0.1}$). In 1993, GPs in many of the Eastern European countries were at the starting point of developing their service profiles, whereas GPs in many Western European countries already had more developed service profiles. To account for this, in each model the breadth of the service profiles in 1993 was included.

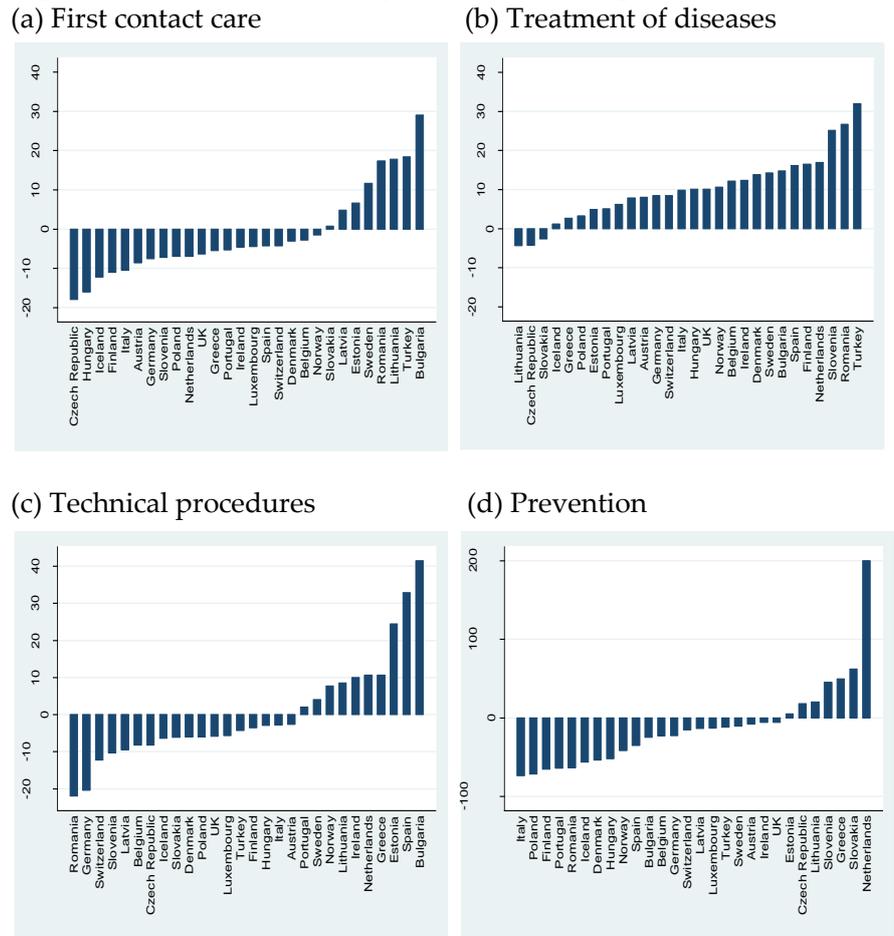
Besides, all models were repeated including the relative growth in GDP per capita. The multicollinearity between these and the other variables was tested through calculating inflation factors (VIF). This was done to avoid the correlations between the independent variables that were used in the same models being too high. All VIF values were below 3, indicating that the variables did not interfere with each other. Analyses were performed in Stata version 13.0™ (StataCorp LP, College Station, TX, USA) and MLWin version 2.29 (<http://www.bristol.ac.uk/cmm/software/mlwin/>).

Results

Changes in the breadth of GP service profiles

The changes in the breadth of the GP service profiles between 1993 and 2012 are presented in Figure 1(a–d) (detailed figures can be found in Appendix 4). Most countries show a decrease in the GP's role in first contact care. In several transitional countries, Turkey, and Sweden the GP's role as a doctor of first contact has increased. GPs have become more involved in first contact care for women's and children's problems and less for psycho-social issues. In 1993, GPs in most Western European countries had a stronger role as the doctor of first contact care than in most of the transitional countries. In 2012 the distinction between the Western and transitional countries is much less obvious. Service profiles related to treatment of diseases have become broader in almost all countries, except for the Czech Republic, Lithuania, and Slovakia. A significant increase was found in GPs' involvement in treatment of diseases all over Europe. Minor technical procedures were carried out more frequently in nine countries in 2012 than in 1993. There was a significant fall in both Germany and Romania. The involvement in preventive activities decreased in most countries, though in the Netherlands a strong relative increase was observed.

Figure 1 a-d Relative changes in GPs' service profiles (%) 1993-2004



Conditions associated with changes

Table 1 presents a summary of the results of the relationship between the conditions at the national level and the changes in the breadth of GPs' service profiles. Beta coefficients and p-values are provided for the national conditions before and after adjustment for the breadth of services in 1993 and the relative increase in GDP. Appendix 5 provides detailed results. In countries with a stronger decrease in life expectancy during the early 1990s, there has been a stronger relative increase in GPs' involvement in first contact care.

However, this association disappeared after adjusting for the breadth of services in 1993 and after adjusting for the increase in GDP. Furthermore, it is found that, in countries with a higher increase in health care expenditures between 1993 and 2012, GPs' involvement in first contact care and in treatment of diseases increased. An increase in health care expenditure is also found to be associated with a relative increase in prevention, after adjustment for growth in GDP. After adjusting for the breadth of services in 1993, a stronger decrease was found in first contact care and treatment of diseases in countries with a stronger family orientation. Both of these indicators are seen as a condition that may have provided the countries with a stronger urgency to reform towards stronger primary care.

Finally, a moderately high positive association was found between the professional status of GPs and the relative increase in involvement in first contact care, but only after adjusting for the breadth of services in 1993. The professional status of GPs is in this study measured through indicators on the collective organisation of GPs in associations and the strength of family medicine within the medical education system, which may be used as tools to broaden service profiles of GPs in a country. Therefore this indicator is seen as part of the means of a country. No associations were found between the various conditions and the changes in the application of technical procedures. The hypotheses could not be confirmed for the increase in the elderly population, the political composition of the government, the level of government effectiveness, the centralization of the health care system, and the relative changes observed in GP service profiles.

Table 1 Results regression analyses between independent variables and the relative increase in breadth of service profiles (summary)

	First contact care	Treatment of diseases	Technical Procedures	Prevention
Urgency to reform				
In-/decrease in life expectancy '90 -'95				
<i>Model 1</i>				
Life expectancy: Stand. B (p-value)	-0.366 (0.055)*	0.255 (0.191)	-0.234 (0.231)	-0.066 (0.737)
<i>Model 1 + breadth service profiles 1993</i>				
Life expectancy: Stand. B (p-value)	-0.218 (0.135)	0.145 (0.431)	-0.174 (0.393)	-0.082 (0.649)
<i>Model 1 + GDP growth</i>				
Life expectancy: Stand. B (p-value)	-0.139 (0.560)	0.159 (0.538)	-0.323 (0.217)	-0.024 (0.927)
In-/decrease health care expenditure (% GDP)				
<i>Model 1</i>				
Health care expenditure: Stand. B (p-value)	0.115 (0.562)	0.432 (0.022)*	-0.014 (0.945)	0.275 (0.156)
<i>Model 1 + breadth service profiles 1993</i>				
Health care expenditure: Stand. B (p-value)	0.315 (0.028)*	0.339 (0.057)*	0.060 (0.768)	0.206 (0.256)
<i>Model 1 + GDP growth</i>				
Health care expenditure: Stand. B (p-value)	0.364 (0.060)*	0.397 (0.056)*	0.021 (0.924)	0.376 (0.081)*

– Table 1 to be continued –

	First contact care	Treatment of diseases	Technical Procedures	Prevention
In-/decrease % population >65 (n=28)				
<i>Model 1</i>				
Increase in % population >65: Stand. B (p-value)	0.072 (0.714)	0.017 (0.931)	-0.008 (0.969)	0.078 (0.695)
<i>Model 1 + breadth service profiles 1993</i>				
Increase in % population >65: Stand. B (p-value)	-0.131 (0.383)	-0.021 (0.908)	-0.121 (0.573)	0.229 (0.219)
<i>Model 1 + GDP growth</i>				
Increase in % population >65: Stand. B (p-value)	-0.091 (0.639)	0.118 (0.569)	-0.020 (0.925)	0.057 (0.792)
Family orientation (n=25)				
<i>Model 1</i>				
Family orientation: Stand. B (p-value)	0.314 (0.126)	-0.201 (0.335)	0.077 (0.714)	-0.152 (0.469)
<i>Model 1 + breadth service profiles 1993</i>				
Family orientation: Stand. B (p-value)	-0.347 (0.095)*	-0.451 (0.019)*	-0.270 (0.413)	-0.052 (0.788)
<i>Model 1 + GDP growth</i>				
Family orientation: Stand. B (p-value)	0.137 (0.535)	-0.079 (0.738)	0.071 (0.774)	-0.232 (0.340)

– Table 1 to be continued –

	First contact care	Treatment of diseases	Technical Procedures	Prevention
Politics				
Left-wing government (n=27)				
<i>Model 1</i>				
Left-wing government: Stand. B (p-value)	0.015 (0.941)	0.224 (0.269)	-0.079(0.661)	0.023 (0.908)
<i>Model 1 + breadth service profiles 1993</i>				
Left-wing government: Stand. B (p-value)	0.138 (0.386)	0.254 (0.208)	-0.050 (0.755)	0.178 (0.346)
<i>Model 1 + GDP growth</i>				
Left-wing government: Stand. B (p-value)	0.075 (0.682)	0.191 (0.333)	-0.071 (0.733)	0.034 (0.870)
Means				
Government effectiveness (n=28)				
<i>Model 1</i>				
Government effectiveness: Stand. B (p-value)	-0.560 (0.002)*	-0.110 (0.577)	-0.099(0.615)	0.081 (0.683)
<i>Model 1 + breadth service profiles 1993</i>				
Government effectiveness: Stand. B (p-value)	-0.069 (0.760)	0.227 (0.293)	0.176 (0.533)	0.075 (0.679)
<i>Model 1 + GDP growth</i>				
Government effectiveness: Stand. B (p-value)	-0.470 (0.034)*	-0.434 (0.073)*	-0.089 (0.735)	0.213 (0.404)

– Table 1 to be continued –

	First contact care	Treatment of diseases	Technical Procedures	Prevention
Centralization health care system (n=28)				
<i>Model 1</i>				
Centralization health care system: Stand. B (p-value)	0.284 (0.143)	-0.091 (0.644)	0.280 (0.149)	0.084 (0.669)
<i>Model 1 + breadth service profiles 1993</i>				
Centralization health care system: Stand. B (p-value)	0.211 (0.140)	-0.011 (0.953)	0.249 (0.201)	0.125 (0.489)
<i>Model 1 + GDP</i>				
Centralization health care system: Stand. B (p-value)	0.121 (0.543)	0.017 (0.936)	0.302 (0.165)	0.062 (0.781)
Professional status GPs				
<i>Model 1</i>				
Professional status: Stand. B (p-value)	0.211 (0.281)	0.188 (0.337)	-0.009 (0.963)	0.062 (0.752)
<i>Model 1 + breadth service profiles 1993</i>				
Professional status: Stand. B (p-value)	0.259 (0.066)*	0.251 (0.156)	-0.018 (0.927)	0.031 (0.867)
<i>Model 1 + GDP</i>				
Professional status: Stand. B (p-value)	0.142 (0.437)	0.237 (0.226)	-0.003 (0.987)	0.050 (0.805)

* significant at p<0.10

Discussion

The service profiles of GPs in Europe have developed in various directions during the past two decades. GPs in transitional countries and Turkey have increased their involvement in one or more areas. Considerable changes were observed, indicating that it is possible to reform health services extensively in a country. Although developments in Western Europe were less evident, a general trend of increased involvement of GPs in treatment of diseases and decreased involvement in the other areas, specifically in preventive activities, could be observed. From this study it is not known whether there is less availability of these preventive services in the countries, or if these activities have been taken up by other health care providers.

The conditions related to the “will” and “means” of governments to strengthen primary care were related to changes in the involvement of GPs in first contact care, in treatment of diseases and in prevention. The hypotheses were confirmed for features that are related to the urgency to reform. A strong positive association was found between the increase in health care expenditures and the relative increase in GPs’ service profiles. Policy-makers are most probably under greater pressure when there are financial indications of a problem. In countries with a stronger family orientation the involvement of GPs decreased. The political composition of the countries’ governments was not associated with the change in service profiles. Both findings on left-wing party dominance and family orientation are confirmed by a previous study [28]. Finally, it was confirmed that a stronger professional status of GPs is positively associated with changes in first contact care. A strong point of this study is that large samples of GPs in many European countries have been surveyed, systematically, regarding the services they deliver. The fact that, in 2012, this has been done in a similar way to what was undertaken in 1993 has provided us with comparative information on the involvement of European GPs during an important period relating to primary health care policy. Associations with various circumstances at a national level could be tested for both 1993 and 2012. Due to the sampling strategy, scale scores at the country level could be constructed in a multilevel model in which GPs are grouped within countries.

A possible weakness is that the samples of two countries are not entirely comparable. The sample of Germany in 1993 concerned only West Germany, but in 2012 covered the whole of a united Germany. In 1993 data were collected for the whole of the UK, while the 2012 sample concerns only part of England. A limitation of the use of the variable on political composition as an indicator for politics in a country is that it does not take into account the stability of governments. Nevertheless, we have also included a composite measure on government effectiveness, which comprises information on the credibility of the government's commitment to policies [26]. Furthermore, there are many other conditions that we did not measure in this study, but which may also play a role in the changes to GP service profiles. For example, changes in the method of remuneration of GPs may have influenced this. Ideally, we should also have evaluated the interdependence of conditions of will and means [25], but also the interdependence of the four components of the service profiles. For the latter it could be hypothesized that the increase in one area, e.g. treatment of diseases, may have led to the decrease in another area, e.g. preventive activities. However, the low number of observations (n=28 countries) makes it possible only to include a maximum of two variables in the analyses at the same time. This study evaluated changes in the service profiles of GPs in European countries. Even though the countries have been treated as separate units of analysis, it must be noted that European countries are not independent of each other. This is also known as Galton's problem. Countries border each other, which means that they can influence each other. The countries included are, for the most part, members of the European Union, which may also have influenced developments in health services. Another remaining issue is that this study does not allow us to make causal inferences. As the study concerns a cross-sectional survey, the direction of the associations is not certain. The results of this study provide insight into changes in service profiles and provide guidance for the development of training programmes for GPs, tailored to the needs of European countries. For example, most European countries show a decrease in the involvement of GPs in preventive activities, which include, for example, the measurement of blood pressure and cholesterol, but also health education. These are important tasks for GPs and so national governments should consider

what is behind this and whether this role should be strengthened again. It is not always likely that these tasks are currently carried out by other professionals outside the GP practice. Furthermore, this study provides more general lessons, which may also be applicable to service reforms in other health care contexts, countries or even in other sectors. It has been found that the changes in GP service profiles are only associated to a limited extent with conditions at the national level. A main driver for reform seems, however, to be health care expenditure. Factors associated with the change of the breadth of GP service profiles are probably also present at the level of the individual GP practice. If a country's government intends to strengthen the role of GPs, the role of conditions at the practice level needs to be taken into account.

References

- 1 Marrée J, Groenewegen PP. Back to Bismarck: Eastern European health care systems in transition. Aldershot: Avebury; 1997.
- 2 Saltman RB, Figueras J. European health care reform: Analysis of current strategies. Copenhagen: WHO Regional Office for Europe; 1997.
- 3 McKee M, Healy J, Falkingham J. Health care in central Asia. Buckingham: Open University Press; 2002.
- 4 Boerma WG, Dubois CA. Mapping primary care across Europe. In: Saltman RB, Rico A, Boerma WG, editors. Primary care in the driver's seat? Organizational reform in European primary care. European Observatory on Health Systems and Policies Series. Maidenhead: Open University Press; 2006. p 22–47.
- 5 Groenewegen PP, Dourgnon P, Grefß S, et al. Strengthening weak primary care systems: Steps towards stronger primary care in selected western and eastern European countries. *Health Policy*. 2013;170–179.
- 6 Seifert B, Svab I, Madis T, et al. Perspectives of family medicine in Central and Eastern Europe. *Fam Pract* 2008;25:113–118.
- 7 Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q* 2005;83:457–502.
- 8 Delnoij D, Van MG, Paulus A, Groenewegen P. Does general practitioner gatekeeping curb health care expenditure? *J Health Serv Res Policy* 2000;5:22–26.
- 9 Shi L, Starfield B, Politzer R, Regan J. Primary care, self-rated health, and reductions in social disparities in health. *Health Serv Res* 2002;37:529–550.
- 10 Kringos DS, Boerma WG, Hutchinson A, et al. The breadth of primary care: A systematic literature review of its core dimensions. *BMC Health Serv Res* 2010;10:65.

- 11 Boerma WG, Rico A. Changing conditions for structural reform in primary care. In: Saltman RB, Rico A, Boerma WG, editors. Primary care in the driver's seat? Organizational reform in European primary care. Maidenhead: Open University Press; 2006. p 50–67.
- 12 Rico A, Saltman RB, Boerma WG. Organizational restructuring in European health systems: The role of primary care. *Social Policy and Administration* 2003;37:592–608.
- 13 Grielen SJ, Boerma WG, Groenewegen PP. Unity or diversity? Task profiles of general practitioners in Central and Eastern Europe. *Eur J Public Health* 2000:249–254.
- 14 Boerma WG, Van der Zee J, Fleming DM. Service profiles of general practitioners in Europe. European GP Task Profile Study. *Br J Gen Pract* 1997;47:481–486.
- 15 McKee M, Mackenbach JP. The will and the means to implement health policies. In: Mackenbach JPM, M, editor. Successes and failures of health policy in Europe: Four decades of divergent trends and converging challenges. Maidenhead: Open University Press; 2013 p 66–77.
- 16 Mackenbach JP, McKee M. A comparative analysis of health policy performance in 43 European countries. *Eur J Public Health* 2013;23:195–201.
- 17 Kingdon J. *Agendas, alternatives and public policies*. Boston, MA: Little Brown; 1984.
- 18 Groenewegen PP, Dixon J, Boerma WG. The regulatory environment of general practice: An international perspective. In: Saltman RB, Busse R, Mossialos E, editors. *Regulating entrepreneurial behaviour in European health care systems*. Buckingham and Philadelphia: Open University Press; 2002.
- 19 Schäfer WLA, Boerma WG, Kringos DS, et al. QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care. *BMC Fam Pract* 2011;12:115.
- 20 Schäfer WLA, Boerma WG, Kringos DS, et al. Measures of quality, costs and equity in primary health care: Instruments developed to analyse and compare primary health care in 35 countries. *Qual Prim Care* 2013;21:67–79.

- 21 Boerma WGW. Profiles of general practice in Europe: An international study of variation in the tasks of general practitioners. PhD thesis, Utrecht; 2003.
- 22 Groenewegen PP; Greß S; Schäfer WLA. Participation of general practitioners in a large multi-country combined general practitioner: Patient survey. Paper to be submitted; 2014.
- 23 World Databank [Internet]. 2014 [cited 10 March 2014]. Website: <http://databank.worldbank.org/data/home.-aspx>- Accessed on 6 May 2014
- 24 TNS Opinion & Social & TNS. Special eurobarometer 283 health and long-term care in the European Union. Brussels: European Commission; 2007.
- 25 Armingeon KC, R, Knöpfel L, Weisstanner D, et al. Comparative Political Data Set III 1990–2011. In: Institute of Political Science UoB, editor. Berne; 2013.
- 26 [26] Teorell JC, N, Dahlberg S, Holmberg S, et al. The Quality of Government Basic Dataset made from “The Quality of Government Dataset, version 15 May 13”. University of Gothenburg, Quality of Government Institute, editor. 2013.
- 27 Kringos DS, Boerma WG, Bourgueil Y, et al. The European primary care monitor: Structure, process and outcome indicators. *BMC Fam Pract* 2010;11:81.
- 28 Kringos DS, Boerma WGW, Van der Zee J, Groenewegen PP. Political, cultural and economic foundations of primary care in Europe. *Soc Sci Med* 2013;99.
- 29 Raudenbush SW; Sampson RJ. Ecometrics: Toward a science of assessing ecological settings, with application to the systematic social observation of neighborhoods. *Sociological Methodology* 1999;29:1–41.
- 30 Van Schoten SB, RJ, Spreeuwenberg P, De Bruijne C, et al. The ecometric properties of a measurement instrument for prospective risk analysis in hospital departments. *BMC Health Serv Res* 2014;14(103).

Appendices

Appendix 1 Measurement of first contact role and breadth of service profiles

First contact care	(Almost) always	Usually	Occasionally	Seldom/ never
<p>In case of the following health problems, to what extent will patients in your practice population (people who normally apply to you for primary medical care) contact you as the first health care provider? (This is only about the first contact, not about further diagnosis or treatment).</p>				
1. Child with severe cough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Child aged 8 with hearing problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Woman aged 18 asking for oral contraception	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Man aged 24 with stomach pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Man aged 45 with chest pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Woman aged 50 with a lump in her breast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Woman aged 60 with deteriorating vision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Woman aged 60 with polyuria	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Woman aged 60 with acute symptoms of paralysis/paresis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Man aged 70 with joint pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Woman aged 75 with moderate memory problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Man aged 35 with sprained ankle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Man aged 28 with a first convulsion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Anxious man aged 45	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Physically abused child aged 13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Couple with relationship problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Woman aged 50 with psycho-social problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Man aged 32 with sexual problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Man aged 52 with alcohol addiction problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Treatment of diseases To what extent are you involved in the treatment and follow-up of patients in your practice population with the following diagnoses (“practice population” means: people who normally apply to you for primary medical care)?	(Almost) always	Usually	Occasionally	Seldom/never
1. Chronic bronchitis/ COPD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Hordeolum (Stye)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Peptic ulcer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Herniated disc lesion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Congestive heart failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Pneumonia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Peritonsillar abscess	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Parkinson’s disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Uncomplicated diabetes (type II)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Rheumatoid arthritis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Depression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Myocardial infarction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical procedures To what extent are the following activities carried out in your practice population by you, or your staff, and not by a medical specialist? (Practice population means: people normally applying to you for primary medical care). For example, if fundoscopy is almost always done by you, tick that box.	Almost always	Usually	Occasionally	Seldom/never
1. Wedge resection of ingrown toenail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Removal of sebaceous cyst from the hairy scalp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Wound suturing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Excision of warts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Insertion of IUD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Fundoscopy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Joint injection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Strapping an ankle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9. Cryotherapy (warts)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10. Setting up an intravenous infusion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<p>Prevention</p> <p>When do you, or your staff, measure <u>blood pressure</u>? (more than one answer possible)</p> <p>When do you, or your staff, measure <u>blood cholesterol</u> level? (more than one answer possible)</p> <p>To what extent are you involved in health education as regards the following topics: (More than one answer possible)</p> <p>1. Smoking</p> <p>2. Diet</p> <p>3. Problematic use of alcohol</p>	<p><input type="checkbox"/> In connection with relevant clinical <u>conditions</u></p> <p><input type="checkbox"/> On <u>request</u></p> <p><input type="checkbox"/> Routinely in office contacts with adults (<u>regardless</u> of the reason for visit)</p> <p><input type="checkbox"/> In adults <u>invited</u> for this purpose</p> <p><input type="checkbox"/> In connection with relevant clinical <u>conditions</u></p> <p><input type="checkbox"/> On <u>request</u></p> <p><input type="checkbox"/> Routinely in office contacts with adults (<u>regardless</u> of the reason for visit)</p> <p><input type="checkbox"/> In adults <u>invited</u> for this purpose</p> <p><input type="checkbox"/> No such measures</p> <p>Not involved In connection with normal patient contacts In group sessions or special programmes</p>	<p><input type="checkbox"/></p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Appendix 2 Explanation and results of the scale construction

Box 1 Explanation of scale construction

Scale scores on the GP service profiles were computed using the econometrics approach. This accounts for differences in the number of respondents on which the estimation is based, individual differences in response to certain items, and for dependency among the items that measure the latent variable [29]. In the multilevel model an additional level is added for the related variables, or items, of which the scale is composed. A three level model was used (items nested within GPs, and GPs nested within countries). A weighted item average was used for each item to calculate an average scale value. This was done by using the item weights for the fixed effects. Finally, the item variance, an indication of the measurement error, was taken into account [29,30]. Reliability scores for each scale for 1993 and 2012 were calculated and varied between 0.73 and 1.00 at the country level and between 0.61 and 0.97 at the GP practice level.

Table 1 Reliability of scales at GP practice and country level before adjustment for background characteristics

Scale	GP practice level	Country level
1. 1993 First contact of care	0.87	0.99
2. 1993 Treatment of diseases	0.78	0.98
3. 1993 Technical procedures	0.77	0.99
4. 1993 Prevention	0.97	0.73
5. 2012 First contact of care	0.86	0.98
6. 2012 Treatment of diseases	0.86	0.98
7. 2012 Technical procedures	0.75	1.00
8. 2012 Prevention	0.61	0.97

Table 2 Results of multilevel regression analyses after adjustment for background characteristics

	Model: First contact care n _i =32*; n _j =12534	Model: Treat- ment of diseases n _i =32*; n _j =12493	Model: technical procedures n _i =32*; n _j =12374	Model: Prevention n _i =32*; n _j =12559
Cons	2.985 (0.069)	2.973 (0.042)	2.105 (0.107)	0.245 (0.018)
Year (2012)	-0.089 (0.056)	0.278 (0.043)	-0.017 (0.050)	-0.054 (0.019)
Age	-0.001 (0.000)	0.002 (0.000)	-0.001 (0.000)	0.000 (0.000)
Sex (Female)	-0.011 (0.009)	-0.036 (0.008)	-0.152 (0.009)	-0.003 (0.003)
Practice location**:				
- Big (inner) city	-0.163 (0.012)	-0.096 (0.011)	-0.260 (0.013)	-0.003 (0.005)
- Suburbs/small town	-0.137 (0.011)	-0.069 (0.010)	-0.203 (0.011)	-0.002 (0.004)
- Mixed urban/rural	-0.069 (0.012)	-0.038 (0.011)	-0.070 (0.013)	0.011 (0.005)
Duo/ group practice***	-0.003 (0.009)	-0.011 (0.009)	0.054 (0.010)	-0.003 (0.004)

– Table 2 to be continued –

	Model: First contact care ni=32*; nj=12534	Model: Treat- ment of diseases ni=32*; nj=12493	Model: technical procedures ni=32*; nj=12374	Model: Prevention ni=32*; nj=12559
Variance <u>within</u> countries				
1993	0.177 (0.003)	0.139 (0.002)	0.196 (0.003)	0.044 (0.001)
2012	0.176 (0.003)	0.172 (0.003)	0.173 (0.003)	0.019 (0.000)
Variance <u>between</u> countries				
1993	0.215 (0.044)	0.092 (0.020)	0.684 (0.125)	0.013 (0.003)
2012	0.159 (0.033)	0.115 (0.024)	0.679 (0.124)	0.014 (0.003)
ICC				
1993	54.8%	39.7%	77.7%	23.3%
2012	47.6%	40.0%	79.7%	41.2%

– Table 2 to be continued –

	Model: First contact care ni=32*; nj=12534	Model: Treat- ment of diseases ni=32*; nj=12493	Model: technical procedures ni=32*; nj=12374	Model: Prevention ni=32*; nj=12559
Correlation coefficient of countries between years	0.633	0.606	0.907	0.444

* Scales were constructed on the basis of the larger datasets including four extra European countries. However, in the main analyses four countries were taken out as these were only included in one of the two years.

** Reference category= Rural practice location

*** Reference category= solo practice; Italic = Significant at $p < 0.05$; ni= Country; nj= General Practitioners. Reference category for practice location is "Rural" ICC= Intraclass Correlation.

Appendix 3 Overview of independent variables

Country	In-/decrease in life expectancy '90 – '95	In-/decrease HC expen- diture (% GDP) '95 – '12	In-/decrease population >65 '93-'12	% Family orientation *	Left-wing govern- ment **	Government effectiveness ***	Centraliza- tion HC system ****	Profes- sional status GPs *****	Increase GDP per capital '93 – '12
Austria	0.31	1.88	3.07	46.06	5.75	1.86	0	2.00	38.25
Belgium	0.21	3.18	1.96	37.95	8.25	1.81	0	2.75	28.54
Bulgaria	-0.16	2.18	4.55	79.59	4.25	-0.31	1	2.75	88.05
Czech Rep.	0.47	0.97	3.15	65.04	6.25	0.62	0	2.50	65.01
Denmark	0.11	3.07	2.00	21.97	6.25	1.91	0	2.75	24.28
Estonia	-0.55	-0.38	5.08	59.52	5.00	0.57	1	3.00	135.85
Finland	0.42	1.30	4.42	31.12	7.00	1.42	0	3.00	55.21
Germany	0.33	1.17	5.85	53.78	9.00	1.84	0	2.50	29.42
Greece	0.17	0.68	4.81	86.26	11.75	0.82	0	2.50	21.80
Hungary	0.14	0.50	3.00	70.18	10.00	0.84	0	3.00	52.64

– Appendix 3 to be continued –

Country	In-/decrease in life expectancy '90 – '95	In-/decrease HC expen- diture (% GDP) '95 – '12	In-/decrease population >65 '93-'12	% Family orientation *	Left-wing govern- ment **	Government effectiveness ***	Centraliza- tion HC system ****	Profes- sional status GPs *****	Increase GDP per capital '93 – '12
Iceland	-0.01	0.86	1.53	.	3.50	1.80	1	2.00	40.68
Ireland	0.22	1.52	0.27	41.74	3.25	1.71	1	3.00	10.65
Italy	0.31	2.11	4.81	50.89	4.50	0.82	0	2.50	9.51
Latvia	-0.84	0.22	5.64	70.55	5.25	0.19	1	2.50	169.32
Lithuania	-0.61	1.28	3.93	74.17	8.50	0.32	1	3.00	140.43
Luxembourg	0.40	1.29	0.36	45.28	6.50	2.05	0	2.00	41.27
Netherlands	0.14	4.11	3.40	22.81	6.25	2.01	0	3.00	35.02
Norway	0.31	0.44	-0.68	.	10.25	2.02	0	3.00	36.14
Poland	0.28	1.24	3.33	84.38	7.00	0.78	0	3.00	128.22
Portugal	0.36	1.93	4.04	57.96	7.75	1.15	0	3.00	25.37
Romania	-0.08	1.89	3.52	78.62	9.50	-0.51	0	3.00	77.39
Slovakia	0.37	1.74	2.02	74.91	5.75	0.57	0	2.50	119.33
Slovenia	0.21	1.30	5.43	45.21	9.50	0.89	1	3.00	66.34
Spain	0.30	2.17	2.81	57.80	10.00	1.62	0	2.00	32.18

– Appendix 3 to be continued –

Country	In-/decrease in life expectancy '90 –'95	In-/decrease HC expen- diture (% GDP) '95 – '12	In-/decrease population >65 '93-'12	% Family orientation *	Left-wing govern- ment **	Government effectiveness ***	Centraliza- tion HC system ****	Profes- sional status GPs *****	Increase GDP per capital '93 – '12
Sweden	0.31	1.65	1.28	14.82	12.00	1.96	0	3.00	52.25
Switzerland	0.30	1.96	2.82	.	4.50	1.91	0	3.00	19.40
Turkey	0.83	2.93	2.42	81.92	.	-0.01	0	2.50	56.25
UK	0.25	2.68	1.34	44.58	13.00	1.88	1	2.50	41.64

* % Pop. prefers offspring to take care of one or both parents in case of ill health (2007)

** Weighted years left party dominance between 1995 and 2012

*** Mean of the scores between 1996 and 2011

**** 1=Centralized, 0=Decentralized

***** Measured on a scale between 1 and 3 (2009/10);

.=Missing value

Appendix 4 Breadth of GP service profiles and relative changes between 1993 and 2012

	First contact care GP			Treatment of diseases			Technical procedures			Prevention		
	1993*	2012	Relative change	1993	2012	Relative change	1993	2012	Relative change	1993	2012	Relative change (%)
Austria	3.05	2.79	-8.6%	3.08	3.33	8.0%	2.14	2.08	-2.7%	0.33	0.3	-7.8%
Belgium	3.1	3.01	-2.9%	2.97	3.33	12.2%	2.57	2.35	-8.4%	0.22	0.17	-23.5%
Bulgaria	2.31	2.98	29.0%	2.76	3.17	14.7%	1.31	1.86	41.5%	0.28	0.21	-25.4%
Czech Rep.	2.99	2.45	-18.0%	2.83	2.71	-4.3%	1.62	1.49	-8.3%	0.19	0.23	18.2%
Denmark	3.5	3.39	-3.2%	3.11	3.54	13.8%	2.73	2.57	-6.1%	0.15	0.07	-53.6%
Estonia	2.58	2.75	6.6%	3.09	3.24	4.9%	1.35	1.68	24.5%	0.26	0.28	5.2%
Finland	3.06	2.73	-11.0%	2.82	3.28	16.5%	3.47	3.34	-3.7%	0.22	0.08	-65.5%
Germany	3.05	2.82	-7.6%	3.19	3.46	8.4%	2.29	1.82	-20.5%	0.46	0.36	-22.8%
Greece	2.79	2.64	-5.5%	2.92	3	2.7%	2.13	2.36	10.7%	0.23	0.35	49.6%
Hungary	3.22	2.7	-16.1%	3.04	3.34	10.1%	1.45	1.41	-2.9%	0.31	0.15	-52.2%
Iceland	3.11	2.73	-12.3%	2.96	3	1.2%	3.11	2.91	-6.5%	0.22	0.1	-56.7%
Ireland	3.41	3.25	-4.7%	3.2	3.59	12.3%	2.40	2.65	10.0%	0.21	0.2	-6.3%

– Appendix 4 to be continued –

	First contact care GP			Treatment of diseases			Technical procedures			Prevention		
	1993*	2012	Relative change	1993	2012	Relative change	1993	2012	Relative change	1993	2012	Relative change (%)
Italy	3.22	2.88	-10.5%	3.06	3.36	9.8%	1.48	1.44	-2.8%	0.25	0.07	-73.6%
Latvia	2.54	2.66	4.8%	3	3.24	7.9%	1.71	1.54	-9.5%	0.18	0.16	-14.1%
Lithuania	2.68	3.16	17.8%	3.11	2.97	-4.4%	1.33	1.45	8.5%	0.25	0.31	20.0%
Luxembourg	2.8	2.68	-4.4%	2.92	3.1	6.2%	2.19	2.07	-5.7%	0.18	0.15	-13.3%
Netherlands	3.60	3.35	-7.0%	2.86	3.34	16.9%	2.94	3.25	10.6%	0.05	0.14	199.7%
Norway	3.27	3.22	-1.5%	3.18	3.52	10.6%	2.89	3.11	7.7%	0.19	0.11	-41.6%
Poland	2.85	2.65	-7.0%	3.11	3.21	3.3%	1.46	1.37	-6.1%	0.26	0.07	-71.6%
Portugal	3.22	3.05	-5.4%	3.14	3.3	5.1%	1.75	1.79	2.0%	0.45	0.16	-64.3%
Romania	2.45	2.88	17.3%	2.62	3.32	26.7%	1.92	1.49	-22.1%	0.34	0.12	-63.9%
Slovakia	2.59	2.61	0.7%	2.68	2.61	-2.7%	1.48	1.39	-6.2%	0.15	0.25	62.0%
Slovenia	3.24	3.01	-7.3%	2.92	3.65	25.2%	1.98	1.77	-10.4%	0.25	0.36	45.4%
Spain	3.32	3.18	-4.3%	3.03	3.52	16.2%	1.72	2.28	32.9%	0.35	0.23	-35.5%
Sweden	3.04	3.4	11.6%	3.11	3.56	14.3%	2.89	3.00	4.0%	0.14	0.13	-10.5%

– Appendix 4 to be continued –

	First contact care GP			Treatment of diseases			Technical procedures			Prevention		
	1993*	2012	Relative change	1993	2012	Relative change	1993	2012	Relative change	1993	2012	Relative change (%)
Switzerland	3.02	2.9	-4.2%	3.16	3.43	8.4%	2.9	2.54	-12.2%	0.27	0.23	-15.8%
Turkey	2.07	2.45	18.4%	2.11	2.78	32.0%	1.88	1.79	-4.3%	0.1	0.09	-12.1%
UK/ England	3.50	3.27	-6.4%	3.25	3.57	10.1%	2.79	2.62	-5.9%	0.43	0.4	-6.1%

* Breadth of services is measured at a scale from 1-4; Note: Germany: the 1993 sample included only West Germany while the 2012 sample includes a sample from the whole of Germany; UK/England: The 2012 sample included practices from the UK and the 1993 sample only from England

Appendix 5 Outcomes regression analyses, detailed

	First contact care	Treatment of diseases	Technical procedures	Prevention
Urgency of reform				
In-/ decrease in life expectancy 1990 –1995				
Model 1				
Life expectancy: Stand. B (p-value)	-0.366 (0.055)*	0.255 (0.191)	-0.234 (0.231)	-0.066 (0.737)
R ²	0.134	0.065	0.055	0.004
Model 1 + breadth service profiles 1993				
Life expectancy: Stand. B (p-value)	-0.218 (0.135)	0.145 (0.431)	-0.174 (0.393)	-0.082 (0.649)
Breadth service profiles 1993: Stand. B (p-value)	-0.645 (0.000)*	-0.424 (0.028)*	-0.201 (0.323)	-0.451 (0.018)*
R ²	0.528	0.233	0.092	0.208
Model 1 + GDP				
Life expectancy: Stand. B (p-value)	-0.139 (0.560)	0.159 (0.538)	-0.323 (0.217)	-0.024 (0.927)
Increase in GDP: Stand. B (p-value)	0.347 (0.154)	-0.146 (0.569)	-0.138 (0.595)	0.064 (0.890)
R ²	0.203	0.077	0.066	0.007

– Appendix 5 to be continued –

	First contact care	Treatment of diseases	Technical procedures	Prevention
In-/ Increase health care expenditure (% GDP)				
Model 1				
Health care expenditure: Stand. B (p-value)	0.115 (0.562)	0.432 (0.022)*	-0.014 (0.945)	0.275 (0.156)
R ²	0.013	0.187	0.000	0.076
Model 1 + breadth service profiles 1993				
Health care expenditure: Stand. B (p-value)	0.315 (0.028)*	0.339 (0.057)*	0.060 (0.768)	0.206 (0.256)
Breadth service profiles 1993: Stand. B (p-value)	-0.776 (0.000)*	-0.378 (0.035)*	-0.269 (0.192)	-0.413 (0.028)*
R ²	0.575	0.321	0.067	0.242
Model 1 + GDP				
Health care expenditure: Stand. B (p-value)	0.364 (0.060)*	0.397 (0.056)*	0.021 (0.924)	0.376 (0.081)
Increase in GDP: Stand. B (p-value)	0.591 (0.004)*	-0.083 (0.679)	0.083 (0.710)	0.239 (0.259)
R ²	0.301	0.192	0.006	0.123
% population >65 (n=28)				
Model 1				
Increase in % population >65: Stand. B (p-value)	0.072 (0.714)	0.017 (0.931)	-0.008 (0.969)	0.078 (0.695)
R ²	0.005	0.000	0.000	0.006

– Appendix 5 to be continued –

	First contact care	Treatment of diseases	Technical procedures	Prevention
Model 1 + breadth service profiles 1993				
Increase in % population >65: Stand. B (p-value)	-0.131 (0.383)	-0.021 (0.908)	-0.121 (0.573)	0.229 (0.219)
Breadth service profiles 1993: Stand. B (p-value)	-0.731 (0.000)*	-0.463 (0.015)*	-0.304 (0.164)	-0.515 (0.009)*
R ²	0.499	0.213	0.076	0.249
Model 1 + GDP				
Increase in % population >65: Stand. B (p-value)	-0.091 (0.639)	0.118 (0.569)	-0.020 (0.925)	0.057 (0.792)
Increase in GDP: Stand. B (p-value)	0.470 (0.021)*	-0.291 (0.168)	0.081 (0.706)	0.061 (0.778)
R ²	0.135	0.075	0.006	0.009
Family orientation (n=25)				
Model 1				
Family orientation: Stand. B (p-value)	0.314 (0.126)	-0.201 (0.335)	0.077 (0.714)	-0.152 (0.469)
R ²	0.099	0.040	0.006	0.023
Model 1 + breadth service profiles 1993				
Family orientation: Stand. B (p-value)	-0.347 (0.095)*	-0.451 (0.019)*	-0.270 (0.413)	-0.052 (0.788)
Breadth service profiles 1993: Stand. B (p-value)	-0.946 (0.000)*	-0.653 (0.001)*	-0.447 (0.181)	-0.470 (0.022)*
R ²	0.556	0.404	0.085	0.234

– Appendix 5 to be continued –

	First contact care	Treatment of diseases	Technical procedures	Prevention
<i>Model 1 + GDP</i>				
Family orientation: Stand. B (p-value)	0.137 (0.535)	-0.079 (0.738)	0.071 (0.774)	-0.232 (0.340)
Increase in GDP: Stand. B (p-value)	0.365 (0.109)	-0.252 (0.291)	0.013 (0.958)	0.166 (0.493)
R ²	0.200	0.089	0.006	0.044
Politics				
Left-wing government (n=27)				
Model 1				
Left-wing government: Stand. B (p-value)	0.015 (0.941)	0.224 (0.269)	-0.079 (0.661)	0.023 (0.908)
R ²	0.000	0.050	0.006	0.001
<i>Model 1 + breadth service profiles 1993</i>				
Left-wing government: Stand. B (p-value)	0.138 (0.386)	0.254 (0.208)	-0.050 (0.803)	0.178 (0.346)
Breadth service profiles 1993	-0.667 (0.000)*	-0.208 (0.300)	-0.254 (0.212)	-0.521 (0.010)*
R ²	0.431	0.092	0.070	0.249
Model 1 + GDP				
Left-wing government: Stand. B (p-value)	0.075 (0.682)	0.191 (0.333)	-0.071 (0.733)	0.034 (0.870)
Increase in GDP: Stand. B (p-value)	0.481 (0.014)*	-0.258 (0.195)	0.065 (0.755)	0.084 (0.684)

– Appendix 5 to be continued –

	First contact care	Treatment of diseases	Technical procedures	Prevention
R ²	0.228	0.116	0.010	0.008
Means				
Government effectiveness (n=28)				
Model 1				
Government effectiveness: Stand. B (p-value)	-0.560 (0.002)*	-0.110 (0.577)	-0.099 (0.615)	0.081 (0.683)
R ²	0.314	0.012	0.010	0.007
Model 1 + breadth service profiles 1993				
Government effectiveness: Stand. B (p-value)	-0.069 (0.760)	0.227 (0.293)	0.176 (0.533)	0.075 (0.679)
Breadth service profiles 1993	-0.642 (0.008)*	-0.591 (0.010)*	-0.380 (0.184)	-0.447 (0.019)*
R ²	0.485	0.248	0.079	0.206
Model 1 + GDP				
Government effectiveness: Stand. B (p-value)	-0.470 (0.034)*	-0.434 (0.073)*	-0.089 (0.735)	0.213 (0.404)
Increase in GDP: Stand. B (p-value)	0.145 (0.494)	-0.521 (0.034)*	-0.020 (0.938)	0.213 (0.404)
R ²	0.327	0.178	0.010	0.034
Centralization health care system (n=28)				
Model 1				

– Appendix 5 to be continued –

	First contact care	Treatment of diseases	Technical procedures	Prevention
Centralization health care system: Stand. B (p-value)	0.284 (0.143)	-0.091 (0.644)	0.280 (0.149)	0.084 (0.669)
R ²	0.081	0.008	0.078	0.007
Model 1 + breadth service profiles 1993				
Centralization health care system: Stand. B (p-value)	0.211 (0.140)	-0.011 (0.953)	0.249 (0.201)	0.125 (0.489)
Breadth service profiles 1993	-0.672 (0.000)*	-0.460 (0.017)*	-0.217 (0.261)	-0.459 (0.016)*
R ²	0.527	0.213	0.125	0.216
Model 1 + GDP				
Centralization health care system: Stand. B (p-value)	0.121 (0.543)	0.017 (0.936)	0.302 (0.165)	0.062 (0.781)
Increase in GDP: Stand. B (p-value)	0.387 (0.060)*	-0.258 (0.239)	-0.053 (0.803)	0.054 (0.807)
R ²	0.204	0.063	0.081	0.010
Professional status GPs				
Model 1				
Professional status: Stand. B (p-value)	0.211 (0.281)	0.188 (0.337)	-0.009 (0.963)	0.062 (0.752)
R ²	0.045	0.035	0.000	0.004

– Appendix 5 to be continued –

	First contact care	Treatment of diseases	Technical procedures	Prevention
Model 1 + breadth service profiles 1993				
Professional status: Stand. B (p-value)	0.259 (0.066)*	0.251 (0.156)	-0.018 (0.927)	0.031 (0.865)
Breadth service profiles 1993	-0.712 (0.000)*	-0.493 (0.008)*	-0.253 (0.202)	-0.446 (0.020)*
R ²	0.550	0.117	0.064	0.202
Model 1 + GDP				
Professional status: Stand. B (p-value)	0.142 (0.437)	0.237 (0.226)	-0.003 (0.987)	0.050 (0.805)
Increase in GDP: Stand. B (p-value)	0.414 (0.030)*	-0.290 (0.141)	0.074 (0.716)	0.072 (0.725)
R ²	0.212	0.117	0.006	0.009

*significant at p<0

5

Organisational characteristics facilitating a broader range of general practitioner service profiles: an international study

Schäfer WLA, Heinemann S, Boerma WGW, Greß S, Schellevis FG, Groenewegen PP: Organisational characteristics facilitating a broader range of general practitioner service profiles: an international study. Under review.

Abstract

Background

This study aims to gain insight into which organisational characteristics at the national and GP practice level can facilitate broader GP service profiles. We distinguish four areas of service profiles:

- first contact care for health problems;
- the treatment of, mainly, chronic conditions;
- the provision of minor technical procedures and
- preventive treatments.

Methods

A cross sectional survey was held among 7,183 GPs in 31 European and 3 non-European countries. Linear multilevel regression models were used to calculate the regression coefficients of the organisational characteristics at the national and GP practice level.

Results

In countries with a stronger national primary care structure GPs have broader service profiles in the areas of first contact care, treatment of chronic diseases and technical procedures, but not regarding preventive services. If GPs have a more community orientated vision, more medical instruments in the practice, collaborate more with other primary care providers and when out-of-hours care is delivered only within primary care they have broader service profiles in all areas. Preventive services are also facilitated by routine medical record keeping. Self-employed GPs have broader service profiles, except for preventive services compared to salaried GPs. Also, in comparison to GPs working in urban areas, GPs working in rural areas have broader service profiles, except for preventive services.

Conclusion

Preventive activities are influenced by the organisational characteristics only to a limited extent. The current view of what a strong primary care structure entails does not seem to promote preventive activities.

Introduction

A broad range of services offered by general practitioners (GPs) has various potential benefits. When services are too narrow, preventable illnesses may go untreated or patients may have illnesses longer than needed [1]. In countries where primary care providers have broader service profiles, patients have better health outcomes [2-5] and there are smaller disparities in health [6]. Recently we found, based on analyses of the QUALICOPC study, that when GPs offer a broader range of services, their patients experience better accessibility, continuity, comprehensiveness of care and more involvement in decision making [7]. Additionally, various studies found lower hospital admission rates for primary sensitive conditions [2,3]. However, hospital admissions rates for uncontrolled diabetes were higher in countries where GPs have broader service profiles. This was also found based on analyses within the framework of the QUALICOPC study[8]. Finally, in countries where primary care providers have broader service profiles, studies found total health care expenditures to increase at a slower rate [2] and the cost-effectiveness of health care to be higher [3,4].

The range of services which GPs offer to their patients is expected to be affected by the way primary care is organised in a country and by the organisation of the GP practice. We analyse the range of GP services with regards to four different dimensions of primary care service provision:

- first contact care for health problems;
- the treatment of, mainly, chronic conditions;
- the provision of minor technical procedures and
- preventive treatments [9-13].

A previous European study, conducted in 1993, showed that variation in the breadth of GP service profiles could be attributed to national level characteristics [10] and characteristics related to the context of the GP practice [14]. This previous study did not focus specifically on which organisational characteristics are related to broader GP service profiles. In the current study, we aim to answer the question which organisational characteristics at the national and GP practice level are associated with broader GP service profiles.

The organisation of primary care in a country is defined by three dimensions:

- the way primary care is governed, e.g. whether the national government has a policy aimed at providing equal access to primary care;
- the economic conditions, for example the relative expenditures on primary care, and
- the workforce development, e.g. the education programmes of the primary care providers [11-15].

In general, a local organisation can be defined as a system which aims to achieve certain outcomes and includes five conceptual domains: the vision, resources, the structure, professional and administrative processes, and the environment [16,17]. This definition can be applied to the organisation of GP practices. In this context, the conceptual domains can be explained as following:

- the vision which comprises the goals and orientations of the GP, e.g. whether the GP is community-oriented;
- the type and quantity of resources which are required to produce services, for example the number of disciplines working in the GP practice;
- the regulatory and local governance framework of practices are part of the structure of the organisation, e.g. the employment status of GPs;
- the professional and administrative processes of the practices behind the daily delivery of services [16 17], e.g. the availability of a walk-in-hour in a GP practice;
- the environment in which GP practices operate, for instance whether the practice is in a rural area.

In general, we expect that a pro-primary care national organisation will be related to broader GP service profiles. Additionally, the various characteristics of the local organisation are expected to be related to the breadth of GP service profiles (see figure 1). Specific hypotheses for each area can be found in Appendix 1.

Methods

Data collection

Within the framework of the QUALICOPC study (Quality and Costs of Primary Care in Europe), cross-sectional surveys were held among GPs in 31 European countries (EU 27 – except for France -, FYR Macedonia, Iceland, Norway, Switzerland, Turkey) and 3 non-European countries (Australia, Canada, New Zealand) between 2011 and 2013. In each country, a nationally representative sample of GPs (target: N= 220 GPs; Cyprus, Iceland, Luxembourg and Malta N=80 GPs) filled in the questionnaires. In Turkey, Spain, Belgium and Canada, larger samples were taken in order to enable comparisons between regions. Only one GP per practice or health centre was eligible to participate. GP questionnaires were filled in either on paper or electronically (online or via a tablet computer).

Ethical approval was acquired in accordance with the legal requirements in each country. The surveys were carried out anonymously. The GP questionnaire was filled in by 7,183 GPs (database version 4.3). Details about the study protocol and questionnaire development have been published elsewhere ([18,19]).

The breadth GP service profiles (dependent variables)

The questionnaires measured GPs' activities related to:

- their role in first contact care;
- the treatment of, mainly, chronic diseases;
- minor technical procedures; and
- preventive care.

For each of the first three areas, a number of topics was presented and GPs were asked to fill in their level of involvement on a four-point scale ranging from 'never' (1 point), to 'almost always or always' (4 points) [10-19]. For example, GPs were asked to state to what extent they are involved in the treatment of patients with a herniated intervertebral disc lesion or whether an anxious man aged 45 would contact him or her as the first health care provider. Regarding preventive activities, questions were included about GPs' systematic involvement in blood pressure measurement, cholesterol testing and health education (Yes/No) [13]. Scale scores for the breadth of service profiles in each of the four areas

were calculated using multilevel latent class analyses in three-level models (items nested within GPs, nested within countries). Appendix 2 provides an explanation of this method, the items included in the scales and the reliability scores of the scales.

Characteristics of the national structure and local practice organisation (independent variables)

The national structure of primary care was measured by:

- the strength of the governance of primary care in a country;
- the strength of the economic conditions of primary care in a country;
- the strength of the workforce development of primary care in a country;
- the overall strength of the primary care structure in a country.

The strength was measured on a scale from 1 (weak) to 3 (strong). The data for 30 countries were derived from the Primary Health Care Activity Monitor (PHAMEU) study[20]. Additionally, we collected data for Australia, Canada, New Zealand and the former Yugoslav Republic of Macedonia using the same methods as for the PHAMEU study [21]. Appendix 3 describes in more detail what these variables entail.

All other scale scores used as independent variables are calculated using multilevel latent class analyses. The content and reliability of the scales are presented in Appendix 4. The mean scores per country of the independent variables are presented in Appendix 5.

The vision was measured by:

- the self-reported community orientation of the GP: A scale score ranging from 1 to 4, in which a higher score indicates a higher community orientation.

The resources in the practice were measured by:

- the GP working in a solo or duo/group practice;
- number of other disciplines in the practice: A sum score ranging from 0 'No other disciplines' to 12 'All other disciplines' on the basis of the number from a list of 12 disciplines;
- number of medical instruments: A sum score varying from 0 'No medical instruments' to 31 'All medical instruments' on the basis of the number from a list of 31 medical instruments;

- the comprehensiveness of the medical record system: A sum score ranging from 0 'No items included' to 10 'All items included' on the basis of a list of ten items included in the medical files;
- the routine use of the medical record system (Y/N).

The structure of the practice was measured by:

- the employment status of the GP: salaried or self-employed;
- collaboration within primary care, measured through face-to-face meetings with professionals from other disciplines: A scale score ranging from 1 'Seldom or never' to 3 'More than once a month' on the basis of a list of ten disciplines.

The professional and administrative processes of practices were measured by:

- the use of a walk-in hour (Y/N);
- out-of-hours care:
 - 1) patients can use OOH arrangement only within primary care and this GP is involved;
 - 2) patients can use OOH arrangements only within primary care but the GP is not involved;
 - 3) patients can use OOH arrangements (also) in secondary care;
 - 4) Other arrangements are in place.

The practice environment was measured by:

- the degree of urbanization of the practice location (Big inner city; suburbs or small town; urban-rural or rural).

Statistical analyses

The multicollinearity between the independent variables was tested through calculating Inflation Factors (VIF). This was done to avoid the correlations between the independent variables that were used in the same models being too high. All VIF values were below 3, indicating that the variables did not interfere with each other.

Next, linear multilevel regression models were used to calculate the variances at the country and GP practice level and to calculate the regression coefficients of the independent variables. As the highest (country) level only includes 34 observations, national level independent variables were included one by one, presented in models 1-4 of the Appendices 7-10. Significance levels of $p < 0.05$ were used for practice characteristics and $p < 0.1$ for national level characteristics due to the low

number of higher level observations (n=34). In all models, we adjusted for the age and gender of the GPs. We added dummy variables for the missing values of the variables 'walk-in-hour' and 'out-of-hours-services' to avoid losing cases. To evaluate the associations with the practice characteristics, we used the model in which we also adjusted for the strength of the national primary care organisation.

Regression equations were evaluated by the proportional reduction of variance at the GP practice and country level. All analyses were performed using Stata version 14.0.

Results

The average response rate of GPs was 38%, varying from less than 10% in, for example, Austria and Sweden to more than 70% in Greece and Spain [22,23]. The mean scores per country of breadth of GP service profiles are presented in Appendix 6.

The national organisation of primary care

Table 1 presents the main results of the analyses on the relationship between the strength of the primary care structure in a country and the breadth of GP service profiles.

In countries with a pro-primary care governance, economic conditions, workforce development and an overall strong structure, GPs are more involved in first contact care and treatment of chronic diseases. GPs have broader services profiles in the area of technical procedures in countries with more pro-primary care economic conditions, workforce development and an overall stronger primary care organisation. The preventive activities of GPs are not associated with the strength of the national organisation of primary care.

Table 1 Summary results of separate linear multilevel regression analyses of country level characteristics

n_i=34 n_j= 7144	First contact care (n_i=34)	Treatment of chronic diseases (n_i=34)	Technical procedures (n_i=34)	Preventive services (n_i=34)
Governance	1.104 (0.343)**	0.687 (0.340)*	0.407 (0.798)	0.100 (0.139)
Economic conditions	0.825 (0.437)*	1.108 (0.378)**	1.513 (0.905)*	0.132 (0.163)
Workforce development	1.060 (0.236)**	0.880 (0.229)**	1.413 (0.558)**	-0.000 (0.107)
Overall national organisation	1.141 (0.228)**	0.920 (0.227)**	1.039 (0.588)*	0.064 (0.107)

* Significant at p<0.05

** Significant at p<0.1

Notes: Figures in table 1 are adjusted for background characteristics of GPs and the local organisation characteristics as presented in table 2.

The organisation of GP practices

In this section, we describe how the characteristics of the GP practice organisation are associated with the breadth of GP service profiles (Table 2). Three independent variables, community-oriented vision, the number of medical instruments and the provision of out-of-hours care within primary care only, are associated with broader GP service profiles in all areas. Other independent variables are associated with broader GP service profiles only in certain areas.

Regarding practice resources, GPs also have broader service profiles when they have a more comprehensive medical record system, but not in the area of technical procedures. When the medical record system is kept routinely, GPs offer more preventive services to their patients. GPs working in a duo or group practice have broader service profiles in the area of technical procedures than GPs working in solo practices. However, GPs working in solo practices offer more preventive services. No relation is found with the number of other disciplines in the GP practice and the breadth of the GP service profiles.

With regard to the structure, collaboration within primary care is positively associated with broader GP service profiles in all areas. Self-employed GPs have broader service profiles in the areas of first contact care, treatment of chronic diseases and technical procedures than GPs

working on a salaried basis. GPs offer more preventive services when they are working on both a self-employed status and on a salaried basis. Professional and administrative processes are also related to the breadth of GP service profiles. GPs with a walk-in hour have broader service profiles regarding first contact care.

The environment to the GP practice is significantly related to the curative services (first contact care and treatment of chronic diseases) and technical procedures; GPs have broader service profiles when they are working in more rural areas.

The reductions in variance due to the local organisational characteristics are also included in Table 2. Generally, the highest reductions are found at the country level. For preventive services, we found almost no reductions, indicating the local organisational factors are not relevant for preventive services.

Table 2 Summary results linear multi-level regression analyses GP practice level characteristics

	First contact care	Treatment of chronic diseases	Technical procedures	Preventive services
	<i>Countries: 34</i>	<i>Countries: 34</i>	<i>Countries: 34</i>	<i>Countries: 34</i>
	<i>Practices: 6,613</i>	<i>Practices: 6,608</i>	<i>Practices: 6,610</i>	<i>Practices: 6,621</i>
Vision				
Community orientation	0.090 (0.009)*	0.059 (0.009)*	0.049 (0.009)*	0.011 (0.003)*
Resources				
Duo/ group practice (Ref: solo)	-0.008 (0.013)	-0.010 (0.013)	0.043 (0.013)*	-0.012 (0.004)*
No. disciplines in the practice	0.001 (0.003)	-0.002 (0.003)	0.005 (0.003)	0.001 (0.001)
Medical instruments in the practice	0.010 (0.002)*	0.011 (0.002)*	0.035 (0.002)*	0.003 (0.001)*
Comprehensive med. record keeping	0.021 (0.003)*	0.023 (0.003)*	-0.004 (0.003)	0.006 (0.001)*
Routine med. record keeping	-0.003 (0.013)	0.014 (0.013)	-0.019 (0.013)	0.011 (0.004)*
Structure				
Employment status (Ref: salaried)				
- Self-employed	0.085 (0.017)*	0.091 (0.017)*	0.046 (0.018)*	0.006 (0.006)
- Mixed	-0.063 (0.054)	-0.034 (0.053)	-0.028 (0.054)	0.046 (0.018)*
Collaboration within PC	0.064 (0.021)*	0.134 (0.021)*	0.137 (0.021)*	0.032 (0.007)*

– Table 2 to be continued –

	First contact care	Treatment of chronic diseases	Technical procedures	Preventive services
	<i>Countries: 34</i>	<i>Countries: 34</i>	<i>Countries: 34</i>	<i>Countries: 34</i>
	<i>Practices: 6,613</i>	<i>Practices: 6,608</i>	<i>Practices: 6,610</i>	<i>Practices: 6,621</i>
Professional and administrative processes				
Walk-in hour (Ref: N)				
- Yes	0.042 (0.013)*	0.009 (0.013)	0.014 (0.014)	-0.000 (0.005)
OOH Care (ref: within PC only)				
- Other PC providers only	-0.064 (0.017)*	-0.041 (0.016)*	-0.060 (0.017)*	-0.002 (0.006)
- Also secondary care	-0.037 (0.015)*	-0.012 (0.015)	-0.097 (0.015)*	-0.012 (0.005)*
- Other arrangements	-0.052 (0.017)*	-0.069 (0.016)*	0.097 (0.017)*	0.001 (0.006)
Environment				
Practice location(Ref: Big city):				
- Suburbs or small town	0.047 (0.013)*	0.047 (0.013)*	0.057 (0.013)*	-0.001 (0.004)
- Mixed urban/rural	0.069 (0.014)*	0.064 (0.013)*	0.159 (0.014)*	0.007 (0.005)
Proportional reduction in variance <u>between</u> countries (compared to null model)				
	25%	26.4%	32.5%	0%

– Table 2 to be continued –

	First contact care	Treatment of chronic diseases	Technical procedures	Preventive services
	<i>Countries: 34</i>	<i>Countries: 34</i>	<i>Countries: 34</i>	<i>Countries: 34</i>
	<i>Practices: 6,613</i>	<i>Practices: 6,608</i>	<i>Practices: 6,610</i>	<i>Practices: 6,621</i>
Proportional reduction in variance <u>within</u>				
countries (<i>compared to null model</i>)	6.9%	7.7%	16.0%	1.1%

* significant at $p < 0.05$; Note: in all models we adjusted for background characteristics GPs and overall strength primary care structure. The coefficients of the dummies for the missing values are omitted from this table as they are not significant.

Discussion

Various characteristics of the national primary care organisation and local organisation of the GP practice are significantly related to the four components of GP service profiles. As we hypothesized, a pro-primary care national organisation is positively associated with first contact care, treatment of diseases and technical procedures. Previous studies found that the delivery of a wide range of services is improved by primary care-supportive governmental policies [3] and that poor financial investment forms a barrier to delivery of PC [11-24]. Preventive services, however, are not associated with the national primary care structure. Based on previous analyses comparing GP service profiles between 1993 and 2012, it was already found that various national characteristics could explain the changes in the breadth of GP service profiles, but not for preventive services [25].

At the local level, the practice organisation also shows associations with the breadth of service profiles. As expected, community orientation is associated with broader service profiles regarding first contact care and prevention. In addition, we found a positive association with treatment of chronic diseases and technical procedures. The resources in a practice appear to be especially important for the involvement of GPs in preventive services. It was hypothesized that a higher number of medical instruments is important for first contact care, treatment of chronic diseases and technical procedures. This was confirmed and, additionally, we found a positive association with preventive services. The positive association between service profiles and equipment was also found in the 1993 study [14]. Indeed, when a medical record system is comprehensive and when it is kept routinely, GPs are more involved in prevention. This confirms that the medical record system can be of support in performing such tasks. Additionally, in practices with more comprehensive medical records, GPs are more involved in the other areas of primary care as well.

We could not confirm that the skill mix of the practice is associated with broader service profiles, but GP service profiles are broader when there is actual collaboration between the GP and other primary care disciplines. In previous analyses on the QUALICPOPC data from New Zealand and Canada, positive associations were found between the

number of other disciplines and specific items of treatment of chronic diseases [26]. This study did not take into account actual collaboration between GPs and other primary care providers. It may be that there is an interaction between these two variables, but this was not studied.

Additionally, in duo/group practices more technical procedures are carried out than in solo practices, while more preventive services are carried out in solo practices. GPs in Germany, Slovenia and Greece often work in solo practices and on average have a broad service profile in this area compared to GPs in other countries.

With regard to practice structure, we could confirm that self-employment of GPs is associated with broader service profiles regarding the treatment of chronic diseases, but also for first contact care and technical procedures. Preventive activities are – on the other hand – positively associated with a mixed employment status.

Regarding administrative processes, we could confirm that better accessibility through a walk-in-hour is associated with more involvement in first contact care. Additionally, GPs who offer out-of-hours care themselves have broader service profiles in all areas. As in the 1993 GP Task Profile Study, we found that the environment (i.e. practice location) is important, because GP service profiles are broader in more rural areas [14], even though this was not confirmed for preventive care.

Generally, it can be concluded that preventive services are related to different national and local organisational aspects than the other areas of service profiles. No relation was found with the national primary care organisation. A possible explanation could be that the PHAMEU study did not take enhancing conditions for prevention in the measurement of the national primary care organisation. Currently, GPs' involvement in preventive services is rather low in most countries, even though this is expected to become an important activity of GPs due to the changes in the demographic situation in the countries studied. For example, the relative and absolute increase in frail elderly populations requires proactive primary care to ensure that their health needs are appropriately met. Therefore, it is important that the current view of what a primary care structure entails is re-evaluated and possibly broadened with preventive enhancing components. Furthermore, this study showed that the use of appropriately kept medical records IT can support GPs in carrying out these tasks. Currently, various countries, mainly in southern

and eastern Europe, have a high potential for improvement in the area of IT services in GP practices [27].

A strong point of this study is that large samples of GPs in many countries have been surveyed systematically about the services they deliver. Associations with various organisational characteristics at the level of the practice could be tested. Due to the sampling strategy, multilevel modelling could be used to distinguish between country and GP practice level variance [13]. A possible weakness is that response rates among GPs were low in some countries, indicating a selection bias of GPs [28,29]. Also, there are countries where, besides GPs, also other providers offer primary care. These providers were not included in this study [21]. Finally, in Greece mainly the GPs working in health centres responded, which is a selection of GPs in Greece [30].

References

- 1 Starfield B. Comprehensiveness of care: Who should provide what. Primary care: Balancing health needs, services, and technology. Oxford, New York: Oxford University Press, 1998.
- 2 Kringos DS, Boerma W, Van der Zee J, et al. Europe's strong primary care systems are linked to better population health but also to higher health spending. *Health Aff(Millwood)* 2013;32(4):686-94 doi: 32/4/686 [pii];10.1377/hlthaff.2012.1242 [doi][published Online First: Epub Date].
- 3 Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q* 2005;83(3):457-502 doi: MILQ409 [pii];10.1111/j.1468-0009.2005.00409.x [doi][published Online First: Epub Date].
- 4 Sans-Corrales M, Pujol-Ribera E, Gene-Badia J, et al. Family medicine attributes related to satisfaction, health and costs. *Family practice* 2006;23(3):308-16 doi: 10.1093/fampra/cmi112 [published Online First: Epub Date].
- 5 Wilhelmsson S, Lindberg M. Prevention and health promotion and evidence-based fields of nursing - a literature review. *International journal of nursing practice* 2007;13(4):254-65 doi: 10.1111/j.1440-172X.2007.00635.x[published Online First: Epub Date].
- 6 Starfield B. State of the art in research on equity in health. *Journal of health politics, policy and law* 2006;31(1):11-32 doi: 10.1215/03616878-31-1-11[published Online First: Epub Date].
- 7 Schäfer WLA, Boerma WGW, Schellevis FG, et al. GP practices as a one stop shop: how do patients perceive the quality of care? Submitted 2016.
- 8 Van Loenen T, Faber MJ, Westert GP, et al. The impact of primary care organization on avoidable hospital admissions for diabetes in 23 countries. *Scandinavian journal of primary health care* 2016;34(1):5-12 doi: 10.3109/02813432.2015.1132883 [published Online First: Epub Date].
- 9 Grielen SJ, Boerma WGW, Groenewegen PP. Unity or diversity? Task profiles of general practitioners in Central and Eastern Europe. *EurJPublic Health* 2000(10):249-54.

- 10 Boerma WG, Van der Zee J, Fleming DM. Service profiles of general practitioners in Europe. European GP Task Profile Study. *BrJGenPract* 1997;47(421):481-86.
- 11 Kringos DS, Boerma WG, Hutchinson A, et al. The breadth of primary care: a systematic literature review of its core dimensions. *BMCHHealth ServRes* 2010;10:65 doi: 1472-6963-10-65 [pii];10.1186/1472-6963-10-65 [doi][published Online First: Epub Date].
- 12 Boerma WG, Fleming DM. The role of general practice in primary health care. Norwich: The Stationery Office on behalf of the World Health Organization, 1998.
- 13 Schäfer WLA, Boerma WG, Spreeuwenberg P, Schellevis FG, Groenewegen PP. Two decades of change in European general practice service profiles: conditions explaining the developments in 28 countries between 1993 and 2012. Submitted 2014.
- 14 Boerma WG, Groenewegen PP, Van der Zee J. General practice in urban and rural Europe: the range of curative services. *Social science & medicine* 1998;47(4):445-53.
- 15 Kringos DS. The importance of measuring and improving the strength of primary care in Europe: results of an international comparative study. *Türk Aile Hek Derg* 2013;17(4):14.
- 16 Lamarche PA, Beaulieu MD, Pineault R, et al. Choices for Change: The Path for Restructuring Primary Healthcare Services in Canada. Ontario, Canada: Canadian Health Services Research Foundation, 2003.
- 17 Borges Da Silva R, Pineault R, Hamel M, et al. Constructing taxonomies to identify distinctive forms of primary healthcare organizations. *ISRN family medicine* 2013;2013:798347 doi: 10.5402/2013/798347[published Online First: Epub Date].
- 18 Schäfer WLA, Boerma WG, Kringos DS, et al. QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care. *BMCFamPract* 2011;12:115 doi: 1471-2296-12-115 [pii];10.1186/1471-2296-12-115 [doi][published Online First: Epub Date].

- 19 Schäfer WLA, Boerma WGW, Kringos DS, et al. Measures of quality, costs and equity in primary health care: Instruments developed to analyse and compare primary health care in 35 countries. *QualPrimCare* 2013;21(2):67-79.
- 20 Kringos DS, Boerma WG, Bourgueil Y, et al. The European primary care monitor: structure, process and outcome indicators. *BMCFamPract* 2010;11:81 doi: 1471-2296-11-81 [pii];10.1186/1471-2296-11-81 [doi][published Online First: Epub Date].
- 21 Schäfer WLA, Boerma WGW, Murante AM, et al. Assessing the potential for improvement of primary care in 34 countries: a cross-sectional survey. *Bulletin of the World Health Organization* 2015;93(3):161-8 doi: 10.2471/BLT.14.140368[published Online First: Epub Date].
- 22 Groenewegen PP, Greß S, Schäfer W. General practitioners' participation in a large, multi-country combined general practitioner – patient survey: recruitment procedures and participation rate. *International Journal of Family Medicine* 2016;2016:1-9.
- 23 Wong ST, Chau LW, Hogg W, et al. An international cross-sectional survey on the Quality and Costs of Primary Care (QUALICO-PC): recruitment and data collection of places delivering primary care across Canada. *BMC family practice* 2015;16:20 doi: 10.1186/s12875-015-0236-7[published Online First: Epub Date].
- 24 Nelson BD, Simic S, Beste L, et al. Multimodal assessment of the primary healthcare system of Serbia: a model for evaluating post-conflict health systems. *Prehospital and disaster medicine* 2003;18(1):6-13.
- 25 Schäfer WLA, Boerma WGW, Spreeuwenberg P, et al. Two decades of change in European general practice service profiles: conditions associated with the developments in 28 countries between 1993 and 2012. *Scandinavian journal of primary health care* 2016;34(1):97-110 doi: 10.3109/02813432.2015.1132887 [published Online First: Epub Date].

- 26 Rumball-Smith J, Wodchis WP, Kone A, et al. Under the same roof: co-location of practitioners within primary care is associated with specialized chronic care management. *BMC family practice* 2014;15:149 doi: 10.1186/1471-2296-15-149[published Online First: Epub Date].
- 27 De Rosis S, Seghieri C. Basic ICT adoption and use by general practitioners: an analysis of primary care systems in 31 European countries. *BMC medical informatics and decision making* 2015;15:70 doi: 10.1186/s12911-015-0185-z [published Online First: Epub Date].
- 28 Groenewegen PP; Greß S; Schäfer WLA. Participation of general practitioners in a large multi-country combined general practitioner – patient survey. Paper to be submitted 2014.
- 29 Parkinson A, Jorm L, Douglas KA, et al. Recruiting general practitioners for surveys: reflections on the difficulties and some lessons learned. *Australian journal of primary health* 2014 doi: 10.1071/PY13129[published Online First: Epub Date].
- 30 Schäfer WLA, Boerma WGW, Murante AM, et al. Enhancing person-focused primary care: the patient perceived improvement potential in Europe, Australia, Canada and New Zealand Paper under review 2014.

Appendices

Appendix 1 Research hypotheses

Characteristics of the national organisation

Hypothesis 1: GPs will have broader service profiles in countries with a pro-primary care national organisation in a country.

The national primary care organisation can support GPs in having broad service profiles, e.g. by means of pro-primary care economic conditions. The role of GPs can be supported by, for example, paying GPs to provide a broad range of services.

Characteristics of the local practice organisation

Hypothesis 2: GPs will have broader service profiles in the area of first contact care when:

- conditions for the accessibility of their practice are favourable, due to more resources available in their practice [14] and better organisational processes facilitating accessibility and availability of care;
- the GP has a more community-oriented vision.

Hypothesis 3a: GPs will have broader services profiles in the area of treatment of chronic diseases when there is a higher availability of human resources.

GPs who are working with supporting staff have the opportunity to delegate tasks, e.g. administrative tasks, and pay more attention to the treatment of patients [31,32].

Hypothesis 3b: GPs will have broader services profiles in the area of treatment of chronic diseases when they are paid according to the volume of services provided, which is more likely if they work on a self-employed basis instead of on a salaried basis.

Even though economic gain may not be the first aim of GPs, self-employed GPs have better opportunities to maximise profits by behaving entrepreneurially compared to salaried GPs [33].

Hypothesis 4: GPs will have broader service profiles in the area of minor technical procedures, when they have a higher availability of technical and human resources.

As with the treatment of chronic diseases, the availability of human resources is expected to promote the carrying out such services. Other providers can make GPs more aware of the possibility to carry out

certain procedures. Also, the available equipment can enable and motivate GPs to provide these services [12].

Hypothesis 5: GPs will have broader service profiles related to preventive services, when they have:

- *a more comprehensive medical record system where records are kept routinely;*
- *and a more community oriented vision.*

Preventive services include health education and health check-ups. These services can be enhanced by the availability of a good medical record system, as this can support a GP through its functionality of identifying and monitoring patient groups at risk [12 34]. The medical record system can also be used in monitoring individual patients with chronic diseases [34]. It is important that medical records are of high quality, contain the necessary information and are kept routinely to support such tasks. GPs with a more community-oriented vision are expected to also feel responsible for prevention than GPs who primarily concentrate on treating the patients who visit them without feeling responsible for the entire local community.

Appendix 2 Calculation of scales and content of dependent variables

Scale scores were calculated using econometric analyses. This accounts for differences in the number of respondents on which the estimation is based, individual differences in response to certain items, and for dependency among the items that measure the latent variable [35]. In the multilevel model an additional level is added for the related variables, or items, of which the scale is composed. A three level model was used (items nested within GPs, and GPs nested within countries). A weighted item average was used for each item to calculate an average scale value. This was done by using the item weights for the fixed effects. Finally, the item variance, an indication of the measurement error, was taken into account [35,36].

Table 1 Reliability of scales at GP practice and country level

Scale	GP practice level	Country level
First contact of care	0.86	0.98
Treatment of chronic diseases	0.86	0.98
Technical procedures	0.75	1.00
Prevention	0.61	0.97

Box 1 Content of scales GP service profile

<p>First contact care</p> <p>1. Child with severe cough; 2. Child aged 8 with hearing problem; 3. Woman aged 18 asking for oral contraception; 4. Man aged 24 with stomach pain; 5. Man aged 45 with chest pain; 6. Woman aged 50 with a lump in her breast; 7. Woman aged 60 with deteriorating vision; 8. Woman aged 60 with polyuria; 9. Woman aged 60 with acute symptoms of paralysis/paresis; 10. Man aged 70 with joint pain; 11. Woman aged 75 with moderate memory problems; 12. Man aged 35 with sprained ankle; 13. Man aged 28 with a first convulsion; 14. Anxious man aged 45; 15. Physically abused child aged 13 ; 16. Couple with relationship problems; 17. Woman aged 50 with psycho-social problems; 18. Man aged 32 with sexual problems; 19. Man aged 52 with alcohol addiction problems.</p> <p style="text-align: right;">– Box 1 to be continued –</p>

Treatment of chronic diseases

1. Chronic bronchitis/ COPD; 2. Hordeolum (Stye); 3. Peptic ulcer; 4. Herniated disc lesion; 5. Congestive heart failure; 6. Pneumonia; 7. Peritonsillar abscess; 8. Parkinson's disease; 9. Uncomplicated diabetes (type II); 10. Rheumatoid arthritis; 11. Depression; 12. Myocardial infarction.

Technical procedures

1. Wedge resection of ingrown toenail; 2. Removal of sebaceous cyst from the hairy scalp; 3. Wound suturing; 4. Excision of warts; 5. Insertion of IUD; 6. Fundoscopy ; 7 Joint injection; 8. Strapping an ankle; 9. Cryotherapy (warts); 10. Setting up an intravenous infusion.

Prevention

1. Measurement of blood pressure; 2. Measurement of blood cholesterol level; 3. Health education on smoking; 4. Health education on diet; 5. Health education on problematic use of alcohol.

Appendix 3 Scale and sum scores

3.1 Content and reliability scale scores based on ecometrics

Community orientation

Reliability of scale:

- Country level: 0.9443

- GP level: 0.8379

58. If you were confronted through your patient contacts with the following occurrences, would you report this (for instance to an authority)?	Yes	Probably Yes	Probably Not	No	Don't know
1. Repeated accidents in an industrial setting;	<input type="checkbox"/>				
2. Frequent respiratory problems in patients living near a certain industry;	<input type="checkbox"/>				
3. Repeated cases of food poisoning among people living in a certain district.	<input type="checkbox"/>				

Face-to-face meetings with other professionals

Reliability of scale:

- Country level: 0.970

- GP practice level: 0.664

Questions used for scale

How often do you meet face-to-face with the following professionals (either professionally or socially):	Seldom or never	Every 1-3 months	More than once a month
1. Other GP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Practice nurse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Ambulatory medical specialist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Hospital medical specialist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Pharmacist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Home care nurse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Midwife	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Physiotherapist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Social worker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Dietician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2 Content of sum scores

Number of other professionals in the practice

Question used for scale:

Which of the following disciplines are working in your practice/centre?	Yes
1. Receptionist/med. secretary	<input type="checkbox"/>
2. Practice nurse	<input type="checkbox"/>
3. Community / home care nurse	<input type="checkbox"/>
4. Psychiatric nurse	<input type="checkbox"/>
5. Nurse practitioner	<input type="checkbox"/>
6. Assistant for laboratory work	<input type="checkbox"/>
7. Manager of the centre or practice (not a physician)	<input type="checkbox"/>
8. Midwife	<input type="checkbox"/>
9. Physiotherapist	<input type="checkbox"/>
10. Dentist	<input type="checkbox"/>
11. Pharmacist	<input type="checkbox"/>
12. Social worker	<input type="checkbox"/>

Number of medical instruments

Question used for scale:

Please tick the equipment used in your practice by yourself or your staff:	<u>Functions</u>
<u>Laboratory</u>	<input type="checkbox"/> Audiometer
<input type="checkbox"/> Hemoglobinometer	<input type="checkbox"/> Bicycle ergometer
<input type="checkbox"/> Any blood glucose test set	<input type="checkbox"/> Eye tonometer
<input type="checkbox"/> Any cholesterol meter	<input type="checkbox"/> Peak flow/ PEF meter
<input type="checkbox"/> Blood cell counter	<input type="checkbox"/> Spirometer
<u>Imaging</u>	<input type="checkbox"/> Electrocardiograph
<input type="checkbox"/> Ophthalmoscope	<input type="checkbox"/> Blood pressure meter
<input type="checkbox"/> Proctoscope	<input type="checkbox"/> Infusion set
	<input type="checkbox"/> Doctor's bag for emergencies and home visits

<input type="checkbox"/> Otoscope <input type="checkbox"/> Gastroscope <input type="checkbox"/> Sigmoidoscope <input type="checkbox"/> X-ray <input type="checkbox"/> Ultrasound for abdomen/ fetus <input type="checkbox"/> Microscope	<u>Other</u> <input type="checkbox"/> Urine catheter <input type="checkbox"/> Coagulometer <input type="checkbox"/> Set for minor surgery <input type="checkbox"/> Suture set <input type="checkbox"/> Defibrillator <input type="checkbox"/> Disposable syringes <input type="checkbox"/> Disposable gloves <input type="checkbox"/> Refrigerator for medicines <input type="checkbox"/> Resuscitation equipment
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The comprehensiveness of the medical record system

Question used for scale:

Do your medical files normally include the following information: (Tick all that apply)	<input type="checkbox"/> Living situation <input type="checkbox"/> Ethnicity <input type="checkbox"/> Patients' family history (e.g. depression, cancer) <input type="checkbox"/> Patients' weight and height <input type="checkbox"/> Smoking <input type="checkbox"/> Blood pressure <input type="checkbox"/> Reason for encounter <input type="checkbox"/> Diagnosis <input type="checkbox"/> Prescribed medications <input type="checkbox"/> Test results
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Appendix 4 Content of structure dimensions

The data on the dimensions of the structure of primary care were derived from the PHAMEU database. In this study data were collected on a set of indicators in 31 countries for each dimension of the primary care structure (governance, economic conditions and workforce developments). Examples of such indicators are the availability of evidence based guidelines for GPs (governance) and the percentage of medical universities with a postgraduate programme in family medicine (workforce development) [20]. The PHAMEU database provides scores indicating the strength of each indicator, ranging from 1 (weak) to 3 (strong) and overall scale scores for each dimension, calculated using a two-level hierarchical latent regression model, and an overall structure score combining the three dimensions [37]. As the PHAMEU database includes data from 30 European countries. We collected additional data for Australia, Canada, New Zealand and FYR Macedonia during the time of the QUALICOPC project using identical methods as the PHAMEU study.

Appendix 5 Overview variables, mean values per country

Table 1 Overview independent variables, mean values per country

Country N= 7,144	Age	Gender (Female)	Community orientation <i>(Scale: 1-4)</i>	Pers. focused orientation <i>(Scale: 0-1)</i>	Disciplines in practice <i>(max. 12)</i>	No of medical instruments <i>(max. 31)</i>	Compr. Med. record <i>(max . 10)</i>	Routine record keeping	Employment (% salaried)	Walk-in hour %	Practice location (% big city)	Distance secondary % <10 km
Austria	54.3	30.3%	3.3	0.71	1.4	15.6	7.8	95.1%	0.6%	81.3%	34.3%	85.7%
Belgium	49.2	37.6%	3.3	0.79	0.7	12.8	8.3	81.7%	5.4%	61.8%	21.4%	83.5%
Bulgaria	50.5	63.2%	3.3	0.55	1.4	11.3	7.1	55.4%	23.2%	56.6%	49.8%	83.1%
Cyprus	47.9	49.3%	2.6	0.26	5.3	12.1	7.8	71.8%	85.7%	91.3%	76.1%	84.5%
Czech Rep.	51.8	69.9%	3.2	0.57	1.2	10.9	8.3	76.3%	10.1%	100.0%	27.1%	90.4%
Denmark	53.1	43.4%	3.3	0.78	1.9	18.5	8.2	75.5%	0.5%	25.1%	26.7%	70.3%
Estonia	50.8	90.6%	2.6	0.61	2.3	14.4	7.7	42.6%	17.8%	24.0%	43.4%	74.0%
Finland	44.9	71.9%	3.3	0.60	6.9	22.3	8.2	72.9%	91.8%	32.0%	16.3%	65.9%
Germany	53.9	36.1%	3.1	0.71	1.3	16.6	8.7	97.9%	2.2%	75.5%	23.5%	88.2%
Greece	43.5	45.9%	3.5	0.56	2.9	14.7	6.9	17.1%	91.2%	92.9%	5.9%	33.2%

– Appendix 5 to be continued –

Country N= 7,144	Age	Gender (Female)	Community orientation <i>(Scale: 1-4)</i>	Pers. focused orientation <i>(Scale: 0-1)</i>	Disciplines in practice <i>(max. 12)</i>	No of medical instruments <i>(max. 31)</i>	Compr. Med. record <i>(max . 10)</i>	Routine record keeping	Employment (% salaried)	Walk-in hour %	Practice location (% big city)	Distance secondary % <10 km
Hungary	53.4	46.9%	2.9	0.66	1.5	11.9	7.9	70.9%	4.5%	60.6%	31.2%	68.0%
Iceland	54.5	27.5%	3.4	0.76	5.1	20.3	6.8	93.7%	87.5%	95.0%	38.0%	80.0%
Ireland	50.6	33.7%	3.2	0.71	3.4	16.2	8.0	97.6%	5.4%	36.4%	8.6%	47.9%
Italy	57.1	37.6%	3.5	0.79	1.0	8.9	8.4	45.5%	11.4%	74.5%	25.6%	88.0%
Latvia	52.0	88.5%	3.1	0.62	2.5	13.5	8.2	63.3%	14.3%	96.8%	41.9%	78.2%
Lithuania	51.2	88.4%	3.3	0.50	7.7	19.0	7.5	41.6%	90.8%	99.1%	84.7%	87.2%
Luxembourg	49.0	35.6%	3.3	0.75	1.0	13.1	8.9	93.3%	2.8%	82.7%	13.7%	69.3%
Malta	46.8	29.0%	3.4	0.49	2.7	13.8	6.9	45.7%	43.5%	92.9%	12.9%	82.6%
Netherlands	53.0	28.3%	3.4	0.70	3.9	16.9	8.0	98.7%	4.3%	15.3%	17.2%	81.0%
Norway	45.7	39.1%	3.6	0.68	2.1	20.7	8.6	98.0%	7.1%	86.6%	33.9%	70.9%

– Appendix 5 to be continued –

Country N= 7,144	Age	Gender (Female)	Community orientation (Scale: 1-4)	Pers. focused orientation (Scale: 0-1)	Disciplines in practice (max. 12)	No of medical instruments (max. 31)	Compr. Med. record (max . 10)	Routine record keeping	Employment (% salaried)	Walk-in hour %	Practice location (% big city)	Distance secondary % <10 km
Poland	49.5	63.6%	3.3	0.48	4.0	14.0	7.7	90.8%	35.7%	34.9%	30.0%	79.3%
Portugal	51.3	59.7%	3.1	0.79	3.2	11.4	8.9	73.0%	96.7%	96.7%	14.2%	70.0%
Romania	52.0	83.2%	3.3	0.74	1.4	9.6	8.2	61.8%	5.5%	98.2%	33.6%	66.8%
Slovakia	52.6	67.9%	3.3	0.37	1.3	9.8	6.2	34.0%	17.9%	42.7%	18.5%	84.4%
Slovenia	48.8	76.1%	3.3	0.61	4.1	15.2	8.4	79.2%	74.4%	46.2%	36.2%	72.1%
Spain	49.7	63.1%	3.4	0.66	6.1	17.4	9.0	43.2%	99.0%	98.4%	46.3%	85.8%
Sweden	52.0	54.6%	3.1	0.49	5.6	21.2	9.3	96.9%	85.6%	35.8%	15.5%	58.5%
Switzerland	55.0	22.1%	3.3	0.82	1.3	21.1	9.4	87.4%	4.0%	17.2%	19.3%	86.9%
Turkey	44.0	30.7%	3.6	0.43	2.4	12.8	6.7	76.0%	93.2%	93.2%	73.7%	90.9%
England	46.6	37.9%	3.4	0.52	5.2	15.5	9.1	97.0%	13.0%	24.9%	15.9%	74.4%
Australia	52.7	35.8%	3.2	0.76	3.6	16.3	9.2	95.3%	21.0%	73.7%	13.4%	74.5%
Canada	48.8	48.4%	3.2	0.78	3.1	11.7	8.7	96.6%	10.3%	96.1%	29.9%	78.7%

– Appendix 5 to be continued –

Country N= 7,144	Age	Gender (Female)	Community orientation (Scale: 1-4)	Pers. focused orientation (Scale: 0-1)	Disciplines in practice (max. 12)	No of medical instruments (max. 31)	Compr. Med. record (max . 10)	Routine record keeping	Employment (% salaried)	Walk-in hour %	Practice location (% big city)	Distance secondary % <10 km
New Zealand FYR	53.1	38.3%	3.4	0.78	3.9	17.4	9.4	95.8%	19.3%	33.3%	16.1%	75.0%
Macedonia	45.7	83.9%	3.3	0.70	1.5	9.7	7.7	52.1%	28.9%	43.9%	54.9%	83.5%

Table 1 Country level characteristics

Country	Gate-keeping	Structure	Governance	Economic conditions	Workforce development
Austria	No	2.2436	2.4763	2.173	1.9936
Belgium	No	2.2317	2.3865	2.2556	2.0494
Bulgaria	Yes	2.1392	2.4464	1.8764	1.9904
Cyprus	No	1.966	2.1952	2.0482	1.9431
Czech Rep.	No	2.1604	2.4394	2.0588	1.9558
Denmark	No	2.3875	2.5188	2.1507	2.2458
Estonia	Yes	2.3049	2.5167	2.1013	2.1046
Finland	No	2.3059	2.3748	2.2522	2.2224
Germany	No	2.1735	2.3776	2.1644	2.0063
Greece	No	2.2222	2.4172	2.2162	2.0091
Hungary	Yes	2.1194	2.4498	2.0649	1.9069
Iceland	No	2.0964	2.238	2.1395	2.0635
Ireland	Yes	1.8366	2.32	2.0153	1.6034
Italy	Yes	2.1799	2.2704	1.9595	2.2358
Latvia	Yes	2.3357	2.5281	2.2019	2.0863
Lithuania	Yes	2.1682	2.462	2.116	1.8863
Luxembourg	No	2.2762	2.4854	2.1116	2.0917
Malta	No	1.9415	2.1935	2.0845	1.838
Netherlands	Yes	2.1361	2.2724	2.0503	2.1753
Norway	Yes	2.4906	2.5865	2.249	2.3006
Poland	No	2.273	2.5089	2.0885	2.0562
Portugal	Yes	2.1409	2.3783	2.097	1.984
Romania	Yes	2.4053	2.5388	2.1606	2.2414
Slovakia	No	2.3099	2.5139	2.184	2.0661
Slovenia	Yes	2.0545	2.295	2.1434	1.885
Spain	Yes	2.3672	2.5139	2.2316	2.1524
Sweden	Yes	2.4335	2.5556	2.2703	2.2122
Switzerland	No	2.2518	2.4621	2.1447	2.0584
Turkey	No	2.0459	2.1163	2.1644	2.1063
England	Yes	2.2849	2.4717	2.1895	2.0696
Australia	Yes	2.5129	2.5446	2.3482	2.3391
Canada	Yes	2.341	2.4893	2.2301	2.132
New Zealand	Yes	2.3564	2.4228	2.1821	2.2927
FYR Macedonia	No	2.3694	2.4291	2.3482	2.2147

Table 2 Dependent variables mean values per country

	First contact care	Treatment of chronic diseases	Technical procedures	Preventive care
Austria	2.78	3.33	2.06	0.30
Belgium	3.02	3.34	2.37	0.17
Bulgaria	2.97	3.15	1.76	0.21
Cyprus	2.10	2.83	1.26	0.23
Czech Republic	2.43	2.70	1.40	0.23
Denmark	3.38	3.55	2.54	0.07
Estonia	2.73	3.22	1.55	0.28
Finland	2.73	3.27	3.31	0.08
Germany	2.82	3.47	1.83	0.36
Greece	2.68	3.01	2.43	0.35
Hungary	2.70	3.36	1.37	0.15
Iceland	2.69	2.98	2.89	0.09
Ireland	3.25	3.59	2.68	0.20
Italy	2.86	3.37	1.39	0.07
Latvia	2.64	3.21	1.43	0.16
Lithuania	3.11	2.93	1.28	0.30
Luxembourg	2.68	3.10	2.08	0.16
Malta	2.82	2.89	2.20	0.06
Netherlands	3.36	3.37	3.29	0.15
Norway	3.21	3.51	3.12	0.11
Poland	2.65	3.20	1.33	0.07
Portugal	3.05	3.30	1.78	0.16
Romania	2.88	3.31	1.43	0.12
Slovakia	2.60	2.61	1.30	0.25
Slovenia	3.00	3.65	1.67	0.36
Spain	3.15	3.50	2.21	0.23
Sweden	3.40	3.57	2.99	0.13
Switzerland	2.90	3.45	2.58	0.23
Turkey	2.41	2.76	1.75	0.08
England	3.29	3.57	2.64	0.40
Australia	3.09	3.47	2.89	0.14
Canada	3.12	3.55	2.65	0.17
New Zealand	3.18	3.61	3.22	0.26
FYR Macedonia	3.06	3.36	1.28	0.21

Appendix 6 First contact care

n _i =34 n _j = 7,183	Null Model n _i =34 n _j =7,057	Null model + National organisation n _i =34, n _j =7,057	Model 1 Governance n _i =34 n _j = 6,613
Cons	2.904 (0.051)**	0.159 (0.584)	-0.598 (0.831)
National organisation			
Governance			1.104 (0.343)**
Economic conditions			
Workforce			
Overall national structure		1.229 (0.261)**	
Background			
Age (centered)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Sex (Female) (Ref: male)	0.002 (0.011)	0.002 (0.011)	0.025 (0.011)**
Vision			
Community orientation			0.089 (0.009)**
Resources			
Duo/ group practice (Ref: solo)			-0.008 (0.013)
No. disciplines in the practice			0.001 (0.003)
Medical instruments in the practice			0.010 (0.002)**
Comprehensive med. record keeping			0.022 (0.003)**
Routine med. record keeping			-0.003 (0.013)
Structure			0.086 (0.018)**
Employment status (Ref: salaried)			-0.063 (0.054)
- Self-employed			0.063 (0.021)**
- Mixed			
Collaboration within PC			
Professional and administrative processes			0.041 (0.014)**
Walk-in hour (Ref: N)			-0.040 (0.053)
- Yes			
- Missing values (dummy)			-0.064 (0.017)**
OOH Care (ref: within PC only)			-0.037 (0.015)**
- Other PC providers only			-0.052 (0.017)**
- Also secondary care			-0.001 (0.060)
- Other arrangements			
- Missing values (dummy)			

– Appendix 6 to be continued –

n _i =34 n _j = 7,183	Null Model n _i =34 n _j =7,057	Null model + National organisation n _i =34, n _j =7,057	Model 1 Governance n _i =34 n _j = 6,613
Environment			
Practice location(Ref: Big city):			
- Suburbs or small town			0.047 (0.013)**
- Mixed urban/rural			0.069 (0.014)**
Variance <u>between</u> countries (s.e.)	0.087 (0.021)**	0.052 (0.013)**	0.053 (0.013)**
Variance <u>within</u> countries (s.e.)	0.174 (0.003)**	0.174 (0.003)**	0.162 (0.003)**
ICC	33.2%	23%	24.5%

*significant at p<0.10 ** significant at p<0.05

n _i =34 n _j = 7,183	Model 2 Economic conditions n _i =34 n _j = 6,613	Model 3 Workforce development n _i =34 n _j =6,613	Model 4 Structure n _i =34 n _j =6,613
Cons	0.302 (0.943)	-0.121 (0.492)	-0.473 (0.513)
National organisation			
Governance			
Economic conditions	0.825 (0.437)*		
Workforce		1.060 (0.236)**	
Overall national structure			1.141 (0.228)**
Background			
Age (centered)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Sex (Female) (Ref: male)	0.026 (0.011)**	0.026 (0.011)**	0.026 (0.011)**
Vision			
Community orientation	0.090(0.009)**	0.090(0.009)**	0.090(0.009)**
Resources			
Duo/ group practice (Ref: solo)	-0.008 (0.013)	-0.008 (0.013)	-0.008 (0.013)
No. disciplines in the practice	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)
Medical instruments in the practice	0.009 (0.002)**	0.010 (0.002)**	0.010 (0.002)**
Comprehensive med. record keeping	0.022 (0.003)**	0.021 (0.003)**	0.021 (0.003)**
Routine med. record keeping	-0.004 (0.013)	-0.004 (0.013)	-0.003 (0.013)
Structure			
Employment status (Ref: salaried)			

– Appendix 6 to be continued –

n _i =34 n _j = 7,183	Model 2 Economic conditions n _i =34 n _j = 6,613	Model 3 Workforce development n _i =34 n _j =6,613	Model 4 Structure n _i =34 n _j =6,613
- Self-employed	0.085 (0.018)**	0.084 (0.018)**	0.085 (0.017)**
- Mixed	-0.064 (0.054)	-0.065 (0.054)	-0.063 (0.054)
Collaboration within PC	0.064 (0.021)**	0.063 (0.021)**	0.064 (0.021)**
Professional and administrative processes Walk-in hour (Ref: N)			
- Yes	0.042 (0.014)**	0.043 (0.014)**	0.042 (0.013)**
- Missing values (dummy)	-0.039 (0.053)	-0.037 (0.053)	-0.038 (0.053)
OOH Care (ref: within PC only)			
- Other PC providers only	-0.064 (0.017)**	-0.064 (0.017)**	-0.064 (0.017)**
- Also secondary care	-0.036 (0.015)**	-0.036 (0.015)**	-0.037 (0.015)**
- Other arrangements	-0.051 (0.017)**	-0.052 (0.017)**	-0.052 (0.017)**
- Missing values (dummy)	-0.001 (0.060)	-0.000 (0.060)	-0.001 (0.060)
Environment			
Practice location(Ref: Big city):			
- Suburbs or small town	0.046 (0.013)**	0.046 (0.013)**	0.047 (0.013)**
- Mixed urban/rural	0.069 (0.014)**	0.069 (0.014)**	0.069 (0.014)**
Variance <u>between</u> countries (s.e.)	0.063 (0.016)**	0.043 (0.011)**	0.039 (0.010)**
Variance <u>within</u> countries (s.e.)	0.162 (0.002)**	0.162 (0.003)**	0.162 (0.003)**
ICC	27.9%	20.9%	19.5%

Appendix 7 Treatment of chronic diseases

Table 1 Detailed results linear random intercept multilevel analyses treatment of chronic diseases

n _i =34 n _j = 7,183	Null Model n _i =34 n _j =7,049	Null model + National organisation n _i =34 n _j =7,049	Model 1 Governance n _i =34 n _j =6,608
Cons	3.278 (0.048)**	0.987 (0.589)*	0.731 (0.826)
National organisation			
Governance			0.687 (0.340)*
Economic conditions			
Workforce			
Overall national structure		1.026 (0.263)**	
Background			
Age (centered)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Sex (Female) (Ref: male)	-0.020 (0.011)	-0.020 (0.011)	-0.020 (0.011)
Vision			
Community orientation			0.059 (0.009)**
Resources			
Duo/ group practice (Ref: solo)			-0.010 (0.013)
No. disciplines in the practice			-0.002 (0.003)
Medical instruments in the practice			0.011 (0.002)**
Comprehensive med. record keeping			0.023 (0.003)**
Routine med. record keeping			0.014 (0.013)
Structure			
Employment status (Ref: salaried)			0.091 (0.017)**
- Self-employed			-0.033 (0.053)
- Mixed			0.134 (0.021)**
Collaboration within PC			

– Appendix 7 to be continued –

n _i =34 n _j = 7,183	Null Model n _i =34 n _j =7,049	Null model + National organisation n _i =34 n _j =7,049	Model 1 Governance n _i =34 n _j =6,608
Professional and administrative processes			
Walk-in hour (Ref: N)			
- Yes			0.008 (0.013)
- Missing values (dummy)			-0.040 (0.053)
OOH Care (ref: within PC only)			
- Other PC providers only			-0.041 (0.016)**
- Also secondary care			-0.012 (0.015)
- Other arrangements			-0.069 (0.016)**
- Missing values (dummy)			-0.014 (0.059)
Environment			
Practice location(Ref: Big city):			
- Suburbs or small town			0.048 (0.013)**
- Mixed urban/rural			0.064 (0.013)**
Variance <u>between</u> countries (s.e.)	0.077 (0.019)**	0.053 (0.013)**	0.052 (0.013)**
Variance <u>within</u> countries (s.e.)	0.168 (0.003)**	0.168 (0.003)**	0.155 (0.003)**
ICC	31.5%	24%	25.2%

* significant at p<0.10 ** significant at p<0.05

n_i=34 n_j= 7,183	Model 2 Economic conditions n_i=34 n_j=6,608	Model 3 Workforce development n_i=34 n_j=6,608	Model 4 Structure n_i=34 n_j=6,608
Cons	0.011 (0.815)	0.574 (0.477)	0.341 (0.511)
National organisation			
Governance			
Economic conditions	1.108 (0.378)**		
Workforce		0.880 (0.229)**	
Overall national structure			0.920 (0.227)**
Background			
Age (centered)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Sex (Female) (Ref: male)	0.001 (0.011)	0.001 (0.011)	0.000 (0.011)
Vision			
Community orientation	0.059 (0.009)**	0.060 (0.009)**	0.059 (0.009)**
Resources			
Duo/ group practice (Ref: solo)	-0.010 (0.013)	-0.011 (0.013)	-0.010 (0.013)
No. disciplines in the practice	-0.002 (0.003)	-0.002 (0.003)	-0.002 (0.003)
Medical instruments in the practice	0.011 (0.002)**	0.011 (0.002)**	0.011 (0.002)**
Comprehensive med. record keeping	0.023 (0.003)**	0.023 (0.003)**	0.023 (0.003)**
Routine med. record keeping	0.014 (0.013)	0.014 (0.013)	0.014 (0.013)
Structure			
Employment status (Ref: salaried)			
- Self-employed	0.091 (0.017)**	0.091 (0.017)**	0.091 (0.017)**
- Mixed	-0.034 (0.053)	-0.035 (0.053)	-0.034 (0.053)
Collaboration within PC	0.135 (0.021)**	0.135 (0.021)**	0.135 (0.021)**

– Appendix 7 to be continued –

n_i=34 n_j= 7,183	Model 2 Economic conditions n_i=34 n_j=6,608	Model 3 Workforce development n_i=34 n_j=6,608	Model 4 Structure n_i=34 n_j=6,608
Professional and administrative processes			
Walk-in hour (Ref: N)			
- Yes	0.009 (0.013)	0.009 (0.013)	0.009 (0.013)
- Missing values (dummy)	-0.040 (0.053)	-0.038 (0.053)	-0.039 (0.053)
OOH Care (ref: within PC only)			
- Other PC providers only	-0.041 (0.016)**	-0.041 (0.016)**	-0.041 (0.016)**
- Also secondary care	-0.011 (0.014)	-0.012 (0.015)	-0.012 (0.015)
- Other arrangements	-0.069 (0.016)**	-0.069 (0.016)**	-0.069 (0.016)**
- Missing values (dummy)	-0.015 (0.059)	-0.014 (0.059)	-0.015 (0.059)
Environment			
Practice location(Ref: Big city):			
- Suburbs or small town	0.047 (0.013)**	0.047 (0.013)**	0.047 (0.013)**
- Mixed urban/rural	0.064 (0.013)**	0.063 (0.013)**	0.064 (0.013)**
Variance <u>between</u> countries	0.047 (0.012)**	0.040 (0.010)**	0.039 (0.010)**
(s.e.)			
Variance <u>within</u> countries (s.e.)	0.155 (0.003)**	0.155 (0.003)**	0.155 (0.003)**
ICC	23.1%	20.7%	20.2%

Appendix 8 Technical procedures

Table1 Detailed results linear random intercept multilevel analyses technical procedures

ni=34 nj= 7,183	Null Model ni=34 nj=7,053	Null model + National organisation ni=34 nj=7,053	Model 1 Governance ni=34 nj= 6,610
Cons	2.203 (0.113)**	-0.319 (1.600)	0.188 (1.936)
National organisation			
Governance			0.407 (0.798)
Economic conditions			
Workforce			
Overall national structure		1.129 (0.715)	
Background			
Age (centered)	-0.001 (0.001)*	-0.001 (0.001)*	-0.001 (0.001)*
Sex (Female) (Ref: male)	-0.166 (0.011)**	-0.166 (0.011)**	-0.123 (0.011)**
Vision			
Community orientation			0.049 (0.009)**
Resources			
Duo/ group practice (Ref: solo)			0.044 (0.013)**
No. disciplines in the practice			0.005 (0.003)
Medical instruments in the practice			0.035 (0.002)**
Comprehensive med. record keeping			-0.004 (0.003)
Routine med. record keeping			-0.019 (0.013)
Structure			
Employment status (Ref: salaried)			
- Self-employed			0.046 (0.018)**
- Mixed			-0.028 (0.054)
Collaboration within PC			0.137 (0.021)**

– Appendix 8 to be continued –

n _i =34 n _j = 7,183	Null Model n _i =34 n _j =7,053	Null model + National organisation n _i =34 n _j =7,053	Model 1 Governance n _i =34 n _j = 6,610
Professional and administrative processes Walk-in hour (Ref: N)			
- Yes			0.014 (0.014)
- Missing values (dummy)			0.030 (0.053)
OOH Care (ref: within PC only)			
- Other PC providers only			-0.060 (0.017)**
- Also secondary care			-0.097 (0.015)**
- Other arrangements			-0.097 (0.017)**
- Missing values (dummy)			-0.057 (0.060)
Environment			
Practice location(Ref: Big city):			
- Suburbs or small town			0.057 (0.013)**
- Mixed urban/rural			0.159 (0.014)**
Variance <u>between</u> countries (s.e.)	0.430 (0.104)**	0.400 (0.097)**	0.293 (0.071)**
Variance <u>within</u> countries (s.e.)	0.194 (0.003)**	0.194 (0.003)**	0.163 (0.003)**
ICC	68.8%	67.3%	64.2%

* significant at p<0.10 ** significant at p<0.05

n _i =34 n _j = 7,183	Model 2 Economic conditions n _i =34 n _j = 6,610	Model 3 Workforce development n _i =34 n _j = 6,610	Model 4 Structure n _i =34 n _j = 6,610
Cons	-2.080 (1.948)	-1.751 (1.160)	-1.145 (1.316)
National organisation			
Governance			
Economic conditions	1.513 (0.905)*		
Workforce		1.413 (0.558)**	
Overall national structure			1.039 (0.588)*

–Appendix 8 to be continued –

n_i=34 n_j= 7,183	Model 2 Economic conditions n_i=34 n_j= 6,610	Model 3 Workforce development n_i=34 n_j= 6,610	Model 4 Structure n_i=34 n_j= 6,610
Background			
Age (centered)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Sex (Female) (Ref: male)	-0.123 (0.011)**	-0.123 (0.011)**	-0.123 (0.011)**
Vision			
Community orientation	0.049 (0.009)**	0.049 (0.009)**	0.049 (0.009)**
Resources			
Duo/ group practice (Ref: solo)	0.044 (0.013)**	0.043 (0.013)**	0.043 (0.013)**
No. disciplines in the practice	0.005 (0.003)	0.005 (0.003)	0.005 (0.003)
Medical instruments in the practice	0.035 (0.002)**	0.035 (0.002)**	0.035 (0.002)**
Comprehensive med. record keeping	-0.004 (0.003)	-0.004 (0.003)	-0.004 (0.003)
Routine med. record keeping	-0.019 (0.013)	-0.019 (0.013)	-0.019 (0.013)
Structure			
Employment status (Ref: salaried)			
- Self-employed	0.046 (0.018)**	0.046 (0.018)**	0.046 (0.018)**
- Mixed	-0.028 (0.054)	-0.028 (0.054)	-0.028 (0.054)
Collaboration within PC	0.137 (0.022)**	0.137 (0.021)**	0.137 (0.021)**
Professional and administrative processes			
Walk-in hour (Ref: N)			
- Yes	0.014 (0.014)	0.014 (0.014)	0.014 (0.014)
- Missing values (dummy)	0.030 (0.053)	0.031 (0.053)	0.030 (0.053)
OOH Care (ref: within PC only)			
- Other PC providers only	-0.060 (0.017)**	-0.060 (0.017)**	-0.060 (0.017)**
- Also secondary care	-0.097 (0.015)**	-0.097 (0.015)**	-0.097 (0.015)**
- Other arrangements	-0.097 (0.017)**	-0.097 (0.017)**	-0.097 (0.017)**
- Missing values (dummy)	-0.057 (0.060)	-0.057 (0.060)	-0.057 (0.060)
Environment			
Practice location(Ref: Big city):			
- Suburbs or small town	0.057 (0.013)**	0.057 (0.013)**	0.057 (0.013)**
- Mixed urban/rural	0.159 (0.014)**	0.159 (0.014)**	0.159 (0.014)**
Variance <u>between</u> countries (s.e.)	0.273 (0.067)**	0.248 (0.061)**	0.270 (0.66)**
Variance <u>within</u> countries (s.e.)	0.163 (0.003)**	0.163 (0.003)**	0.163 (0.003)**
ICC	62.6%	60.3%	62.3%

Appendix 9 Preventive services

Table 1 Detailed results linear random intercept multilevel analyses preventive services

ni=34 nj= 7183	Null Model ni=34 nj=7,069	Null model + National organisation ni=34 nj=7,069	Model 1 Governance ni=34 nj=6,621
Cons	0.197 (0.016)**	0.032 (0.237)	-0.247 (0.338)
National organisation			
Governance			0.100 (0.139)
Economic conditions			
Workforce			
Overall national structure		0.074 (0.106)	
Background			
Age (centered)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Sex (Female) (Ref: male)	-0.006 (0.004)*	-0.006 (0.004)*	-0.003 (0.004)
Vision			
Community orientation			0.011 (0.003)**
Resources			
Duo/ group practice (Ref: solo)			-0.012 (0.004)**
No. disciplines in the practice			0.001 (0.001)
Medical instruments in the practice			0.003 (0.001)**
Comprehensive med. record keeping			0.006 (0.001)**
Routine med. record keeping			0.011 (0.004)**
Structure			
Employment status (Ref: salaried)			
- Self-employed			0.006 (0.006)
- Mixed			0.046 (0.018)**
Collaboration within PC			0.032 (0.007)**

– Appendix 9 to be continued –

n _i =34 n _j = 7183	Null Model n _i =34 n _j =7,069	Null model + National organisation n _i =34 n _j =7,069	Model 1 Governance n _i =34 n _j =6,621
Professional and administrative processes			
Walk-in hour (Ref: N)			
- Yes			-0.000 (0.005)
- Missing values (dummy)			-0.009 (0.018)
OOH Care (ref: within PC only)			
- Other PC providers only			-0.002 (0.006)
- Also secondary care			-0.012 (0.005)**
- Other arrangements			0.001 (0.006)
- Missing values (dummy)			0.005 (0.020)
Environment			
Practice location(Ref: Big city):			
- Suburbs or small town			-0.001 (0.004)
- Mixed urban/rural			0.007 (0.005)
Variance <u>between</u> countries (s.e.)	0.009 (0.002)**	0.009 (0.002)**	0.009 (0.002)**
Variance <u>within</u> countries (s.e.)	0.019 (0.000)**	0.019 (0.000)**	0.018 (0.000)**
ICC	31.3%	31.0%	32.3%

* significant at p<0.10 ** significant at p<0.05

n _i =34 n _j = 7183	Model 2 Economic conditions n _i =34 n _j = 6,621	Model 3 Workforce development n _i =34 n _j =6,621	Model 4 Structure n _i =34 n _j =6,621
Cons	-0.290 (0.352)	-0.005 (0.222)	-0.148 (0.240)
National organisation			
Governance			
Economic conditions	0.132 (0.163)		
Workforce		-0.000 (0.107)	
Overall national structure			0.064 (0.107)

– Appendix 9 to be continued –

n_i=34 n_j= 7183	Model 2 Economic conditions n_i=34 n_j= 6,621	Model 3 Workforce development n_i=34 n_j=6,621	Model 4 Structure n_i=34 n_j=6,621
Background			
Age (centered)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Sex (Female) (Ref: male)	-0.003 (0.004)	-0.003 (0.004)	-0.003 (0.004)
Vision			
Community orientation	0.011 (0.003)**	0.011 (0.003)**	0.011 (0.003)**
Resources			
Duo/ group practice (Ref: solo)	-0.012 (0.004)**	-0.012 (0.004)**	-0.012 (0.004)**
No. disciplines in the practice	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Medical instruments in the practice	0.003 (0.001)**	0.003 (0.001)**	0.003 (0.001)**
Comprehensive med. record keeping	0.006 (0.001)**	0.006 (0.001)**	0.006 (0.001)**
Routine med. record keeping	0.011 (0.004)**	0.011 (0.004)**	0.011 (0.004)**
Structure			
Employment status (Ref: salaried)			
- Self-employed	0.006 (0.006)	0.006 (0.006)	0.006 (0.006)
- Mixed	0.046 (0.018)**	0.046 (0.018)**	0.046 (0.018)**
Collaboration within PC	0.032 (0.007)**	0.032 (0.007)**	0.032 (0.007)**
Professional and administrative processes			
Walk-in hour (Ref: N)			
- Yes	-0.000 (0.005)	-0.000 (0.005)	-0.000 (0.005)
- Missing values (dummy)	-0.009 (0.018)	-0.009 (0.018)	-0.009 (0.018)
OOH Care (ref: within PC only)			
- Other PC providers only	-0.002 (0.006)	-0.002 (0.006)	-0.002 (0.006)
- Also secondary care	-0.012 (0.005)**	-0.012 (0.005)**	-0.012 (0.005)**
- Other arrangements	0.001 (0.006)	0.001 (0.006)	0.001 (0.006)
- Missing values (dummy)	0.005 (0.020)	0.005 (0.020)	0.005 (0.020)
Environment			
Practice location(Ref: Big city):			
- Suburbs or small town	-0.001 (0.004)	-0.001 (0.004)	-0.001 (0.004)
- Mixed urban/rural	0.007 (0.005)	0.007 (0.005)	0.007 (0.005)

– Appendix 9 to be continued –

n_i=34 n_j= 7183	Model 2 Economic conditions n_i=34 n_j= 6,621	Model 3 Workforce development n_i=34 n_j=6,621	Model 4 Structure n_i=34 n_j=6,621
Variance <u>between</u> countries (s.e.)	0.009 (0.002)**	0.009 (0.002)**	0.009 (0.002)**
Variance <u>within</u> countries (s.e.)	0.018 (0.000)**	0.018 (0.000)**	0.018 (0.000)**
ICC	32.2%	32.7%	32.4%

* significant at p<0.10 ** significant at p<0.05

6

Assessing the potential for improvement of primary care in 34 countries a cross-sectional survey

Willemijn LA Schäfer, Wienke GW Boerma, Anna M Murante, Herman JM Sixma, François G Schellevis, Peter P. Groenewegen: Assessing the potential for improvement of primary care in 34 countries: a cross-sectional survey, published in the Bulletin of the World Health Organization, 93 (2015) 1, p.161-168.

Abstract

Objective

To investigate patients' perceptions of improvement potential in primary care in 34 countries.

Methods

We did a cross-sectional survey of 69 201 patients who had just visited general practitioners at primary-care facilities. Patients rated five features of person-focused primary care – accessibility/availability, continuity, comprehensiveness, patient involvement and doctor–patient communication. One tenth of the patients ranked the importance of each feature on a scale of one to four, and nine tenths of patients scored their experiences of care received. We calculated the potential for improvement by multiplying the proportion of negative patient experiences with the mean importance score in each country. Scores were divided into low, medium and high improvement potential. Pair-wise correlations were made between improvement scores and three dimensions of the structure of primary care – governance, economic conditions and workforce development.

Findings

In 26 countries, one or more features of primary care had medium or high improvement potentials. Comprehensiveness of care had medium to high improvement potential in 23 of 34 countries. In all countries, doctor–patient communication had low improvement potential. An overall stronger structure of primary care was correlated with a lower potential for improvement of continuity and comprehensiveness of care. In countries with stronger primary care governance patients perceived less potential to improve the continuity of care. Countries with better economic conditions for primary care had less potential for improvement of all features of person-focused care.

Conclusion

In countries with a stronger primary care structure, patients perceived that primary care had less potential for improvement.

Introduction

Due to the increased prevalence of comorbid conditions, people often have more than one disease that needs to be managed consistently over time [1,2]. Health-care providers can do this through a person-focused approach, which entails goal-oriented, rather than disease-oriented care. The goal is to manage people's illnesses through the course of their life [1,2]. Therefore, person-focused care should be continuous, accessible and comprehensive. It should also be coordinated when patients have more than one provider [1].

Patients' assessment of health care can be divided into what patients find important and what they have experienced [3–5]. Importance refers to what people see as desired features of health care – i.e. patients' instrumental values [6]. The combination of instrumental values and patients' experiences constitute quality judgments, which provides insight on the extent to which health-care providers meet these values. Both instrumental values and experiences of primary care patients vary between countries [6–8]. These judgements can be transformed into a measure of improvement potential. When an aspect of care is experienced as poorly performed, but not considered important, this can be seen as less of a quality problem than if patients consider the aspect important [9]. More important aspects of care thus have higher improvement potential.

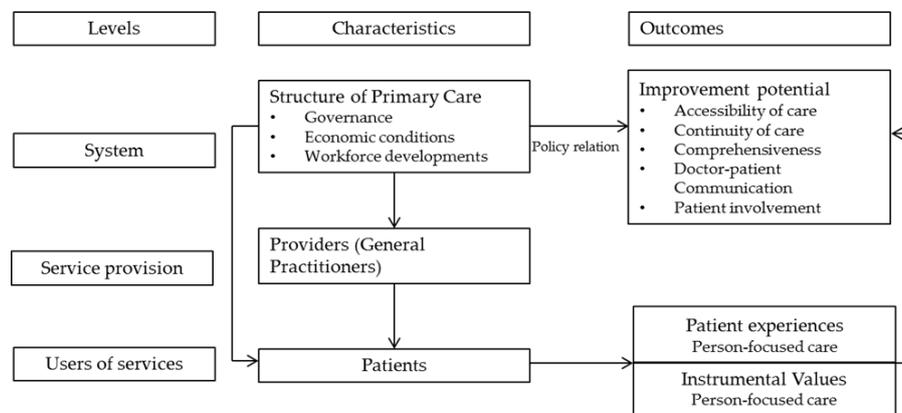
The structure of primary care can relate to person-focused care in various ways. In stronger primary care structures the providers are more likely to be involved in a wide range of health problems at different stages of the patients' lives. This is expected to increase continuity of care and providers' responsiveness to the patients' values regarding continuity, comprehensiveness and communication. Patients will use services more readily if they know a broad spectrum of care is offered [10]. A stronger primary care structure is associated with more accessible primary care [11], which is one of the core features of person-focused care. Therefore, we expect that in countries with a stronger primary care structure, the patient-perceived improvement potential of person-focused primary care is lower.

The primary care structure comprises governance, economic conditions such as the mode of financing of providers and expenditures on primary

care, and workforce development – the profile and the education of the primary-care providers [12,13].

We wished to quantify the extent to which the structure of primary care at the national level in 34 countries is related to patient-perceived improvement potential for features of person-focused care. To study this relationship, the empirical relations between the providers – general practitioners – and patients need to be considered (Fig. 1). The primary care structure influences the behaviour of the practitioners, which will influence patients’ experiences. Patients’ characteristics – e.g. age and income – influence patients’ individual experiences and values. We focus on the system level to study characteristics that are amenable to policy interventions.

Figure 1 Features that influence the extent to which primary care is person-found



Methods

We derived aggregated data on patient-perceived improvement potential in 34 countries from the QUALICOPC study (Quality and Costs of Primary Care in Europe). In this study, patients in 31 European countries (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway,

Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, the former Yugoslav Republic of Macedonia, Turkey, the United Kingdom of Great Britain and Northern Ireland) responded to surveys. Three non-European countries (Australia, Canada, New Zealand) were also included. In each country, patients of general practitioners filled in the questionnaires (target: n = 2200 per country; Cyprus, Iceland and Luxembourg n = 800). In Belgium, Canada, Spain and Turkey, larger samples were taken to enable comparisons between regions (Table 1). We aimed to get a nationally representative sample of general practitioners. If national registers of practitioners were available, we used random sampling to select practitioners. In countries with only regional registers, random samples were drawn from regions that represented the national setting. If no registers existed, but only lists of facilities in a country, a random selection from such lists was made. The patients of only one practitioner per practice or health centre were eligible to participate. Details of the study protocol have been published elsewhere [14,15].

In nearly all countries (30), trained fieldworkers were sent to the participating practices to collect patient data using paper questionnaires. In Canada, Denmark, New Zealand, the United Kingdom and parts of Norway and Sweden, the practice staff were instructed to distribute and collect the questionnaires. The fieldworkers and practice staff were instructed to invite consecutive patients, who had had a face-to-face consultation with the practitioner and who were 18 years or older, to complete the questionnaire until 10 questionnaires per practice were collected. Of these 10 questionnaires, nine assessed the experiences in the consultation which had just occurred and one questionnaire included questions about the patient's primary care values. The proportions of the questionnaires were based on the findings that, within a country, patients' experiences varied widely but there was little variation in what the patients found important [7]. In the patient experience questionnaire, patients were asked to indicate whether they agreed with a statement by selecting "Yes" or "No" answers.

For example, the proportion of negative experiences for the statement "during the consultation the doctor had my medical records at hand" would be the proportion stating that the doctor did not have the medical records at hand. In the patient values' questionnaire – which contained

the same questions as the patient experience questionnaire – patients could indicate the importance of a statement, e.g. the importance of the doctor having medical records at hand, by selecting “not important”, “somewhat important”, “important” or “very important”. The answers were scored, ranging from 1 (not important) to 4 (very important). Missing answers were excluded from the calculations.

Ethical approval was acquired in accordance with the legal requirements in each country. The surveys were carried out anonymously. Data collection took place between October 2011 and December 2013.

The patient experience questionnaire was filled in by 61 931 patients and the patient values’ questionnaire by 7270 patients. Appendices A and B contain the questionnaires (available at: <http://www.nivel.nl/pdf/Appendices-Assesing-the-potential-for-improvement-of-PC-in-34-countries-WHO-Bulletin-2015.pdf>).

Table 1 Overview of the survey investigating the potential for improvement of primary care in 34 countries, 2011-2013

Country	No. of general practitioners facilities ^a	No. of patient experience questionnaires completed	No. of patient values’ questionnaires completed	Relative strength of primary care structure ^b
Australia	133	1190	138	Strong
Austria	180	1596	188	Medium
Belgium	411	3677	407	Medium
Bulgaria	221	1991	222	Weak
Canada	553	5009	806	Strong
Cyprus	71	624	71	Weak
Czech Republic	220	1980	220	Weak
Denmark	212	1878	209	Strong
Estonia	128	1121	126	Medium
Finland	139	1196	129	Medium
Germany	237	2117	234	Medium
Greece	221	1964	219	Weak
Hungary	221	1934	215	Weak
Iceland	90	761	82	Weak
Ireland	191	1694	186	Medium

– Table 1 to be continued –

Country	No. of general practitioners facilities ^a	No. of patient experience questionnaires completed	No. of patient values' questionnaires completed	Relative strength of primary care structure ^b
Italy	219	1959	220	Strong
Latvia	218	1951	212	Medium
Lithuania	225	2011	224	Medium
Luxem-bourg	80	713	79	Weak
Malta	70	626	68	Weak
Netherlands	228	2012	222	Strong
New Zealand	131	1150	197	Strong
Norway	203	1529	175	Medium
Poland	220	1975	219	Weak
Portugal	212	1920	215	Strong
Romania	220	1975	220	Strong
Slovakia	220	1918	220	Weak
Slovenia	219	1963	216	Strong
Spain	433	3731	431	Strong
Sweden	88	773	112	Medium
Switzerland	200	1791	198	Weak
The former Yugoslav Republic of Macedonia	143	1283	143	Medium
Turkey	290	2623	292	Medium
United Kingdom ^c	160	1296	155	Strong

a Patients of one general practitioner per facility were surveyed.

b Based on Kringos et al. 2013.11

c Only patients in England were surveyed.

Operationalisation of concepts

Dependent variables

As an outcome indicator for health care, we used the patient-perceived improvement potential, which is based on the consumer quality (CQ) index, a validated and standardized measurement instrument [16]. Person-focused primary care was measured using 16 items, such as

whether the practitioner displayed knowledge about the patient's personal living circumstances. The items were derived from the CQ index for general practice and tested in the QUALICOPC pilot study [15,17]. Improvement potential was expressed in improvement scores, which are calculated by multiplying the proportion of negative experiences for each question – the answers which indicate lower quality – with the value scores of the corresponding statement per country. The value score was calculated by taking the mean value for each country on a scale from one to four. A higher improvement score indicates a higher need for improvement.

The improvement potential of each country was measured for the following main features: accessibility/availability (five questions), continuity (three questions), comprehensiveness (two questions), patient involvement (one question) and doctor–patient communication (five questions). For each feature, a mean patient-perceived improvement score was calculated. Based on the range of scores found (0.11–1.95) the level of improvement potential is considered relatively low (0.11–0.72), medium (0.73–1.34) or high (1.35–1.95).

Independent variables

For 30 countries (Australia, Canada, New Zealand and the former Yugoslav Republic of Macedonia were excluded), we collected data from the Primary Health Care Activity Monitor (PHAMEU) study on a set of indicators for the dimensions of governance, economic conditions and workforce development of the primary care structure.¹⁸ Examples of such indicators are the availability of evidence-based guidelines for general practitioners (governance) and the percentage of medical universities with a postgraduate programme in family medicine (workforce development) [18]. The PHAMEU database provides scores indicating the strength of each indicator, ranging from 1 (weak) to 3 (strong) and overall scale scores for each dimension, calculated using a two-level hierarchical latent regression model, and an overall structure score combining the three dimensions [11]. Additionally, we collected data for Australia, Canada, New Zealand and the former Yugoslav Republic of Macedonia using the same methods as for the PHAMEU study. Table 1 lists the relative strength of each countries' primary care

structure, Appendix 3 contains the indicators and Appendix 4 contains scale scores per dimension.

Statistical analyses

One-tailed pairwise correlations were used to measure the associations between the independent and dependent variables, because the hypothesis has one direction, namely that a stronger primary care structure is associated with more person-focused care. $P < 0.05$ was considered statistically significant.

Sensitivity analyses were done using an alternative method of analysis for the improvement scores. Multilevel analyses were used to calculate country-level scores of the experience and values items, using the country level residuals of the items. The scores were adjusted for several variables at the practitioner and patient level (e.g. age and gender of the general practitioners and patients).

When comparing the raw improvement scores and the ones calculated on the basis of multilevel residuals no significant differences were found. Correlation coefficients between the raw improvement scores as used in this paper and the adjusted improvement scores were above 0.91.

In the PHAMEU conceptual model and corresponding database, gatekeeping (practitioners determining the necessity for referral of patients to other levels of the health system) is considered to be part of the process of primary care. However, in previous studies, gatekeeping has been used as a potential determinant of primary care performance. Therefore, additional sensitivity analysis was performed on the association between the improvement potential and gatekeeping. The results of this analysis are presented in Appendix 5. Analyses were carried out using Stata version 13.0 (StataCorp. LP, College Station, United States of America) and MLWin version 2.25 (University of Bristol, Bristol, United Kingdom).

Results

Improvement potential

In total, 69 201 patients completed the questionnaire and the average response rate was 74.1% (range: 54.5%–87.6%). A detailed overview of the patients' experience scores, values' scores and patient-perceived improvement scores per country are provided in Appendices 3-5. The background characteristics of the patients can be found in Appendix 6. For accessibility of care, five countries – Cyprus, Portugal, Slovakia, Spain and Turkey – showed a medium level of improvement potential. The remaining countries showed a low improvement potential. While most of the countries were found to have a low improvement potential regarding the continuity of care, Greece, Malta and Turkey show a medium level and Cyprus a high level. Comprehensiveness of care showed a medium level of patient-perceived improvement potential in 20 countries and a relatively high level in Cyprus, Malta and Sweden. Patients' involvement in decision-making about their treatment had a medium level of improvement potential in nine countries and a high level in Cyprus. In all countries, values were relatively low for doctor-patient communication, indicating that the primary-care providers meet their patients' expectations in this domain (Table 2).

The relatively high levels of patient-perceived improvement potential in Cyprus – three features with high potential and one feature with medium – indicate weak performance of primary care. In Turkey, three areas showed a medium level of patient-perceived improvement potential. Countries showing relatively low improvement potential in all features were Australia, Belgium, Canada, Ireland, Latvia, Luxembourg, New Zealand and Switzerland, indicating that primary care in these countries is perceived as person-focused.

Table 2 Mean patient-perceived improvement scores for primary care in 34 countries, 2011-2013

Country	Improvement score ^a				
	Accessibility	Continuity	Comprehensiveness	Involvement	Communication
Australia	0.38	0.14	0.42	0.17	0.16
Austria	0.41	0.38	0.97	0.65	0.20
Belgium	0.34	0.26	0.57	0.26	0.22
Bulgaria	0.66	0.56	1.34	1.17	0.34
Canada	0.38	0.11	0.52	0.18	0.12
Cyprus	1.25	1.40	1.95	1.47	0.38
Czech Republic	0.44	0.26	1.00	0.79	0.18
Denmark	0.26	0.18	0.82	0.56	0.23
Estonia	0.40	0.22	0.87	0.80	0.22
Finland	0.46	0.36	0.81	0.55	0.21
Germany	0.33	0.27	0.81	0.50	0.20
Greece	0.72	1.08	0.70	0.77	0.24
Hungary	0.49	0.49	1.05	0.48	0.30
Iceland	0.53	0.24	1.14	0.46	0.24
Ireland	0.45	0.26	0.72	0.66	0.37

- Table 2 to be continued -

Country	Improvement score ^a				
	Accessibility	Continuity	Comprehensiveness	Involvement	Communication
Italy	0.51	0.31	0.91	0.76	0.42
Latvia	0.51	0.26	0.67	0.70	0.40
Lithuania	0.52	0.38	0.62	0.84	0.24
Luxembourg	0.39	0.31	0.62	0.57	0.23
Malta	0.60	1.17	1.36	0.65	0.33
Netherlands	0.30	0.25	0.91	0.47	0.28
New Zealand	0.22	0.11	0.52	0.18	0.12
Norway	0.52	0.31	0.93	0.52	0.21
Poland	0.55	0.56	1.02	0.90	0.23
Portugal	0.73	0.19	0.50	0.73	0.27
Romania	0.55	0.30	1.04	0.65	0.29
Slovakia	0.74	0.53	1.12	0.63	0.28
Slovenia	0.53	0.32	1.16	0.78	0.23
Spain	0.90	0.29	1.16	0.57	0.36
Sweden	0.54	0.62	1.38	0.60	0.27
Switzerland	0.27	0.18	0.60	0.27	0.16

- Table 2 to be continued -

Country	Improvement score ^a				
	Accessibility	Continuity	Comprehensiveness	Involvement	Communication
The former Yugoslav Rep. of Macedonia	0.38	0.23	0.92	0.61	0.14
Turkey	0.77	0.84	1.06	0.38	0.36
United Kingdom ^b	0.42	0.30	0.77	0.47	0.21

^a The improvement score was calculated by multiplying the proportion of negative patient experiences with the mean importance score.

^b Only patients in England were surveyed.

Note: Scores between 0.11–0.72 were considered as a low level of patient-perceived improvement potential. Scores between 0.73–1.34 were considered as a medium level of patient-perceived improvement potential. Scores between 1.35–1.95 were considered as a high level of patient-perceived improvement potential.

Primary care structure

The patient-perceived improvement potential for continuity and comprehensiveness of care had a significant negative association with the overall structure of primary care. If a country has a stronger primary care structure, primary care is more person-focused for these features. For the separate structural dimensions, patients' perceived care to be more continuous in countries with stronger primary care governance. Stronger economic conditions in primary care were found to be associated with all features of person-focused care. Although workforce development correlated negatively with all features, none of the values were significantly correlated (Table 3).

Table 3 Correlations between the strength of primary care structure and patient perceived improvement scores in 34 countries, 2011-2013

Feature	Primary care structure			
	Overall	Governance	Economic conditions	Workforce development
Accessibility	-0.2562	-0.1136	-0.3187*	-0.2244
Continuity	-0.3962*	-0.3320*	-0.3833*	-0.2263
Comprehensiveness	-0.3230*	-0.1739	-0.3663*	-0.269
Involvement	-0.2833	-0.0484	-0.5768*	-0.2772
Communication	-0.1202	-0.0475	-0.3720*	-0.0513

*P < 0.05 (one-tailed).

In eight countries where patient-perceived improvement potential is relatively low, the overall strength of the primary care structure varies. The relative strength is strong in Australia, Canada and New Zealand, medium in Belgium, Ireland and Latvia and weak in Luxembourg and Switzerland. The strongest associations between strength and improvement potential were found for economic conditions for primary care. These conditions are relatively strong in Australia, Belgium and New Zealand and medium in Latvia and Switzerland.

Discussion

This study evaluates the extent to which primary care in 34 countries is person-focused by asking patients of general practitioners about what they find important and their actual experiences. The combination of these aspects provides us with insight on what patients perceive as priority improvement areas. In most countries primary care shows one or more features with a medium or high level of patient-perceived improvement potential. Accessibility and continuity of care show relatively low improvement potential, while in many countries comprehensiveness is indicated as a priority area. In this study, comprehensiveness of care indicates whether general practitioners ask their patients about additional problems and whether there is opportunity to discuss psychosocial problems. Our results confirm previous studies showing that practitioners perform well on general aspects of communication [19–21]. One explanation for this result could be the on-going relationship between practitioners and their patients. Larger variations have been found between countries on the relevance of communication and practitioners' performance for specific issues [22]. Eight countries showed low improvement potential in all features, indicating positive patient experiences. Previous studies in Australia and New Zealand have also found positive patient experiences [23,24]. Another study comparing 10 European countries, found positive patient assessments in Belgium, Germany and Switzerland and less positive assessments in the United Kingdom and the Scandinavian countries [21]. This is largely in line with our findings.

We could largely confirm the hypothesis that a stronger primary care structure is associated with more person-focused care. Stronger structures were associated with more continuous and comprehensive care. Continuity is an important aspect of person-focused care. Stronger governance is also associated with more continuity. In countries with stronger economic conditions for primary care we found less improvement potential in all areas.

The sensitivity analysis for the association between gatekeeping and patient-perceived improvement potential showed that gatekeeping was associated only with lower perceived improvement potential for continuity of care.

Strengths of this study were the inclusion of data from many countries and that patients were asked about their actual experiences immediately after the consultation with their practitioners. There were also limitations. First, there are countries where other providers offer primary care besides general practitioners. These providers were not included in this study. Second, only the actual visitors to general practices were surveyed. This means that we do not have information about the people who do not have access to such practices. In all countries, improvement potential for accessibility of care might be higher than measured in this study. For example, a report based on the Canadian QUALICOPC data found that patient-reported access in this study is more positive compared to other previous studies [25-28].

Third, in Greece, most participating general practitioners worked in health centres, while there are also many practitioners in Greece working outside health centres. Comparing different countries should be done cautiously, since the extent to which general practitioners are involved in primary care and the types of illnesses they treat differs between countries. When measuring instrumental values and experiences of patients, people may judge importance by what they have already experienced in health care [6]. For example, when practitioners in a country perform poorly on a certain aspect, patients might have lower expectations and will find this aspect less important. Experiences and values of patients have been found to be correlated [6], perhaps because patients seek health-care providers who deliver care according to their values. The World Health Organization advocates for primary care that puts people first. A stronger primary care structure is necessary to make progress towards this goal [10].

References

- 1 Starfield B. Is patient-centered care the same as person-focused care? *Perm J*. 2011 Spring;15(2):63–9. doi: <http://dx.doi.org/10.7812/TPP/10-148> PMID: 21841928.
- 2 De Maeseneer J, van Weel C, Daeren L, Leyns C, Decat P, Boeckxstaens P, et al. From “patient” to “person” to “people”: the need for integrated, people-centered healthcare. *Int J Pers Cent Med*. 2012;2(3):601–14.
- 3 van Campen C, Sixma HJ, Kerssens JJ, Peters L, Rasker JJ. Assessing patients’ priorities and perceptions of the quality of health care: the development of the QUOTE-Rheumatic-Patients instrument. *Br J Rheumatol*. 1998 Apr;37(4):362–8. doi: <http://dx.doi.org/10.1093/rheumatology/37.4.362> PMID: 9619883.
- 4 Sixma HJ, van Campen C, Kerssens JJ, Peters L. Quality of care from the perspective of elderly people: the QUOTE-elderly instrument. *Age Ageing*. 2000 Mar;29(2):173–8. doi: <http://dx.doi.org/10.1093/ageing/29.2.173> PMID: 10791453.
- 5 Sixma HJ, Kerssens JJ, Campen CV, Peters L. Quality of care from the patients’ perspective: from theoretical concept to a new measuring instrument. *Health Expect*. 1998 Nov;1(2):82–95. doi: <http://dx.doi.org/10.1046/j.1369-6513.1998.00004.x> PMID: 11281863.
- 6 Groenewegen PP, Kerssens JJ, Sixma HJ, van der Eijk I, Boerma WG. What is important in evaluating health care quality? An international comparison of user views. *BMC Health Serv Res*. 2005 Feb 21;5(1):16. doi: <http://dx.doi.org/10.1186/1472-6963-5-16> PMID: 15723701.
- 7 Kerssens JJ, Groenewegen PP, Sixma HJ, Boerma WG, van der Eijk I. Comparison of patient evaluations of health care quality in relation to WHO measures of achievement in 12 European countries. *Bull World Health Organ*. 2004 Feb;82(2):106–14. PMID: 15042232.

- 8 Grol R, Wensing M, Mainz J, Ferreira P, Hearnshaw H, Hjortdahl P, et al. Patients' priorities with respect to general practice care: an international comparison. European Task Force on Patient Evaluations of General Practice (EUROPEP). *Fam Pract*. 1999 Feb;16(1):4–11. doi: <http://dx.doi.org/10.1093/fampra/16.1.4> PMID: 10321388.
- 9 Jung H, Wensing M, de Wilt A, Olesen F, Grol R. Comparison of patients' preferences and evaluations regarding aspects of general practice care. *Fam Pract*. 2000 Jun;17(3):236–42. doi: <http://dx.doi.org/10.1093/fampra/17.3.236> PMID: 10846142.
- 10 The world health report 2008: primary health care now more than ever. Geneva: World Health Organization; 2008.
- 11 Kringos D, Boerma W, Bourgueil Y, Cartier T, Dedeu T, Hasvold T, et al. The strength of primary care in Europe: an international comparative study. *Br J Gen Pract*. 2013 Nov;63(616):e742–50. doi: <http://dx.doi.org/10.3399/bjgp13X674422> PMID: 24267857.
- 12 Kringos DS, Boerma WG, Hutchinson A, van der Zee J, Groenewegen PP. The breadth of primary care: a systematic literature review of its core dimensions. *BMC Health Serv Res*. 2010;10(1):65. doi: <http://dx.doi.org/10.1186/1472-6963-10-65> PMID: 20226084.
- 13 Kringos DS. The importance of measuring and improving the strength of primary care in Europe: results of an international comparative study. *Türk Aile Hek Derg*. 2013;17(4):14.
- 14 Schäfer WLA, Boerma WG, Kringos DS, De Maeseneer J, Gress S, Heinemann S, et al. QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care. *BMC Fam Pract*. 2011;12(1):115. doi: <http://dx.doi.org/10.1186/1471-2296-12-115> PMID: 22014310.
- 15 Schäfer WL, Boerma WG, Kringos DS, De Ryck E, Greß S, Heinemann S, et al. Measures of quality, costs and equity in primary health care instruments developed to analyse and compare primary care in 35 countries. *Qual Prim Care*. 2013;21(2):67–79. PMID: 23735688.

- 16 Delnoij DM, Rademakers JJ, Groenewegen PP. The Dutch consumer quality index: an example of stakeholder involvement in indicator development. *BMC Health Serv Res.* 2010;10(1):88. doi: <http://dx.doi.org/10.1186/1472-6963-10-88> PMID: 20370925.
- 17 Meuwissen LE, de Bakker DH. 'Consumer quality'-index 'General practice care' measures patients' experiences and compares general practices with each other. *Ned Tijdschr Geneeskd.* 2009;153:A180. [Dutch]. PMID: 19900331.
- 18 Kringos DS, Boerma WG, Bourgueil Y, Cartier T, Hasvold T, Hutchinson A, et al. The European primary care monitor: structure, process and outcome indicators. *BMC Fam Pract.* 2010;11(1):81. doi: <http://dx.doi.org/10.1186/1471-2296-11-81> PMID: 20979612.
- 19 Noordman J, Koopmans B, Korevaar JC, van der Weijden T, van Dulmen S. Exploring lifestyle counselling in routine primary care consultations: the professionals' role. *Fam Pract.* 2013 Jun;30(3):332-40. doi: <http://dx.doi.org/10.1093/fampra/cms077> PMID: 23221102.
- 20 Noordman J. Lifestyle counselling by physicians and practice nurses in primary care: an analysis of daily practice [Dissertation]. Nijmegen: Radboud University; 2013. 21. Grol R, Wensing M, Mainz.
- 21 Grol R, Wensing M, Mainz J, Jung HP, Ferreira P, Hearnshaw H, et al.; European Task Force on Patient Evaluations of General Practice Care (EUROPEP). Patients in Europe evaluate general practice care: an international comparison. *Br J Gen Pract.* 2000 Nov;50(460):882-7. PMID: 11141874.
- 22 van den Brink-Muinen A, Verhaak PF, Bensing JM, Bahrs O, Deveugele M, Gask L, et al. Doctor-patient communication in different European health care systems: relevance and performance from the patients' perspective. *Patient Educ Couns.* 2000 Jan;39(1):115-27. doi: [http://dx.doi.org/10.1016/S0738-3991\(99\)00098-1](http://dx.doi.org/10.1016/S0738-3991(99)00098-1) PMID: 11013553.
- 23 Patient experience 2011/12: key findings of the New Zealand health survey. Wellington: Ministry of Health; 2013.

- 24 Healthy communities: Australians' experiences with primary health care in 2010-11. Sydney: National Health Performance Authority; 2013.
- 25 Laberge M, Pang J, Walker K, Wong S, Hogg W, Wodchis W, et al. QUALICOPC (Quality and Costs of Primary Care) Canada: a focus on the aspects of primary care most highly rated by current patients of primary care practices. Ottawa: Canadian Foundation for Healthcare Improvement; 2014.
- 26 Hogg W, Dyke E. Improving measurement of primary care system performance. *Can Fam Physician*. 2011 Jul;57(7):758–60, e241–3. PMID: 21753091.
- 27 Blendon RJ, Schoen C, DesRoches C, Osborn R, Zapert K. Common concerns amid diverse systems: health care experiences in five countries. *Health Aff (Millwood)*. 2003 May-Jun;22(3):106–21. doi: <http://dx.doi.org/10.1377/hlthaff.22.3.106> PMID: 12757276.
- 28 Schoen C, Osborn R, Huynh PT, Doty M, Zapert K, Peugh J, et al. Taking the pulse of health care systems: experiences of patients with health problems in six countries. *Health Aff (Millwood)*. 2005 Jul-Dec;Suppl Web Exclusives:W5-509–25. PMID: 16269444.

Appendices

Appendix 1**Scale scores of primary care structure per country, sorted per dimension**

Country	Overall structure	Country	Governance
UK	2.5129	Netherlands	2.5865
Netherlands	2.4906	Spain	2.5556
Spain	2.4335	UK	2.5446
Portugal	2.4053	Portugal	2.5388
Denmark	2.3875	Italy	2.5281
New Zealand	2.3694	Denmark	2.5188
Slovenia	2.3672	Estonia	2.5167
Canada	2.3564	Romania	2.5139
Australia	2.341	Slovenia	2.5139
Italy	2.3357	Norway	2.5089
Romania	2.3099	FYR Macedonia	2.5035
Finland	2.3059	Australia	2.4893
Estonia	2.3049	Lithuania	2.4854
Turkey	2.2849	Austria	2.4763
Lithuania	2.2762	Turkey	2.4717
Norway	2.273	Sweden	2.4621
Sweden	2.2518	Latvia	2.462
Austria	2.2436	Greece	2.4498
FYR Macedonia	2.2372	Bulgaria	2.4464
Belgium	2.2317	Czech Rep.	2.4394
Germany	2.2222	New Zealand	2.4291
Ireland	2.1799	Canada	2.4228
France	2.1735	Germany	2.4172
Latvia	2.1682	Belgium	2.3865
Czech Republic	2.1604	Poland	2.3783
Poland	2.1409	France	2.3776
Bulgaria	2.1392	Finland	2.3748
Malta	2.1361	Iceland	2.32
Greece	2.1194	Slovakia	2.295
Hungary	2.0964	Malta	2.2724
Slovakia	2.0545	Ireland	2.2704
Switzerland	2.0459	Hungary	2.238
Cyprus	1.966	Cyprus	2.1952
Luxembourg	1.9415	Luxembourg	2.1935
Iceland	1.8366	Switzerland	2.1163

Country	Economic conditions	Country	Workforce development
UK	2.3482	UK	2.3391
New Zealand	2.3482	Netherlands	2.3006
Spain	2.2703	Canada	2.2927
Belgium	2.2556	Denmark	2.2458
Finland	2.2522	Portugal	2.2414
Netherlands	2.249	Ireland	2.2358
Slovenia	2.2316	Finland	2.2224
Australia	2.2301	New Zealand	2.2147
Germany	2.2162	Spain	2.2122
FYR Macedonia	2.2144	Malta	2.1753
Italy	2.2019	Slovenia	2.1524
Turkey	2.1895	Australia	2.132
Romania	2.184	Switzerland	2.1063
Canada	2.1821	Estonia	2.1046
Austria	2.173	Lithuania	2.0917
France	2.1644	Italy	2.0863
Switzerland	2.1644	Turkey	2.0696
Portugal	2.1606	Romania	2.0661
Denmark	2.1507	Hungary	2.0635
Sweden	2.1447	Sweden	2.0584
Slovakia	2.1434	Norway	2.0562
Hungary	2.1395	Belgium	2.0494
Latvia	2.116	Germany	2.0091
Lithuania	2.1116	France	2.0063
Estonia	2.1013	Austria	1.9936
Poland	2.097	Bulgaria	1.9904
Norway	2.0885	Poland	1.984
Luxembourg	2.0845	Czech Republic	1.9558
Greece	2.0649	Cyprus	1.9431
Czech Republic	2.0588	Greece	1.9069
Malta	2.0503	FYR Macedonia	1.8972
Cyprus	2.0482	Latvia	1.8863
Iceland	2.0153	Slovakia	1.885
Ireland	1.9595	Luxembourg	1.838
Bulgaria	1.8764	Iceland	1.6034

Appendix 2 Sensitivity analyses

Table 1 Level of gatekeeping (higher score indicates stronger gatekeeping)*

Country	Level of gatekeeping	Country	Level of gatekeeping
Australia	3	Latvia	2.5
Austria	1	Lithuania	3
Belgium	1	Luxembourg	1
Bulgaria	3	Malta	2
Canada	3	Netherlands	3
Cyprus	1	New Zealand	3
Czech Republic	2	Norway	3
Denmark	2	Poland	2
Estonia	3	Portugal	3
Finland	2	Romania	3
France	2	Slovak Rep.	2
FYR Macedonia	2	Slovenia	3
Germany	1	Spain	3
Greece	2	Sweden	2.5
Hungary	2.5	Switzerland	1
Iceland	2	Turkey	1
Ireland	2	United Kingdom	3
Italy	3		

* (source: Primary Health Care Activity Monitor Database)

Table 2 Correlation coefficient between level of gatekeeping and patient perceived improvement potential (n=34)

	Level of gatekeeping
Accessibility	-0.0636
Continuity	-0.3334*
Comprehensiveness	-0.1314
Involvement	-0.0146
Communication	0.0546

* Significant at $p < 0.05$ (one-tailed)

Interpretation of results

The correlation coefficients between the level of gatekeeping and the patient perceived improvement potential are generally low. However, for the continuity of care it is found that the patient perceived improvement potential is lower in countries with a stronger gatekeeping system.

Appendix 3 Overview of % negative experiences per country

Country (n _i = 34) (n _j = 61,931)	Accessibility/ Availability		Continuity				Compre- hensiveness	Auto- nomy	Doctor-Patient Communication							
	Opening hours are too restricted (n _i =54,894)	Practice is too far (n _i =59,209)	I had to wait too long on the phone (n _i =55,314)	The doctor did not take sufficient time (n _i =61,095)	Did not know how to get out-of-hours care (n _i =60,324)	Doctor did not have medical records at hand (n _i =61,075)	Doctor did not know about living situation (n _i =50,816)	The doctor did not know medical background (n _i =56,202)	Doctor did not ask about other problems (n _i =60,908)	Does not discuss personal problems (n _i =43,085)	Doctor did not involve me in making decisions	Did not Understand what the doctor explained	Did not look into eyes (n _i =58,858)	Doctor did not listen carefully (n _i =61,071)	The doctor did not ask questions (n _i =61,042)	The doctor was not polite (n _i =61,123)
Austria	15.7%	10.5%	4.4%	9.8%	22.0%	11.1%	18.7%	5.2%	38.7%	21.3%	18.9%	5.3%	7.7%	4.8%	7.8%	2.9%
Belgium	14.4%	6.8%	5.0%	2.2%	28.5%	6.8%	13.4%	5.0%	25.2%	13.2%	7.8%	11.6%	15.9%	1.3%	4.4%	0.5%
Bulgaria	29.9%	20.5%	13.7%	10.5%	31.4%	10.3%	37.4%	11.4%	41.6%	46.7%	39.3%	13.8%	13.8%	6.8%	11.6%	3.1%
Cyprus	54.3%	8.8%	35.9%	17.5%	67.4%	31.5%	69.5%	29.3%	51.5%	73.1%	42.4%	9.6%	21.7%	3.9%	13.0%	4.2%

– Appendix 3 to be continued –

Country (n _i = 34) (n _j = 61,931)	Accessibility/ Availability		Continuity				Comprehen- siveness		Auto- nomy	Doctor-Patient Communication						
	Opening hours are too restricted (n _j =54,894)	Practice is too far (n _j =59,209)	I had to wait too long on the phone (n _j =55,314)	The doctor did not take sufficient time (n _j =61,095)	Did not know how to get out-of-hours care (n _j =60,324)	Doctor did not have medical records at hand (n _j =61,075)	Doctor did not know about living situation (n _j =50,816)	The doctor did not know medical background (n _j =56,202)	Doctor did not ask about other problems (n _j =60,908)	Does not discuss personal problems (n _j =43,085)	Doctor did not involve me in making decisions	Did not Understand what the doctor explained	Did not look into eyes (n _j =58,858)	Doctor did not listen carefully (n _j =61,071)	The doctor did not ask questions (n _j =61,042)	The doctor was not polite (n _j =61,123)
Czech Republic	13.3%	10.4%	6.7%	5.6%	46.7%	1.6%	26.3%	2.3%	27.2%	49.0%	28.2%	12.4%	6.5%	2.7%	4.5%	0.9%
Denmark	10.9%	5.0%	11.5%	7.1%	12.0%	6.7%	9.4%	2.0%	51.7%	9.3%	16.4%	10.6%	5.9%	2.8%	12.8%	1.8%
England	18.2%	10.9%	6.8%	6.0%	20.8%	4.0%	19.7%	1.5%	27.2%	35.4%	23.8%	6.0%	14.5%	3.4%	6.9%	1.4%
Estonia	15.5%	3.4%	12.2%	5.0%	28.9%	2.9%	28.6%	2.4%	38.8%	13.3%	13.1%	9.1%	10.4%	2.8%	6.8%	1.9%
Finland	27.8%	6.4%	26.0%	5.4%	12.4%	6.6%	25.5%	4.6%	37.0%	18.1%	17.0%	7.7%	10.6%	2.7%	9.6%	1.2%
Germany	14.2%	9.1%	5.2%	4.2%	19.9%	4.8%	16.3%	4.4%	31.8%	17.9%	14.4%	14.0%	5.9%	1.9%	4.8%	1.0%

– Appendix 3 to be continued –

Country (n _i = 34) (n _j = 61,931)	Accessibility/ Availability			Continuity					Comprehen- siveness	Auto- nomy	Doctor-Patient Communication					
	Opening hours are too restricted (n _j =54,894)	Practice is too far (n _j =59,209)	I had to wait too long on the phone (n _j =55,314)	The doctor did not take sufficient time (n _j =61,095)	Did not know how to get out-of-hours care (n _j =60,324)	Doctor did not have medical records at hand (n _j =61,075)	Doctor did not know about living situation (n _j =50,816)	The doctor did not know medical background (n _j =56,202)	Doctor did not ask about other problems (n _j =60,908)	Does not discuss personal problems (n _j =43,085)	Doctor did not involve me in making decisions	Did not Understand what the doctor explained	Did not look into eyes (n _j =58,858)	Doctor did not listen carefully (n _j =61,071)	The doctor did not ask questions (n _j =61,042)	The doctor was not polite (n _j =61,123)
Greece	28.8%	18.5%	11.4%	13.7%	32.9%	47.2%	34.6%	19.6%	25.7%	19.3%	23.8%	12.1%	10.9%	4.2%	4.9%	1.6%
Hungary	17.9%	18.2%	10.8%	6.6%	24.9%	20.7%	26.1%	7.3%	34.8%	45.1%	15.2%	20.6%	**	4.3%	8.6%	2.7%
Iceland	23.0%	7.1%	14.3%	5.4%	30.8%	9.6%	11.9%	1.5%	44.3%	30.1%	13.4%	12.7%	9.3%	2.3%	9.9%	1.9%
Ireland	18.0%	7.4%	8.5%	9.8%	23.1%	5.3%	17.9%	2.6%	32.0%	12.2%	18.1%	12.6%	16.2%	5.4%	13.2%	4.5%
Italy	26.8%	11.9%	14.1%	8.8%	29.9%	16.0%	12.4%	3.0%	50.9%	20.8%	25.0%	10.8%	27.3%	5.2%	17.3%	5.3%
Latvia	20.8%	13.0%	11.1%	19.1%	22.6%	4.8%	21.3%	4.0%	18.1%	33.5%	22.2%	11.8%	40.0%	5.2%	7.8%	3.7%

– Appendix 3 to be continued –

Country (n _i = 34) (n _j = 61,931)	Accessibility/ Availability			Continuity					Comprehen- siveness	Auto- nomy	Doctor-Patient Communication					
	Opening hours are too restricted (n _j =54,894)	Practice is too far (n _j =59,209)	I had to wait too long on the phone (n _j =55,314)	The doctor did not take sufficient time (n _j =61,095)	Did not know how to get out-of-hours care (n _j =60,324)	Doctor did not have medical records at hand (n _j =61,075)	Doctor did not know about living situation (n _j =50,816)	The doctor did not know medical background (n _j =56,202)	Doctor did not ask about other problems (n _j =60,908)	Does not discuss personal problems (n _j =43,085)	Doctor did not involve me in making decisions	Did not Understand what the doctor explained	Did not look into eyes (n _j =58,858)	Doctor did not listen carefully (n _j =61,071)	The doctor did not ask questions (n _j =61,042)	The doctor was not polite (n _j =61,123)
Lithuania	12.4%	12.3%	19.3%	10.1%	31.4%	4.8%	35.3%	5.2%	19.7%	30.7%	26.7%	11.7%	14.1%	4.7%	6.7%	1.8%
Luxembourg	10.7%	6.6%	3.9%	4.0%	35.3%	8.5%	14.5%	5.8%	21.1%	18.4%	16.5%	11.1%	10.5%	2.1%	5.3%	3.1%
FYR Macedonia	19.5%	12.6%	7.6%	5.6%	12.9%	6.1%	14.9%	1.6%	33.0%	45.3%	19.9%	10.7%	5.8%	1.3%	1.3%	0.7%
Malta	26.4%	16.5%	14.2%	3.9%	30.3%	38.5%	45.8%	29.6%	49.1%	49.1%	19.3%	13.5%	19.9%	2.6%	11.9%	1.4%
Netherlands	16.7%	5.4%	11.5%	6.0%	9.3%	7.6%	14.6%	2.4%	50.5%	10.3%	13.6%	9.2%	13.5%	3.1%	11.6%	3.7%
Norway	19.3%	8.2%	24.3%	8.9%	28.7%	7.4%	16.5%	6.1%	47.2%	13.7%	14.5%	8.0%	7.4%	2.9%	9.7%	2.1%

– Appendix 3 to be continued –

Country (n _i = 34) (n _j = 61,931)	Accessibility/ Availability		Continuity			Comprehen- siveness		Auto- nomy	Doctor-Patient Communication							
	Opening hours are too restricted (n _j =54,894)	Practice is too far (n _j =59,209)	I had to wait too long on the phone (n _j =55,314)	The doctor did not take sufficient time (n _j =61,095)	Did not know how to get out-of-hours care (n _j =60,324)	Doctor did not have medical records at hand (n _j =61,075)	Doctor did not know about living situation (n _j =50,816)	The doctor did not know medical background (n _j =56,202)	Doctor did not ask about other problems (n _j =60,908)	Does not discuss personal problems (n _j =43,085)	Doctor did not involve me in making decisions	Did not Understand what the doctor explained	Did not look into eyes (n _j =58,858)	Doctor did not listen carefully (n _j =61,071)	The doctor did not ask questions (n _j =61,042)	The doctor was not polite (n _j =61,123)
Poland	16.8%	15.3%	20.6%	7.1%	25.8%	4.9%	44.6%	14.9%	29.6%	44.6%	27.9%	9.7%	11.7%	3.9%	8.1%	1.4%
Portugal	24.8%	15.7%	29.9%	3.9%	32.2%	3.5%	10.0%	2.8%	21.8%	8.4%	21.8%	15.4%	13.6%	1.6%	5.4%	0.9%
Romania	16.1%	18.6%	8.0%	3.0%	44.6%	5.0%	20.2%	4.6%	19.9%	45.2%	20.2%	19.4%	13.8%	1.8%	5.5%	0.7%
Slovakia	39.6%	27.1%	6.5%	10.1%	53.1%	5.6%	44.6%	4.4%	49.8%	23.9%	20.4%	12.7%	13.7%	5.7%	10.1%	1.7%
Slovenia	26.1%	10.3%	16.8%	6.9%	23.6%	2.0%	27.9%	2.9%	37.2%	37.5%	22.5%	10.9%	7.1%	3.3%	9.0%	1.5%
Spain	31.3%	14.2%	46.5%	12.1%	35.2%	2.3%	21.5%	3.9%	34.8%	39.3%	16.8%	18.0%	20.2%	2.9%	8.4%	2.5%

– Appendix 3 to be continued –

Country (n _i = 34) (n _j = 61,931)	Accessibility/ Availability		Continuity			Comprehen- siveness		Auto- nomy	Doctor-Patient Communication							
	Opening hours are too restricted (n _j =54,894)	Practice is too far (n _j =59,209)	I had to wait too long on the phone (n _j =55,314)	The doctor did not take sufficient time (n _j =61,095)	Did not know how to get out-of-hours care (n _j =60,324)	Doctor did not have medical records at hand (n _j =61,075)	Doctor did not know about living situation (n _j =50,816)	The doctor did not know medical background (n _j =56,202)	Doctor did not ask about other problems (n _j =60,908)	Does not discuss personal problems (n _j =43,085)	Doctor did not involve me in making decisions	Did not Understand what the doctor explained	Did not look into eyes (n _j =58,858)	Doctor did not listen carefully (n _j =61,071)	The doctor did not ask questions (n _j =61,042)	The doctor was not polite (n _j =61,123)
Sweden	21.0%	5.5%	16.5%	9.2%	28.3%	15.7%	34.9%	10.3%	47.3%	38.9%	17.0%	7.7%	8.8%	5.5%	12.2%	3.7%
Switzerland	8.5%	6.4%	3.3%	1.5%	23.5%	4.1%	9.2%	3.8%	25.4%	12.2%	7.8%	10.6%	7.3%	0.7%	3.5%	0.8%
Turkey	21.2%	9.6%	11.8%	3.7%	70.7%	6.5%	51.0%	27.1%	26.1%	40.9%	11.6%	18.7%	25.5%	2.3%	5.3%	1.2%
Australia	10.9%	6.6%	4.5%	2.7%	36.0%	2.2%	9.6%	1.7%	17.3%	8.2%	4.6%	8.0%	12.6%	0.5%	2.0%	0.1%
Canada	9.3%	6.4%	6.0%	2.4%	35.9%	1.7%	11.1%	1.3%	23.9%	11.1%	4.8%	7.7%	14.3%	0.6%	2.6%	0.2%

– Appendix 3 to be continued –

	Accessibility/ Availability		Continuity			Comprehen- siveness	Auto- nomy	Doctor-Patient Communication								
Country (n _i = 34) (n _j = 61,931)																
	Opening hours are too restricted (n _j =54,894)	Practice is too far (n _j =59,209)	I had to wait too long on the phone (n _j =55,314)	The doctor did not take sufficient time (n _j =61,095)	Did not know how to get out-of-hours care (n _j =60,324)	Doctor did not have medical records at hand (n _j =61,075)	Doctor did not know about living situation (n _j =50,816)	The doctor did not know medical background (n _j =56,202)	Doctor did not ask about other problems (n _j =60,908)	Does not discuss personal problems (n _j =43,085)	Doctor did not involve me in making decisions	Did not Understand what the doctor explained	Did not look into eyes (n _j =58,858)	Doctor did not listen carefully (n _j =61,071)	The doctor did not ask questions (n _j =61,042)	The doctor was not polite (n _j =61,123)
New Zealand	6.8%	5.2%	1.7%	1.3%	21.7%	0.5%	9.4%	1.0%	22.1%	10.0%	4.9%	6.3%	7.9%	0.4%	2.7%	0.1%

* All items have been (re)formulated negatively

** This value is missing due to a translation error in the Hungarian questionnaire

Appendix 4 Overview of average values scores per country

Country (n _i = 34) (n _j = 7,270) Range of scores: 1-4	Accessibility/ Availability				Continuity				Compre- hensiveness	Auto- nomy	Doctor-Patient Communication					
	Extensive Opening hours (n _j = 7,177)	Practice close to living or working place (n _j = 7,192)	Short waiting time on phone (n _j = 7,158)	No feeling of time pressure (n _j = 7,197)	Knowledge of out-of-hours care (n _j = 7,168)	The doctor has medical records at hand (n _j = 7,197)	The doctors knows the living situation (n _j = 7,210)	The doctor knows the medical background (n _j = 7,235)	The doctor asks about other problems (n _j = 7,194)	Psychosocial problems can be discussed (n _j = 7,123)	Involvement in decision making (n _j = 7,135)	Understanding what the doctor explains (n _j = 7,190)	The doctor making eye contact (n _j = 7,192)	The doctor listening attentively (n _j = 7,214)	The doctor asking questions (n _j = 7,200)	The doctor being polite (n _j = 7,204)
Austria	3.10	3.24	2.95	3.48	3.48	3.51	2.98	3.61	3.33	3.06	3.44	3.77	2.98	3.59	3.69	3.55
Belgium	2.82	2.88	2.81	3.36	3.07	3.30	2.90	3.48	2.90	3.08	3.30	3.48	2.97	3.49	3.48	3.37
Bulgaria	2.85	2.90	2.85	3.57	3.40	3.38	2.51	3.57	3.27	2.81	2.97	3.48	3.37	3.55	3.48	3.36
Cyprus	3.37	3.31	3.51	3.80	3.25	3.43	2.92	3.70	3.20	3.07	3.48	3.69	3.57	3.75	3.61	3.50

– Appendix 4 to be continued –

Country (n _i = 34) (n _j = 7,270) Range of scores: 1-4	Accessibility/ Availability				Continuity				Comprehen- siveness		Auto- nomy	Doctor-Patient Communication				
	Extensive Opening hours (n _j = 7,177)	Practice close to living or working place (n _j = 7,192)	Short waiting time on phone (n _j = 7,158)	No feeling of time pressure (n _j = 7,197)	Knowledge of out-of-hours care (n _j = 7,168)	The doctor has medical records at hand (n _j = 7,197)	The doctors knows the living situation (n _j = 7,210)	The doctor knows the medical background (n _j = 7,235)	The doctor asks about other problems (n _j = 7,194)	Psychosocial problems can be discussed (n _j = 7,123)	Involvement in decision making (n _j = 7,135)	Understanding what the doctor explains (n _j = 7,190)	The doctor making eye contact (n _j = 7,192)	The doctor listening attentively (n _j = 7,214)	The doctor asking questions (n _j = 7,200)	The doctor being polite (n _j = 7,204)
Czech Republic	2.50	2.76	2.47	3.09	2.63	3.16	2.48	3.48	2.81	2.52	2.79	3.54	2.78	3.41	3.55	3.55
Denmark	2.06	2.59	2.79	3.39	3.14	2.96	2.94	3.52	2.57	3.36	3.40	3.63	3.24	3.51	3.41	3.25
England	3.14	3.14	3.16	3.48	3.32	3.63	2.46	3.67	2.82	3.31	3.57	3.72	3.25	3.58	2.86	3.46
Estonia	3.20	3.03	3.20	3.50	3.22	3.52	2.35	3.69	3.13	2.52	3.37	3.71	3.25	3.61	3.67	3.64
Finland	2.61	2.97	3.09	3.27	3.29	3.47	2.76	3.39	3.02	2.78	3.22	3.66	3.16	3.41	3.40	3.22
Germany	3.03	3.09	3.03	3.50	3.30	3.44	2.95	3.62	3.33	3.18	3.44	3.70	3.03	3.62	3.65	3.52

– Appendix 4 to be continued –

Country (n _i = 34) (n _j = 7,270)	Accessibility/ Availability				Continuity				Comprehen- siveness	Auto- nomy	Doctor-Patient Communication					
	Extensive Opening hours (n _j = 7,177)	Practice close to living or working place (n _j = 7,192)	Short waiting time on phone (n _j = 7,158)	No feeling of time pressure (n _j = 7,197)	Knowledge of out-of-hours care (n _j = 7,168)	The doctor has medical records at hand (n _j = 7,197)	The doctors knows the living situation (n _j = 7,210)	The doctor knows the medical background (n _j = 7,235)	The doctor asks about other problems (n _j = 7,194)	Psychosocial problems can be discussed (n _j = 7,123)	Involvement in decision making (n _j = 7,135)	Understanding what the doctor explains (n _j = 7,190)	The doctor making eye contact (n _j = 7,192)	The doctor listening attentively (n _j = 7,214)	The doctor asking questions (n _j = 7,200)	The doctor being polite (n _j = 7,204)
Greece	3.35	3.55	3.31	3.50	3.38	3.24	2.96	3.55	3.19	3.05	3.22	3.63	3.45	3.67	3.58	3.58
Hungary	2.86	3.09	3.15	3.28	3.24	2.71	2.63	3.23	2.75	2.54	3.17	3.39	3.06	3.43	3.30	3.27
Iceland	3.20	3.04	3.33	3.53	3.30	3.31	2.93	3.54	3.03	3.14	3.40	3.70	2.73	3.43	3.46	3.49
Ireland	3.31	3.18	3.24	3.62	3.41	3.60	2.76	3.68	3.23	3.36	3.63	3.81	3.32	3.71	3.69	3.54
Italy	2.65	2.59	2.59	3.36	2.86	3.18	2.68	3.47	2.54	2.55	3.03	3.46	2.93	3.51	3.24	3.38
Latvia	3.02	3.02	3.03	2.64	3.14	3.16	2.39	3.34	3.00	2.39	3.15	3.38	2.66	3.26	3.34	3.23

– Appendix 4 to be continued –

Country (n _i = 34) (n _j = 7,270)	Accessibility/ Availability				Continuity				Comprehen- siveness		Auto- nomy	Doctor-Patient Communication				
	Extensive Opening hours (n _j = 7,177)	Practice close to living or working place (n _j = 7,192)	Short waiting time on phone (n _j = 7,158)	No feeling of time pressure (n _j = 7,197)	Knowledge of out-of-hours care (n _j = 7,168)	The doctor has medical records at hand (n _j = 7,197)	The doctors knows the living situation (n _j = 7,210)	The doctor knows the medical background (n _j = 7,235)	The doctor asks about other problems (n _j = 7,194)	Psychosocial problems can be discussed (n _j = 7,123)	Involvement in decision making (n _j = 7,135)	Understanding what the doctor explains (n _j = 7,190)	The doctor making eye contact (n _j = 7,192)	The doctor listening attentively (n _j = 7,214)	The doctor asking questions (n _j = 7,200)	The doctor being polite (n _j = 7,204)
Lithuania	3.12	2.83	3.08	2.74	3.22	3.07	2.28	3.45	2.56	2.39	3.13	3.36	2.81	3.20	3.37	3.25
Luxembourg	3.13	3.17	3.04	3.64	3.26	3.41	3.03	3.67	3.30	3.00	3.43	3.82	3.32	3.65	3.63	3.46
FYR Macedonia	3.09	3.28	3.03	3.37	3.46	2.78	3.03	3.54	2.86	3.14	3.08	3.36	3.49	3.56	3.44	3.45
Malta	3.29	3.28	3.18	3.37	3.39	3.29	2.65	3.47	2.75	2.79	3.40	3.62	2.91	3.51	3.54	3.59
Netherlands	2.69	3.00	3.09	3.43	3.44	3.36	2.81	3.60	2.92	3.27	3.48	3.61	3.12	3.51	3.46	3.28
Norway	2.50	2.81	3.07	3.56	2.84	3.33	2.90	3.42	3.01	3.23	3.58	3.70	3.30	3.54	3.52	3.41

– Appendix 4 to be continued –

Country (n _i = 34) (n _j = 7,270)	Accessibility/ Availability				Continuity				Comprehen- siveness		Auto- nomy	Doctor-Patient Communication				
	Extensive Opening hours (n _j = 7,177)	Practice close to living or working place (n _j = 7,192)	Short waiting time on phone (n _j = 7,158)	No feeling of time pressure (n _j = 7,197)	Knowledge of out-of-hours care (n _j = 7,168)	The doctor has medical records at hand (n _j = 7,197)	The doctors knows the living situation (n _j = 7,210)	The doctor knows the medical background (n _j = 7,235)	The doctor asks about other problems (n _j = 7,194)	Psychosocial problems can be discussed (n _j = 7,123)	Involvement in decision making (n _j = 7,135)	Understanding what the doctor explains (n _j = 7,190)	The doctor making eye contact (n _j = 7,192)	The doctor listening attentively (n _j = 7,214)	The doctor asking questions (n _j = 7,200)	The doctor being polite (n _j = 7,204)
Poland	3.10	3.18	3.20	3.50	3.25	3.32	2.30	3.33	3.09	2.53	3.21	3.60	3.15	3.48	3.38	3.37
Portugal	3.43	3.38	3.42	3.45	3.47	3.67	3.28	3.62	3.42	3.14	3.35	3.73	3.47	3.73	3.74	3.70
Romania	2.72	3.02	3.28	3.32	3.06	3.38	2.84	3.53	3.10	3.22	3.22	3.52	3.41	3.60	3.49	3.43
Slovakia	2.98	2.44	2.27	3.07	2.61	3.27	2.79	3.55	3.11	2.91	3.07	3.18	3.02	3.58	3.36	3.11
Slovenia	2.99	3.05	3.17	3.51	3.29	3.62	2.77	3.74	3.17	3.06	3.48	3.73	3.40	3.67	3.67	3.64
Spain	3.21	3.14	3.17	3.39	3.34	3.65	2.93	3.67	3.14	3.11	3.41	3.67	3.17	3.58	3.69	3.61

– Appendix 4 to be continued –

Country (n _i = 34) (n _j = 7,270)	Accessibility/ Availability				Continuity				Comprehen- siveness	Auto- nomy	Doctor-Patient Communication					
	Extensive Opening hours (n _j = 7,177)	Practice close to living or working place (n _j = 7,192)	Short waiting time on phone (n _j = 7,158)	No feeling of time pressure (n _j = 7,197)	Knowledge of out-of-hours care (n _j = 7,168)	The doctor has medical records at hand (n _j = 7,197)	The doctors knows the living situation (n _j = 7,210)	The doctor knows the medical background (n _j = 7,235)	The doctor asks about other problems (n _j = 7,194)	Psychosocial problems can be discussed (n _j = 7,123)	Involvement in decision making (n _j = 7,135)	Understanding what the doctor explains (n _j = 7,190)	The doctor making eye contact (n _j = 7,192)	The doctor listening attentively (n _j = 7,214)	The doctor asking questions (n _j = 7,200)	The doctor being polite (n _j = 7,204)
Sweden	3.27	3.10	3.33	3.57	3.35	3.46	2.74	3.44	3.13	3.30	3.50	3.76	3.30	3.60	3.58	3.53
Switzerland	2.91	3.06	2.87	3.41	3.15	3.44	3.03	3.56	3.21	3.09	3.48	3.66	3.19	3.63	3.57	3.55
Turkey	3.09	3.37	3.35	3.51	3.29	3.32	2.78	3.23	3.19	3.16	3.26	3.47	3.26	3.57	3.49	3.51
Australia	3.12	3.11	2.93	3.43	3.19	3.66	2.93	3.74	3.30	3.22	3.66	3.82	3.28	3.64	3.72	3.57
Canada	3.08	2.85	3.04	3.54	3.21	3.73	2.90	3.82	3.44	3.48	3.75	3.84	3.27	3.68	3.79	3.55

– Appendix 4 to be continued –

	Accessibility/ Availability				Continuity			Comprehensiveness		Autonomy	Doctor-Patient Communication					
Country (n _i = 34) (n _j = 7,270)																
Range of scores: 1-4																
	Extensive Opening hours (n _j = 7,177)	Practice close to living or working place (n _j = 7,192)	Short waiting time on phone (n _j = 7,158)	No feeling of time pressure (n _j = 7,197)	Knowledge of out-of-hours care (n _j = 7,168)	The doctor has medical records at hand (n _j = 7,197)	The doctors knows the living situation (n _j = 7,210)	The doctor knows the medical background (n _j = 7,235)	The doctor asks about other problems (n _j = 7,194)	Psychosocial problems can be discussed (n _j = 7,123)	Involvement in decision making (n _j = 7,135)	Understanding what the doctor explains (n _j = 7,190)	The doctor making eye contact (n _j = 7,192)	The doctor listening attentively (n _j = 7,214)	The doctor asking questions (n _j = 7,200)	The doctor being polite (n _j = 7,204)
New Zealand	2.94	2.73	2.82	3.49	3.12	3.63	2.76	3.78	3.35	3.08	3.61	3.83	3.23	3.63	3.70	3.49

Source: QUALICOPC database version 4.0, March 2015; (see also: Schäfer et al, QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care. BMC Fam Pract. 2011;12(1):115.)

Appendix 5 Overview of improvement scores per country

	Accessibility/ Availability				Continuity			Comprehen- siveness			Auto- nomy	Doctor-Patient Communication				
Ranges of scores: 0-4	Opening hours	Close practice	Waiting time on the phone	Sufficient time	Knowledge out-of- hours care	Medical records at hand	Knowledge of living situation	Knowledge of medical background	Asking about other problems	Personal problems	Patient involvement	Clearly explaining	Making eye contact	Listening carefully	Asking questions	Politeness
Austria	0.49	0.34	0.13	0.34	0.77	0.39	0.56	0.19	1.29	0.65	0.65	0.20	0.23	0.17	0.29	0.10
Belgium	0.41	0.20	0.14	0.07	0.87	0.22	0.39	0.17	0.73	0.41	0.26	0.40	0.47	0.04	0.15	0.02
Bulgaria	0.85	0.59	0.39	0.37	1.07	0.35	0.94	0.41	1.36	1.31	1.17	0.48	0.46	0.24	0.40	0.10
Cyprus	1.83	0.29	1.26	0.67	2.19	1.08	2.03	1.08	1.65	2.25	1.47	0.36	0.77	0.14	0.47	0.15
Czech Republic	0.33	0.29	0.16	0.17	1.23	0.05	0.65	0.08	0.77	1.24	0.79	0.44	0.18	0.09	0.16	0.03
Denmark	0.22	0.13	0.32	0.24	0.38	0.20	0.28	0.07	1.33	0.31	0.56	0.38	0.19	0.10	0.44	0.06

– Appendix 5 to be continued –

Ranges of scores: 0-4	Accessibility/ Availability				Continuity			Comprehen- siveness			Auto- nomy	Doctor-Patient Communication				
	Opening hours	Close practice	Waiting time on the phone	Sufficient time	Knowledge out-of-hours care	Medical records at hand	Knowledge of living situation	Knowledge of medical background	Asking about other problems	Personal problems	Patient involvement	Clearly explaining	Making eye contact	Listening carefully	Asking questions	Politeness
Estonia	0.58	0.33	0.22	0.21	0.67	0.14	0.46	0.05	0.85	0.89	0.80	0.22	0.47	0.12	0.25	0.05
Finland	0.72	0.19	0.80	0.18	0.41	0.23	0.70	0.15	1.12	0.50	0.55	0.28	0.33	0.09	0.32	0.04
Germany	0.43	0.28	0.16	0.15	0.66	0.16	0.48	0.16	1.06	0.57	0.50	0.52	0.18	0.07	0.18	0.03
Greece	0.96	0.66	0.38	0.48	1.11	1.53	1.02	0.70	0.82	0.59	0.77	0.44	0.37	0.15	0.17	0.06
Hungary	0.51	0.56	0.34	0.21	0.81	0.56	0.69	0.23	0.96	1.14	0.48	0.70	0.15	0.28	0.09	
Iceland	0.74	0.22	0.48	0.19	1.02	0.32	0.35	0.05	1.34	0.94	0.46	0.47	0.26	0.08	0.34	0.07
Ireland	0.60	0.24	0.27	0.35	0.79	0.19	0.49	0.09	1.03	0.41	0.66	0.48	0.54	0.20	0.49	0.16
Italy	0.71	0.31	0.36	0.30	0.86	0.51	0.33	0.10	1.29	0.53	0.76	0.37	0.80	0.18	0.56	0.18

–Appendix 5 to be continued –

	Accessibility/ Availability				Continuity				Comprehen- siveness		Auto- nomy	Doctor-Patient Communication				
Ranges of scores: 0-4	Opening hours	Close practice	Waiting time on the phone	Sufficient time	Knowledge out-of- hours care	Medical records at hand	Knowledge of living situation	Knowledge of medical background	Asking about other problems	Personal problems	Patient involvement	Clearly explaining	Making eye contact	Listening carefully	Asking questions	Politeness
Latvia	0.63	0.39	0.34	0.50	0.71	0.15	0.51	0.13	0.54	0.80	0.70	0.40	1.06	0.17	0.26	0.12
Lithuania	0.39	0.35	0.59	0.28	1.01	0.15	0.80	0.18	0.50	0.73	0.84	0.39	0.40	0.15	0.22	0.06
Luxembourg	0.34	0.21	0.12	0.14	1.15	0.29	0.44	0.21	0.69	0.55	0.57	0.42	0.35	0.08	0.19	0.11
FYR Macedonia	0.60	0.41	0.23	0.19	0.44	0.17	0.45	0.06	0.94	0.90	0.61	0.36	0.20	0.05	0.05	0.60
Malta	0.87	0.54	0.45	0.13	1.03	1.27	1.21	1.03	1.35	1.37	0.65	0.49	0.58	0.09	0.42	0.05
Netherlands	0.45	0.16	0.35	0.20	0.32	0.26	0.41	0.09	1.47	0.34	0.47	0.33	0.42	0.11	0.40	0.12
Norway	0.48	0.23	0.75	0.32	0.81	0.25	0.48	0.21	1.42	0.44	0.52	0.29	0.24	0.10	0.34	0.07
Poland	0.52	0.49	0.66	0.25	0.84	0.16	1.03	0.50	0.91	1.13	0.90	0.35	0.37	0.14	0.27	0.05

– Appendix 5 to be continued –

	Accessibility/ Availability				Continuity			Comprehensiveness			Autonomy	Doctor-Patient Communication				
Ranges of scores: 0-4	Opening hours	Close practice	Waiting time on the phone	Sufficient time	Knowledge out-of-hours care	Medical records at hand	Knowledge of living situation	Knowledge of medical background	Asking about other problems	Personal problems	Patient involvement	Clearly explaining	Making eye contact	Listening carefully	Asking questions	Politeness
Portugal	0.85	0.53	1.02	0.14	1.12	0.13	0.33	0.10	0.75	0.26	0.73	0.57	0.47	0.06	0.20	0.03
Romania	0.44	0.56	0.26	0.10	1.36	0.17	0.57	0.16	0.62	1.46	0.65	0.68	0.47	0.06	0.19	0.02
Slovakia	1.18	0.66	0.15	0.31	1.39	0.18	1.25	0.15	1.55	0.70	0.63	0.40	0.41	0.20	0.34	0.05
Slovenia	0.78	0.31	0.53	0.24	0.78	0.07	0.77	0.11	1.18	1.15	0.78	0.41	0.24	0.12	0.33	0.06
Spain	1.00	0.44	1.47	0.41	1.18	0.08	0.63	0.14	1.09	1.22	0.57	0.66	0.64	0.10	0.31	0.09
Sweden	0.69	0.17	0.55	0.33	0.95	0.54	0.95	0.35	1.48	1.28	0.60	0.29	0.29	0.20	0.44	0.13
Switzerland	0.25	0.20	0.09	0.05	0.74	0.14	0.28	0.13	0.81	0.38	0.27	0.39	0.23	0.02	0.12	0.03
Turkey	0.66	0.32	0.40	0.13	2.33	0.22	1.42	0.87	0.83	1.29	0.38	0.65	0.83	0.08	0.18	0.04

– Appendix 5 to be continued –

	Accessibility/ Availability				Continuity			Comprehen- siveness			Auto- nomy	Doctor-Patient Communication				
Ranges of scores: 0-4	Opening hours	Close practice	Waiting time on the phone	Sufficient time	Knowledge out-of- hours care	Medical records at hand	Knowledge of living situation	Knowledge of medical background	Asking about other problems	Personal problems	Patient involvement	Clearly explaining	Making eye contact	Listening carefully	Asking questions	Politeness
England	0.48	0.11	0.38	0.17	0.96	0.11	0.71	0.09	1.09	0.44	0.47	0.34	0.34	0.10	0.19	0.07
Australia	0.34	0.21	0.13	0.09	1.15	0.08	0.28	0.06	0.57	0.26	0.17	0.30	0.41	0.02	0.07	0.00
Canada	0.29	0.18	0.18	0.08	1.15	0.06	0.32	0.05	0.82	0.39	0.18	0.30	0.47	0.02	0.10	0.29
New Zealand	0.20	0.14	0.05	0.05	0.68	0.02	0.26	0.04	0.74	0.31	0.18	0.24	0.25	0.02	0.10	0.00

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Source: QUALICOPC database version 4.0, March 2015; (see also: Schäfer et al, QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care. BMC Fam Pract. 2011;12(1):115.)

Appendix 6 Overview of background characteristics patients per country

	Patient Experiences database		Patient Values database	
	Female (%)	Average age	Female (%)	Average age
Austria	60.4	50.7	58.5	52.9
Belgium	57.6	48.9	60.2	46.4
Bulgaria	57.7	49.0	66.2	46.5
Cyprus	50.9	54.6	61.4	55.2
Czech Republic	58.5	50.2	62.3	46.9
Denmark	63.3	53.5	61.7	52.8
Estonia	62.5	50.4	69.8	46.0
Finland	63.9	59.3	61.2	57.3
Germany	55.4	55.2	58.1	55.6
Greece	55.9	52.8	57.5	51.9
Hungary	64.4	49.6	65.0	47.2
Iceland	63.0	53.3	52.5	52.2
Ireland	66.9	48.2	74.9	47.3
Italy	56.3	56.3	61.8	52.4
Latvia	65.9	45.3	66.0	44.8
Lithuania	69.0	48.3	66.5	46.8
Luxembourg	56.8	48.7	68.0	52.1
Malta	61.9	48.2	54.4	48.1
Netherlands	63.5	50.7	58.6	51.6
Norway	61.9	48.7	63.2	49.0
Poland	60.6	48.4	66.7	45.4
Portugal	65.4	52.8	62.2	52.4
Romania	65.2	49.4	61.6	48.1
Slovakia	52.1	48.9	52.7	45.7
Slovenia	59.1	49.7	58.4	44.7
Spain	58.6	52.7	61.5	50.7
Sweden	64.6	56.4	63.1	55.6
Switzerland	56.6	56.6	53.0	54.6

–Appendix 6 to be continued –

	Patient Experiences database		Patient Values database	
	Female (%)	Average age	Female (%)	Average age
Turkey	61.2	41.2	57.2	38.9
England	63.2	54.9	60.0	55.9
Australia	62.6	54.8	65.9	55.5
Canada	66.8	52.0	69.4	51.3
New Zealand	61.9	58.4	69.2	57.3

Source: QUALICOPC database version 4.0, March 2015; (see also: Schäfer et al, QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care. BMC Fam Pract. 2011;12(1):115.)

GP practices as a one stop shop: how do patients perceive the quality of care?

A cross-sectional study in 34 countries

Schäfer WLA, Boerma WG, Schellevis FG, Groenewegen PP. GP practices as a one stop shop: how do patients perceive the quality of care?

Under review.

Abstract

Objective

To contribute to the current knowledge on how a broad range of services offered by GPs may contribute to the quality as perceived by patients and, hence, the potential benefits of primary care.

Study setting

Between 2011 and 2013 primary care data were collected among GPs and their patients in 31 European countries, plus Australia, Canada and New Zealand. In these countries, GPs are the main providers of primary care and mostly work in practices in the ambulatory setting.

Study design

In this cross-sectional study questionnaires were self-administered by 7,183 GPs and 61,931 visiting patients. Moreover, 7,270 patients answered questions about what they find important, i.e. their values. Data on patients' experiences were collected regarding five areas of non-clinical quality of care: accessibility and continuity of care, doctor-patient communication, patient involvement in decision making and comprehensiveness of care. The breadth of GP service profiles was measured in relation to four areas:

- to what extent they are the first contact to the health care system for patients in need of care;
- their involvement in treatment and follow-up of acute and chronic conditions, i.e. treatment of diseases;
- their involvement in minor technical procedures and
- their involvement in preventive treatments.

Extraction methods

Data of the patients were linked to the data of the GPs. Multilevel modelling was used to construct scale scores for the experiences of patients in the five areas of quality and the breadth of the service profiles of GPs. In these four-level models items were nested within patients, nested in GP practices, nested in countries. The relationship between the breadth of service profiles and the experiences of patients were analysed

in three-level multilevel models, also taking into account the values of patients.

Principal findings

In countries where GPs have broader service profiles patients perceive better accessibility, continuity and comprehensiveness of care and more involvement in decision making. No associations were found between the breadth of GP service profiles and the patient perceived communication with their GP. The breadth of GP service profiles could mostly explain the variation between countries in the areas of patient perceived accessibility and continuity of care.

Conclusion

This study showed that in countries where GP practices serve as a 'one stop shop', patients perceive better quality of care, especially in the areas of accessibility and continuity of care. Therefore, primary care in a country is expected to benefit from investments in broader service profiles of GPs or other primary care physicians.

Introduction

During the past decades, countries have focused on strengthening and maintaining strong primary care worldwide. Policies with this aim are based on the available evidence on the benefits of strong primary care and have been encouraged by international organizations such as the World Health Organization (WHO) [39,40]. Strong primary care is seen as a potential solution to future challenges related to e.g. demographic changes and financial constraints [4,17,41,42]. For patients primary care is the first point where they can access the professional health care system. One of the core values of primary care is that it is comprehensive, meaning that a broad range of services is provided to address a large majority of the health care needs of patients [9,14,31,33]. If primary care physicians offer a broad range of services, this means that there is a smaller dependency on secondary care. Therefore a broad range of services can be seen as an indicator of strong primary care [38]. A previous study found that comprehensive primary care is associated

with better quality in terms of lower rates of hospitalization for ambulatory care sensitive conditions [31]. It is, however, not yet known in detail to what extent the range of services provided in primary care relates to the quality as perceived by patients [7].

It is essential to take into account the perceptions of patients [2,6], as they can provide insight into whether the services delivered are responsive to their needs and expectations. Without taking into account how patients experience care, care delivery too easily becomes provider-centered [8].

Quality of primary care as perceived by patients includes various domains:

- It is important that patients experience good access to primary care, as it is the first point where patients contact a health care provider and facilitates entry to the rest of the healthcare system [31]. Accessibility includes topics as out-of-hours care and waiting times for consultations [16].
- Continuity in the care delivery, e.g. through proper documentation, can help the provider in accumulating knowledge and building a long-standing relationship with patients [3,12]. Additionally, a doctor who is more aware of the living situation and previous conditions of a patient, will be better able to recognize health problems and personal needs [30].
- -To become aware of the needs of a patient it is also important that doctors communicate well with their patients. A health care provider needs to listen carefully to what their patients are saying to become aware of their personal life situation and their conditions [3] and, on the other side, patients need to understand explanations of their provider.
- Health care providers need to involve patients in decisions about the treatment to ensure that these decisions are in line with their personal preferences and match their lifestyle [3,35].
- Finally, primary care also needs to be comprehensive from the perspective of patients to ensure that their needs for healthcare are met [30].

Continuity and comprehensiveness are distinguishing characteristics of primary care. Access, communication and patient involvement are not unique to primary care, but can be seen as essential features and are therefore also taken into account [27,32].

We expect that the range of the services delivered by primary care doctors will be related to the quality perceived by patients. GPs are the main providers of primary care in the countries studied in this paper. It is hypothesized that patients perceive better quality of care when:

- they can visit their GPs as a first contact to the health care system for a broader range of problems;
- their GP doctor will treat of a broader range of acute and chronic conditions, e.g. depression and Parkinson's disease;
- their GP offers a higher range of minor technical procedures, e.g. IUD insertions, and
- their GP actively offers them more preventive treatments.

GPs with broader service profiles will be better able to meet the needs of patients, because they have more services on offer and their practice can be seen as a 'one stop shop' for health care needs of their patients. Their broad involvement is more likely to lead to a longstanding relationship with their patients [14,28], because the patients have a higher possibility to encounter their GP during different stages of their lives. Moreover, patients are more likely to visit GPs for many problems if they know these services are available. Due to a longstanding relationship GPs can become aware of importance of the various aspects of quality of care as perceived by patients. To study our hypothesis, we have formulated the following research question:

How is patient perceived quality of care associated with the breadth of service profiles of their GPs?

This question is answered with data collected among GPs and their patients in 31 European countries, Australia, Canada and New Zealand. The variety in the breadth in GP service profiles and in the models of GP practice organization in these countries provide with a setting for comprehensive analyses [20]. In the large majority of these countries, GPs are medical doctors with a specialized training in family medicine. In the European context GPs practices almost exclusively in the ambulatory setting [7]. In previous analyses we found high variations between and within countries with regard to the breadth of GP service profiles and patient perceived quality of care [18,24]. This study aims to contribute to the current knowledge on how a broad range of services

offered by GPs may contribute to the quality as perceived by patients and, hence, the potential benefits of primary care.

Methods

Data collection

Data used in this paper are derived from the QUALICOPC study (Quality and Costs of Primary Care in Europe). In this study, co-funded by the European Commission (EC), surveys were held among GPs and their patients in 31 European countries (EU 27 – except for France –, Iceland, FYR Macedonia, Norway, Switzerland, Turkey) and three non-European countries (Australia, Canada, New Zealand).

In each country, a nationally representative sample of GPs (target: N=220 GPs; Cyprus, Iceland, Luxembourg and Malta N=80 GPs), and patients (target: N=2,200; Cyprus, Iceland and Luxembourg N=800) filled in the questionnaires. In some countries larger samples were taken in order to enable comparisons between regions. Only one GP per practice or health center was eligible to participate. GP questionnaires were self-administered. In nearly all countries, trained fieldworkers were sent to the participating GP practices to collect patient data using paper or electronic questionnaires. The fieldworkers and practice staff were instructed to consecutively invite patients 18 years or older, who had had a face-to-face consultation with the GP, to complete the questionnaire until 10 questionnaires per practice were collected. Nine patients in every practice completed the questions about their experiences in the consultation which had just occurred. One questionnaire included questions about the patient's values regarding primary care. In six countries local practice staff was instructed to distribute and collect patient surveys on paper according to the study protocol.

Data collection took place between October 2011 and December 2013. In total 61,931 patients completed a questionnaire on their experiences and 7,270 patients on their values. The GP questionnaire was completed by 7,183 GPs (database version 4.3, February 2016). Ethical approval was acquired in accordance with the legal requirements in each country. The

surveys were carried out anonymously. More details about the study protocol have been published elsewhere [5,21,22].

Patient perceived quality

Patient perceived quality was measured by analyzing the experiences of patients and also taking into account what patients find important in each country. The Patient Experiences questionnaire contained questions about five domains of patient perceived quality of care: accessibility of care (5 questions), continuity of care (3 questions), doctor-patient communication (3 questions), patient involvement in decision making (1 question) and comprehensiveness of care (2 questions). Patients responded whether they agreed with each statement with 'yes' or 'no', e.g. whether GPs had the medical records at hand during the consultation. Scales were constructed for the components with multiple items using latent multilevel variable analyses in a four-level model (items nested within patients, nested within GPs, nested within countries). The scale values range from 0 to 100. More details on the content of each scale and reliability scores can be found in appendix A.

In the final model (see 'Statistical analyses') we adjusted for the values of the patients, i.e. what they find important, in each country. In this way a quality judgment by patients was established. The information on what patients find important was derived from the Patient Values questionnaire in which patients were asked to rate the importance of the same items as the Patient Experiences questionnaire from 4 (high) to 1 (low) [24]. Scales for each domain of patient perceived quality were constructed using latent multilevel regression analyses. In these models we adjusted for the age, gender, level of household income, ethnicity, level of education of the patients.

Breadth of GP service profiles

The questionnaires measured GPs' service profiles related to the four aforementioned components: problems for which GPs provide first contact care, treatment of diseases, provision of minor technical procedures and preventive activities. For first contact care, minor technical procedures and treatment of diseases a number of topics were presented and GPs were asked to fill in their involvement on a four-point scale ranging from 'never' (1 point), to 'almost always or always'

(4 points) [1,23]. For example, GPs stated to what extent they are involved in the management and follow-up of patients with depression and whether woman aged 18 asking for oral contraception would contact him or her as the first health care provider [25]. Regarding preventive activities, GPs answered a set of questions related to their systematic involvement in blood pressure and cholesterol measurement and health education (Yes/No). Again, scale scores for the breadth of service profiles in the four areas were calculated using latent multilevel variable analyses. The complete overview of questions used to measure the breadth of GP service profiles can be found in appendix B. Details of the outcomes of the scale construction are published elsewhere [25].

Statistical analyses

To analyze the relationship between the breadth of service profiles and the patient experiences multilevel linear regression models were used. For the analyses of patient involvement logistic regression was used. In the multilevel models patients (lowest level) are nested within GP practices within countries (highest level). In all models we adjusted for the GP's age and gender, and the age, gender, household income, ethnicity and education of the patients. Only patients of whom the GP has filled in a questionnaire were included (60,762 patients). Reductions in variances are calculated after adding the service profile components to the models including background variables.

Results

The average response rate of the patients was 74.1% (range: 54.5% - 87.6%). The average response rate of GPs was 38%, varying from less than 10% in, for example, Austria and Sweden and more than 70% in Greece and Spain. Table 1 provides a summary of the results on the relationship between four components of GP service profiles and five aspects of patient perceived quality of care. Detailed figures are provided in appendices C to G.

Patient perceive better access when their GP has a broader service profile in the areas of first contact care, treatment of diseases and technical procedures. Patient experiences on continuity of care are more positive if

their GP has a broader service profile in the area of first contact care and treatment of diseases. Patient experience to be more involved in decision making and more comprehensive care when their GP is more involved in first contact care and prevention. No associations between the breadth of GP service profiles care and the patient perceived communication was found. In summary, all components of the breadth of GP service profiles are positively related to patient perceived quality of care. The breadth of GP service profiles mostly reduces the variance at country level regarding patient perceived accessibility and continuity and to a lesser extent the country level variance of patient perceived involvement and comprehensiveness. The reductions in variances at the GP practice and patient level vary between 0 and 1.8%.

Table 1: Summary results multilevel analyses associations between breadth of GP service profiles and quality of care

	Access	Continuity	Communication	Involvement	Comprehensiveness
Regression coefficients					
First contact care	0.704 (0.232)*	0.899 (0.310)*	0.032 (0.106)	0.112 (0.048)*	0.860 (0.365)*
Treatment of diseases	0.793 (0.236)*	1.728 (0.315)*	0.083 (0.108)	0.005 (0.048)	0.429 (0.370)
Technical procedures	0.527 (0.195)*	0.382 (0.261)	-0.099 (0.088)	0.009 (0.042)	0.261 (0.306)
Prevention	0.988 (0.602)	0.877 (0.804)	0.297 (0.275)	0.261 (0.127)*	3.189 (0.946)*
Reduction of variance					
Country level	13.1%	7.7%	0%	1.6%	2.4%
GP practice level	1.0%	1.3%	1%	1.8%	0.4%
Patient level	0.6%	0%	1%	-	0.2%
ICCs empty models					
Country level	41.2%	36.4%	12.3%	10%	44.7%
GP practice level	54.8%	26.1%	35.6%	18.2%	52.7%

* Significant at p<0.05

Note: Reductions in variances are calculated after adding the service profile components to the models including background variables.

Discussion and conclusion

Main findings

In this study we evaluated whether the breadth of GP service profiles are associated with patients' perceived on quality of primary care with the aim to contribute to the current knowledge on the potential benefits of primary care. The hypothesis that GPs who offer a broader range of services, deliver better quality of care, as perceived by patients, could be confirmed. The variation between countries in accessibility and continuity of care, and to a lesser extent the comprehensiveness of care and patient involvement in decision making, could be explained by the breadth of GP service profiles. This means that in some of the studied countries patients will perceive better quality of care as the GPs in these countries have broader service profiles. While higher involvement of GPs in first contact care is related to most of the areas of quality studied, broad service profiles in terms of minor technical procedures were only found to be related to the perceived accessibility. Moreover, variation in the perceived communication could not be explained by the breadth of GP service profiles. The communication with GPs is generally perceived as good in the countries included in this study [24].

Relation of findings to previous studies

Previously, international studies have mainly focused on the relationship between the organization of the GP practice and experiences of patients [11,36]. To our knowledge, few studies have been performed on the relationship between the range of services offered within primary care and the evaluations of patients. A study performed in Canada found an increase in patient reported continuity when GPs performed more medical procedures [10]. As it is not clear what kind of medical procedures were taken into account, we do not know how these results exactly relate to our findings. Moreover, previous studies have looked at associations between the range of services provided within primary care and other outcome measures. A broad range of services offered within primary care is found to be associated with better outcomes in terms of improved health [13,19,31,37], lower hospital admission rates for PC sensitive conditions [13,31], but also to higher rates of hospital

admissions for uncontrolled diabetes [34] and reduced disparities in health [29]. Our study adds to the current knowledge by showing that the range of services provided within primary care is positively associated with patient perceived quality of care.

Strengths and limitations

A strength of this study is that it contains detailed analyses based on actual patient experiences, measured directly after consultations, from a large number of patients within many countries. A study conducted in General Practice in the UK showed that measures of patient experience show a modest positive relation to other clinical outcomes [15]. Moreover, this data could be linked to the data of the GP they just visited due to the recruitment strategy. This allowed for a multilevel model in which we could distinguish between variation at the country, GP practice and patient levels. The study also has limitations. The study only evaluated primary care through data collected among GPs and their patients. In some countries there are also other providers of primary care who are not included in this study. Furthermore, this paper focuses on the access as experienced by patients who actually visited a GP practices. This means that patients who do not have access to a GP practice did not participate in this study. Possibly, the association between the breadth of service profiles and accessibility are overestimated. Finally, this study focuses on quantitative data on the experiences of patients with their GP. To improve the practice of clinicians we also need narrative feedback on why patients experience lower quality of primary care [26].

Relevance to the U.S.

The findings of this study are also relevant for other countries, including the U.S. This study indicates that broadening GP service profiles, may increase the quality of care as perceived by patients. This relates to both primary care specific aspects, i.e. continuity and comprehensiveness, and the general aspects, i.e. access and involvement in decision making. These are all important aspects in the treatment of patients with complex care needs. In the U.S., primary care increasingly has to deal with such patients. Meanwhile, primary care physicians in the U.S. expressed their concerns about how well prepared their practices are to manage the care of patients with complex needs [17]. Second, researchers in other

countries can use this study as an example on how to investigate the relationship between elements of the process quality of care and patient perceived quality in a multilevel setting.

Implications for practice

There are various ways to promote broad service profiles among primary care physicians in a country. Firstly, and most evidently, this can be achieved by implementing a broad scope of training in the specialized education. However, it should also be ensured that payment policies fairly compensate the primary care practices for the time and effort invested to function as a 'one stop shop' [7]. This raises the question what investing in broadening service profiles would mean for the costs of health care. This requires a detailed analyses on the costs of primary and secondary care and its relationship between with the service profiles of GPs.

References

- 1 Boerma WG, Van der Zee J and D. M. Fleming. 1997. "Service profiles of general practitioners in Europe. European GP Task Profile Study." *Br.J.Gen.Pract.* 47(421): 481-86.
- 2 Bower P. 2003. "Measuring patients' assessments of primary care quality: the use of self-report questionnaires." *Expert Rev Pharmacoecon Outcomes Res* 3(5): 551-60.
- 3 Ekman I, Swedberg K, Taft C, Lindseth A, Norberg A, Brink E, Carlsson J, Dahlin-Ivanoff S, Johansson IL, Kjellgren K, Liden E, Ohlen J, Olsson LE, Rosen H, Rydmark M, and Sunnerhagen KS. 2011. "Person-centered care--ready for prime time." *Eur J Cardiovasc Nurs* 10(4): 248-51.
- 4 European Commission EXpert Panel on effective ways of investing in Health. 2014. "Definition of a frame of reference in relation to primary care with a special emphasis on financing systems and referral systems." Brussels: European Commission: DG Health & Copnsumers.
- 5 Groenewegen PP, Greß S, and Schäfer W. 2016. "General practitioners' participation in a large, multi-country combined general practitioner – patient survey: recruitment procedures and participation rate." *International Journal of Family Medicine* (Accepted for publication).
- 6 Grol R, Wensing M, Mainz J, Jung HP, Ferreira P, Hearnshaw H, Hjortdahl P, Olesen F, Reis S, Ribacke M and Szecsenyi J. 2000. "Patients in Europe evaluate general practice care: an international comparison." *The British journal of general practice* 50(460): 882-87.
- 7 Grumbach K. 2015. "To be or not to be comprehensive." *Ann Fam Med* 13(3): 204-5.
- 8 Haggerty J. 2011. "Measurement of primary healthcare attributes from the patient perspective." *Health Policy* 7(Spec Issue): 13-20.
- 9 Haggerty J, Burge F, Levesque JF, Gass D, Pineault R, Beaulieu MD and Santor D. 2007. "Operational definitions of attributes of primary health care: consensus among Canadian experts." *Ann Fam Med* 5(4): 336-44.

- 10 Haggerty JL, Pineault R, Beaulieu MD, Brunelle Y, Gauthier J, Goulet F and Rodrigue J. 2008. "Practice features associated with patient-reported accessibility, continuity, and coordination of primary health care." *Ann Fam Med* 6(2): 116-23.
- 11 Heje HN, Vedsted P, Sokolowski I, and Olesen F. 2007. "Doctor and practice characteristics associated with differences in patient evaluations of general practice." *BMC Health Serv Res* 7: 46.
- 12 Kon AA. 2010. "The shared decision-making continuum." *JAMA* 304(8): 903-4.
- 13 Kringos DS, Boerma W, Van der Zee J, Groenewegen P. 2013. "Europe's strong primary care systems are linked to better population health but also to higher health spending." *Health Aff.(Millwood.)* 32(4): 686-94.
- 14 Kringos DS, Boerma WG, Hutchinson A, Van der Zee J and Groenewegen PP. 2010. "The breadth of primary care: a systematic literature review of its core dimensions." *BMC. Health Serv.Res.* 10: 65.
- 15 Llanwarne NR, Abel GA, Elliott MN, Paddison CA, Lyratzopoulos G, Campbell JL and Roland M. 2013. "Relationship between clinical quality and patient experience: analysis of data from the english quality and outcomes framework and the National GP Patient Survey." *Ann Fam Med* 11(5): 467-72.
- 16 Mead N and Bower P. 2000. "Patient-centredness: a conceptual framework and review of the empirical literature." *Soc Sci Med* 51(7): 1087-110.
- 17 Osborn R, Moulds D, Schneider EC, Doty MM, Squires D and Sarnak DO. 2015. "Primary Care Physicians In Ten Countries Report Challenges Caring For Patients With Complex Health Needs." *Health Aff (Millwood)* 34(12): 2104-12.
- 18 Pavlic DR, Sever M, Klemenc-Ketis Z, and Svab I. 2015. "Process quality indicators in family medicine: results of an international comparison." *BMC Fam Pract* 16(1): 172.
- 19 Sans-Corrales M, Pujol-Ribera E, Gene-Badia J, Pasarin-Rua MI, Iglesias-Perez B and Casajuana-Brunet J. 2006. "Family medicine attributes related to satisfaction, health and costs." *Fam Pract* 23(3): 308-16.

- 20 Schäfer W, Groenewegen PP, Hansen J and Black N. 2011a. "Priorities for health services research in primary care." *Qual Prim Care* 19(2): 77-83.
- 21 Schäfer WL, Boerma WG, Kringos DS, De Ryck E, Greß S, Heinemann S, Murante AM, Rotar-Pavlic D, Schellevis FG, Seghieri C, Van den Berg MJ, Westert GP, Willems S and Groenewegen PP. 2013a. "Measures of quality, costs and equity in primary care instruments developed to analyse and compare primary care in 35 countries." *Qual Prim Care* 21(2): 67-79.
- 22 Schäfer WLA, Boerma WG, Kringos DS, De Maeseneer J, Greß S, Heinemann S, Rotar-Pavlic D, Seghieri C, Svab I, Van den Berg MJ, Vainieri M, Westert GP, Willems S and Groenewegen PP. 2011b. "QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care." *BMC.Fam.Pract.* 12: 115.
- 23 Schäfer, WLA, Boerma WG, Kringos DS, De Ryck E, Greß S, Heinemann S, Murante AM, Rotar-Pavlic D, Schellevis FG, Seghieri C, Van den Berg MJ, Westert GP, Willems S and Groenewegen PP. 2013b. "Measures of quality, costs and equity in primary health care: Instruments developed to analyse and compare primary health care in 35 countries." *Qual.Prim.Care* 21(2): 67-79.
- 24 Schäfer WLA, Boerma WG, Murante AM, Sixma HJ, Schellevis FG and Groenewegen PP. 2015. "Assessing the potential for improvement of primary care in 34 countries: a cross-sectional survey." *Bull World Health Organ* 93(3): 161-8.
- 25 Schäfer WLA, Boerma WG, Spreeuwenberg P, Schellevis FG and Groenewegen PP. 2016. "Two decades of change in European general practice service profiles: conditions associated with the developments in 28 countries between 1993 and 2012." *Scandinavian Journal of Primary health Care*.
- 26 Schlesinger, M, Grob R and Shaller D. 2015. "Using Patient-Reported Information to Improve Clinical Practice." *Health Serv Res* 50 Suppl 2: 2116-54.
- 27 Starfield, B. 1992. *Primary Care: Concept, Evaluation and Policy*. New York: Oxford University Press.

- 28 Starfield B. 1998. "Comprehensiveness of care: Who should provide what." In *Primary care: Balancing health needs, services, and technology*. Oxford, New York: Oxford University Press.
- 29 Starfield B. 2006. "State of the art in research on equity in health." *J Health Polit Policy Law* 31(1): 11-32.
- 30 Starfield B. 2011. "Is patient-centered care the same as person-focused care?" *Perm J* 15(2): 63-9.
- 31 Starfield B, Shi L and Macinko J. 2005. "Contribution of primary care to health systems and health." *Milbank Q.* 83(3): 457-502.
- 32 Taira DA, Safran DG, Seto TB, Rogers WH, Inui TS, Montgomery J and Tarlov AR. 2001. "Do patient assessments of primary care differ by patient ethnicity?" *Health Serv Res* 36(6 Pt 1): 1059-71.
- 33 U.S. Institute of Medicine. 1994. "Refining Primary Care: An Interim Report." Washington DC,: National Academy Press.
- 34 Van Loenen T, Faber MJ, Westert GP and Van den Berg MJ. 2016. "The impact of primary care organization on avoidable hospital admissions for diabetes in 23 countries." *Scand J Prim Health Care* 34(1): 5-12.
- 35 Vlek H, Driessen S and Hassink L. 2013. "Persoonsgerichte zorg [Person-focused care]." Utrecht, the Netherlands: Vilans.
- 36 Wensing M, Hermsen J, Grol R and Szecsenyi J. 2008. "Patient evaluations of accessibility and co-ordination in general practice in Europe." *Health Expect* 11(4): 384-90.
- 37 Wilhelmsson S and Lindberg M. 2007. "Prevention and health promotion and evidence-based fields of nursing - a literature review." *Int J Nurs Pract* 13(4): 254-65.
- 38 Wilson A, Windak A, Oleszczyk M, Wilm S, Hasvold T and Kringos D. 2015. "The delivery of primary care services." In *Building primary care in a changing Europe*, edited by Kringos DS, Boerma WGW, Hutchinson A and Saltman R. Copenhagen: World Health Organization.
- 39 World Health Organization. 1978. "Declaration of Alma Ata." International Conference on Primary Health Care. Alma-Ata, USSR.
- 40 World Health Organization. 2008. *The World Health Report 2008: Primary Health Care - Now More Than Ever*. Geneva.

- 41 World Health Organization. 2014. "Twelfth general programme of work 2014-2019: not merely the absence of disease." World Health Organization.
- 42 World Health Organization Regional Office for Europe. 2013. "Health 2020: a European policy framework supporting action across government and society for health and well-being."

Appendices

Appendix 1 Measurement of patient perceived quality of care

The table below shows the statements which were presented to the patients.

<p>Access</p> <ol style="list-style-type: none"> 1. The opening hours are too restricted 2. The practice is too far away from where I am living or working 3. When I called this practice, I had to wait too long to speak to someone 4. The doctor took sufficient time 5. I know how to get evening, night and weekend services <p><i>Reliability score of this scale: Country level: 0.85324; GP practice level: 0.83148; Patient level: 0.39362.</i></p>
<p>Continuity of care</p> <ol style="list-style-type: none"> 1. The doctor had my medical records at hand 2. The doctor knows about my living situation 3. The doctor knows important information about my medical background <p><i>Reliability score of this scale: Country level: 0.83648; GP practice level: 0.80765; Patient level: 0.58808.</i></p>
<p>Communication</p> <ol style="list-style-type: none"> 1. I couldn't really understand what the doctor was trying to explain 2. The doctor hardly looked at me when we talked 3. The doctor listened carefully to me 4. The doctor asked questions about my health problem 5. The doctor was polite <p><i>Reliability score of this scale: Country level: 0.58574; GP practice level: 0.67152; Patient level: 0.78177.</i></p>
<p>Comprehensiveness</p> <ol style="list-style-type: none"> 1. The doctor asked about possible other problems besides the one I just came for 2. This doctor doesn't just deal with medical problems but can also help with personal problems and worries <p><i>Reliability score of this scale: Country level: 0.83348; GP practice level: 0.73198; Patient level: 0.22434.</i></p>
<p>Patient involvement</p> <ol style="list-style-type: none"> 1. The doctor involved me in making decisions about treatment.

Appendix 2

Measurement of the breadth of GP service

First contact care	(Almost) Always	Usually	Occasionally	Seldom/ Never
In case of the following health problems, to what extent will patients in your practice population (people who normally apply to you for primary medical care) contact you as the first health care provider? (This is only about the first contact, not about further diagnosis or treatment).				
1. Child with severe cough	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Child aged 8 with hearing problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Woman aged 18 asking for oral contraception	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Man aged 24 with stomach pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Man aged 45 with chest pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Woman aged 50 with a lump in her breast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Woman aged 60 with deteriorating vision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Woman aged 60 with polyuria	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Woman aged 60 with acute symptoms of paralysis/paresis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Man aged 70 with joint pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Woman aged 75 with moderate memory problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Man aged 35 with sprained ankle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Man aged 28 with a first convulsion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Anxious man aged 45	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Physically abused child aged 13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Couple with relationship problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Woman aged 50 with psycho-social problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Man aged 32 with sexual problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Man aged 52 with alcohol addiction problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Treatment of diseases	(Almost) always	Usually	Occasionally	Seldom/ Never
To what extent are you involved in the treatment and follow-up of patients in your practice population with the following diagnoses ("practice population" means: people who normally apply to you for primary medical care)?				
1. Chronic bronchitis/ COPD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Hordeolum (Stye)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Peptic ulcer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Herniated disc lesion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Congestive heart failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Pneumonia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Peritonsillar abscess	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Parkinson's disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Uncomplicated diabetes (type II)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Rheumatoid arthritis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Depression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Myocardial infarction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical procedures	(Almost) Almost	Usually	Occasionally	Seldom/ Never
To what extent are the following activities carried out in your practice population by you, or your staff, and not by a medical specialist? (Practice population means: people normally applying to you for primary medical care). For example, if fundoscopy is almost always done by you, tick that box.				
1. Wedge resection of ingrown toenail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Removal of sebaceous cyst from the hairy scalp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Wound suturing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Excision of warts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Insertion of IUD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Fundoscopy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Joint injection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Strapping an ankle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Cryotherapy (warts)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Setting up an intravenous infusion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Prevention				
When do you, or your staff, measure <u>blood pressure</u> ? (more than one answer possible)	<input type="checkbox"/> In connection with relevant clinical conditions <input type="checkbox"/> On <u>request</u> <input type="checkbox"/> Routinely in office contacts with adults (<u>regardless</u> of the reason for visit) <input type="checkbox"/> In adults <u>invited</u> for this purpose			
When do you, or your staff, measure <u>blood cholesterol level</u> ? (more than one answer possible)	<input type="checkbox"/> In connection with relevant clinical conditions <input type="checkbox"/> On <u>request</u> <input type="checkbox"/> Routinely in office contacts with adults (<u>regardless</u> of the reason for visit) <input type="checkbox"/> In adults <u>invited</u> for this purpose <input type="checkbox"/> No such measures			
To what extent are you involved in health education as regards the following topics: (more than one answer possible)	<table border="0"> <tr> <td>Not involved</td> <td>In connection with normal patients contacts or special</td> <td>In group sessions programmes</td> </tr> </table>	Not involved	In connection with normal patients contacts or special	In group sessions programmes
Not involved	In connection with normal patients contacts or special	In group sessions programmes		
1. Smoking	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
2. Diet	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
3. Problematic use of alcohol	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			

Appendix 3

Results linear multilevel analyses of patient perceived accessibility

	Empty model N _i =34 N _j =6864 N _k =60,309	+ Background N _i =34 N _j =6836 N _k =57,199	+ Background + Service profiles N _i =34 N _j =6,764 N _k =56,612
Coefficients			
Cons	85.141 (1.019)*	104.605 (17.216)*	99.911 (16.071)*
<i>Patient characteristics</i>			
Age (centered)		0.007 (0.001)*	0.007 (0.001)*
Gender (ref=Male)		0.053 (0.017)*	0.057(0.017)*
Health status (ref=Good)			
- Poor		-0.291 (0.033)*	-0.298 (0.033)*
- Fair		-0.105 (0.020)*	-0.107 (0.020)*
- Very good		0.074 (0.026)*	0.072 (0.026)*
Ethnicity (ref=native)			
- Second generation		-0.128 (0.042)*	-0.126 (0.042)*
- First generation		-0.377 (0.034)*	-0.378 (0.034)*
Education level (ref=medium)			
- Low		-0.106 (0.023)*	-0.106 (0.023)*
- High		0.034 (0.021)	0.035 (0.021)
Household income (ref=average)			
- below average		-0.194 (0.020)*	-0.194 (0.020)*
- above average		-0.018 (0.027)	-0.021 (0.027)
<i>GP characteristics</i>			
Gender GP (ref=male)		-0.259 (0.180)	-0.159 (0.183)
Age GP		-0.001 (0.001)	-0.001 (0.001)
<i>Values</i>			
Patient values access		-6.125 (5.483)	-6.539 (5.114)
<i>Breadth of GP service profiles</i>			
First contact			0.704 (0.232)*
Treatment of diseases			0.793 (0.236)*
Technical procedures			0.527 (0.195)*
Prevention			0.988 (0.602)

– Appendix 3 to be continued –

	Empty model	+ Background	+ Background
	N_i=34	N_i=34	+ Service profiles
	N_j=6864	N_j=6836	N_i=34
	N_k=60,309	N_k=57,199	N_j=6,764
			N_k=56,612
Variances			
Country level	35.020 (8.586)*	33.635 (33.635)*	29.215 (7.200)*
GP level	46.587 (0.804)*	46.414 (0.803)*	45.956 (0.799)*
Patient level	3.376 (0.021)*	3.352 (0.0211)*	3.332 (0.021)*
ICCs			
Country	41.2%	40.3%	37.2%
Practice	54.8%	55.7%	58.5%

* p<0.05

Appendix 4

Results linear multilevel analyses of patient perceived continuity of care

	Empty model Ni=34 Nj=6,864 Nk=59,849	+ Background Ni=34 Nj=6,836 Nk=56,871	+ Background + Service profiles Ni=34 Nj=6,764 Nk=56,458
Coefficients			
Cons	90.439 (1.723)*	36.896 (36.564)	36.233 (35.150)
<i>Patient characteristics</i>			
Age (centered)		0.067 (0.003)*	0.067 (0.003)*
Gender (ref=Male)		0.509 (0.093)*	0.523(0.094)*
Health status (ref=Good)			
- Poor		0.969 (0.178)*	0.985 (0.179)*
- Fair		0.482 (0.111)*	0.484 (0.112)*
- Very good		-0.788 (0.141)*	-0.794 (0.142)*
Ethnicity (ref=native)			
- Second generation		-0.538 (0.230)*	-0.483 (0.231)*
- First generation		-0.719 (0.184)*	-0.690 (0.185)*
Education level (ref=medium)			
- Low		-0.012 (0.123)	-0.026 (0.124)
- High		-0.201 (0.116)	-0.202 (0.117)
Household income (ref=average)			
- below average		-0.258 (0.111)*	-0.265 (0.111)*
- above average		0.316 (0.150)*	0.348 (0.150)*
<i>GP characteristics</i>			
Gender GP (ref=male)		0.158 (0.240)	0.287 (0.244)
Age GP		0.002 (0.001)	0.002 (0.001)
<i>Values</i>			
Patient values cont.		16.469 (11.303)	13.793 (10.871)
<i>Breadth of GP service profiles</i>			
First contact			0.899 (0.310)*
Treatment of chronic conditions			1.728 (0.315)*
Technical procedures			0.382 (0.261)
Prevention			0.877 (0.804)

– Appendix 4 to be continued –

	Empty model	+ Background	+ Background + Service profiles
	N _i =34	N _i =34	N _i =34
	N _j =6,864	N _j =6,836	N _j =6,764
	N _k =59,849	N _k =56,871	N _k =56,458
Variiances			
Country level	100.427 (24.559)*	94.021 (23.014)*	86.765 (21.265)*
GP level	72.022 (1.438)*	70.690 (1.426)*	69.768 (1.418)*
Patient level	103.538 (0.635)*	103.094 (0.650)*	103.188 (0.654)*
ICCs			
Country	36.4%	35.1%	33.4%
Practice	26.1%	26.4%	26.9%

* p<0.05

Appendix 5

Results linear multilevel analyses of patient perceived doctor-patient communication

	Empty model N _i =34 N _j =6,864 N _k =59,849	+ Background N _i =34 N _j =6,836 N _k =56,871	+ Background + service profiles N _i =34 N _j =6,764 N _k =56,289
Coefficients			
Cons	96.359 (0.305)*	78.982 (8.381)*	79.106 (8.434)*
<i>Patient characteristics</i>			
Age (centered)		-0.004 (0.001)*	-0.004 (0.001)*
Gender (ref=Male)		0.039 (0.032)	0.045 (0.032)
Health status (ref=Good)			
- Poor		-0.210 (0.061)*	-0.213 (0.061)*
- Fair		-0.073 (0.038)	-0.069 (0.038)
- Very good		-0.042 (0.048)	-0.051 (0.048)
Ethnicity (ref=native)			
- Second generation		-0.097 (0.078)	-0.086 (0.078)
- First generation		-0.312 (0.063)*	-0.299 (0.063)*
Education level (ref=medium)			
- Low		-0.086 (0.042)*	-0.092 (0.042)*
- High		0.172 (0.040)*	0.168 (0.039)*
Household income (ref=average)			
- below average		-0.076 (0.038)*	-0.079 (0.038)*
- above average		0.057 (0.051)	0.058 (0.051)
<i>GP characteristics</i>			
Gender GP (ref=male)		0.273 (0.082)*	0.255 (0.084)*
Age GP (centered)		-0.000 (0.000)	-0.000 (0.000)
<i>Values</i>			
Patient values comm.		4.941 (2.387)*	4.846 (2.404)*
<i>Breadth of GP service profiles</i>			
First contact			0.032 (0.106)
Treatment of diseases			0.083 (0.108)
Technical procedures			-0.099 (0.088)
Prevention			0.297 (0.275)

–Appendix 5 to be continued –

	Empty model	+ Background	+ Background
	N _i =34	N _i =34	+ service profiles
	N _j =6,864	N _j =6,836	N _i =34
	N _k =59,849	N _k =56,871	N _j =6,764
			N _k =56,289
Variances			
Country level	3.089 (0.764)*	2.636 (0.655)**	2.668 (0.663)**
GP level	8.898 (0.179)*	8.365 (0.170)**	8.278 (0.169)**
Patient level	13.032 (0.080)*	11.888 (0.075)**	11.777 (0.075)**
ICCs			
Country	12.3%	11.5%	11.7%
Practice	35.6%	36.6%	36.4%

* p<0.05

Appendix 6

Results logistic multilevel analyses of patient perceived involvement in decision making

	Empty model + Background		+ Background
	N _i =34	N _i =34	+ Service profiles
	N _j =6,864	N _j =6,836	N _i =34
	N _k =59,418	N _k =56,568	N _j =6,764
			N _k =55,993
Coefficients			
Cons	1.822 (0.118)*	1.607 (0.111)*	1.185 (0.195)*
<i>Patient characteristics</i>			
Age (centered)		0.001 (0.001)	0.001 (0.001)
Gender (ref=Male)		0.092 (0.026)*	0.095 (0.026)*
Health status (ref=Good)			
- Poor		0.046 (0.046)	0.047 (0.047)
- Fair		0.064 (0.047)	0.060 (0.048)
- Very good		-0.054 (0.057)	-0.064 (0.057)
Ethnicity (ref=native)			
- Second generation		-0.188 (0.069)*	-0.190 (0.069)*
- First generation		-0.250 (0.054)*	-0.242 (0.054)*
Education level (ref=medium)			
- Low		0.066 (0.034)*	0.070 (0.034)*
- High		0.143 (0.039)*	0.148 (0.039)*
Household income (ref=average)			
- below average		0.047 (0.030)	0.054 (0.030)
- above average		0.186 (0.050)*	0.192 (0.050)*
<i>GP characteristics</i>			
Gender GP (ref=male)		0.132 (0.038)*	0.133 (0.039)
Age GP		-0.000 (0.000)	0.000 (0.000)
<i>Values</i>			
Patient values involve		2.253 (0.503)*	2.152 (0.507)*
<i>Breadth of GP service profiles</i>			
First contact			0.112 (0.048)*
Treatment of chronic conditions			0.005 (0.048)
Technical procedures			0.009 (0.042)

– Appendix 6 to be continued –

	Empty model + Background		+ Background
	N _i =34	N _i =34	+ Service profiles
	N _j =6,864	N _j =6,836	N _i =34
	N _k =59,418	N _k =56,568	N _j =6,764
			N _k =55,993
Prevention			0.261 (0.127)*
Variiances			
Country level	0.461 (0.114)*	0.315 (0.080)*	0.310 (0.078)*
GP level	0.836 (0.032)*	0.852 (0.034)*	0.837 (0.034)*
ICCs			
Country	10%	7.1%	7.0%
Practice	18.2%	19.1%	18.9%

* p<0.05

	Empty model N _i =34 N _j =6864 N _k =59,851	+ Background N _i =34 N _j =6,836 N _k =56,879	+ Background + Service profiles N _i =34 N _j = 6,764 N _k =56,294
Coefficients			
Cons	68.934 (1.694)*	29.920 (22.343)	28.243 (22.105)
<i>Patient characteristics</i>			
Age (centered)		0.007 (0.001)*	0.007 (0.001)*
Gender (ref=Male)		0.036 (0.022)	0.040 (0.022)
Health status (ref=Good)			
- Poor		0.215 (0.042)*	0.222 (0.042)*
- Fair		0.096 (0.026)*	0.093 (0.026)*
- Very good		-0.072 (0.033)*	-0.071 (0.034)*
Ethnicity (ref=native)			
- Second generation		-0.133 (0.055)*	-0.134 (0.055)*
- First generation		-0.022 (0.044)	-0.022 (0.044)
Education level (ref=medium)			
- Low		-0.013 (0.029)	-0.011 (0.029)
- High		-0.048 (0.028)	-0.048 (0.028)
Household income (ref=average)			
- below average		0.023 (0.026)	0.019 (0.026)
- above average		0.005 (0.036)	-0.001 (0.036)
<i>GP characteristics</i>			
Gender GP (ref=male)		0.988 (0.281)*	1.066 (0.287)*
Age GP		0.002 (0.002)	0.002 (0.002)
<i>Values</i>			
Patient values comp.		12.699 (7.357)	11.563 (7.282)
<i>Breadth of GP service profiles</i>			
First contact			0.860 (0.365)*
Treatment of diseases			0.429 (0.370)
Technical procedures			0.261 (0.306)
Prevention			3.189 (0.946)*

– Appendix 7 to be continued –

	Empty model	+ Background	+ Background
	N_i=34	N_i=34	+ Service profiles
	N_j=6864	N_j=6,836	N_i=34
	N_k=59,851	N_k=56,879	N_j= 6,764
			N_k=56,294
Variances			
Country level	96.802 (23.721)*	89.070 (21.855)*	86.972 (21.356)*
GP level	114.199 (1.965)*	114.119 (1.969)*	113.616 (1.971)*
Patient level	5.642 (0.035)*	5.629 (0.036)*	5.616 (0.036)*
ICCs			
Country	44.7%	42.7%	42.2%
Practice	52.7%	54.6%	55.1%

8

Discussion

This thesis aimed to evaluate primary care service delivery by general practitioners (GPs) in 34 countries. The study distinguished between the perspectives of patients and GPs. We examined how differences within and between countries in the strength of primary care (in terms of the breadth of GP service profiles) could be explained and how they are related to outcomes as perceived by patients. The main question of this thesis is:

How can we explain differences within and between countries in the strength of primary care in terms of the breadth of GP services profiles, and how does this relate to assessments by patients?

To answer the main question, the following sub-questions were formulated:

- 1) *How can primary care service delivery by GPs be evaluated?*
- 2) *How can differences in and between countries in the breadth of GP service profiles be explained?*
- 3) *How are the differences in the strength of primary care associated with patients' assessments of primary care?*

This final chapter discusses the findings related to the three research questions in terms of the hypotheses formulated. It reflects on the hypotheses and theory and on the methodology, goes into the implications for policy makers and the field of primary care, and provides recommendations for future research. It should be noted that the answer to the first question focuses on the evaluation method for primary care as developed for the QUALICOPC (Quality and Costs of Primary Care in Europe) study. The second and third questions focus on the findings from the analyses carried out specifically for this thesis as part of the QUALICOPC study.

Interpretation of findings

Interpretation of findings

Results

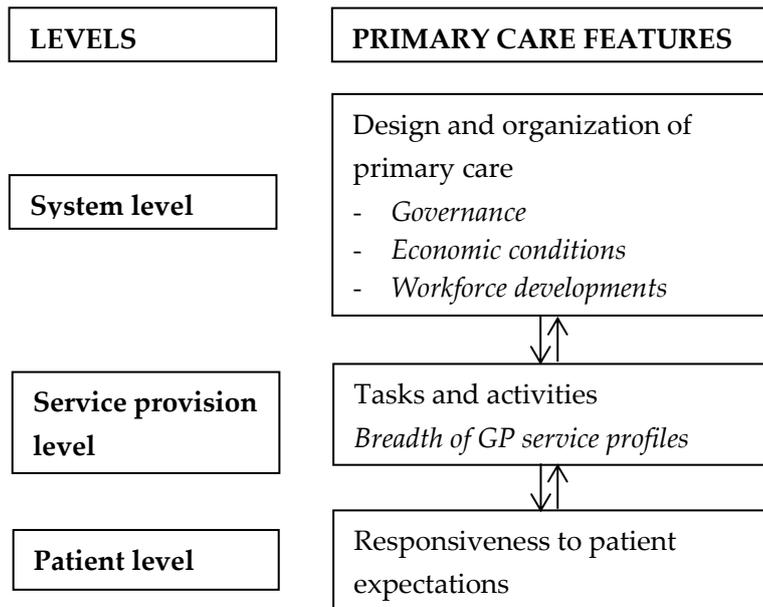
To understand the relationship between the strength of primary care and its outcomes, three levels have been distinguished: the national level

including the characteristics of the healthcare system, the service provision level, and the level of patients. Various earlier studies on the relationship between characteristics of primary care health system outcomes concerned ecological studies at the macro level, i.e. the country level. These studies yielded generally positive outcomes of a strong primary care structure [1-18]. To understand the underlying mechanisms behind these relationships fully, detailed information on the variation within countries and primary care practices is needed.

Various previous studies have disentangled this relationship by collecting more detailed information at the service provision level, e.g. through surveys among GPs and primary care nurses, and at the patient level, e.g. by evaluating how primary care is perceived by patients [19-22]. However, a lot of the currently available evidence is from studies with a limited focus, not representing the diverse situations of healthcare in the countries studied in this thesis. This thesis was carried out as part of the QUALICOPC study which includes 31 European and 3 non-European countries. The variety of organisational models and provision of healthcare services in these countries allows us to disentangle the relationship between the strength of primary care and its outcomes.

Each country has a unique set of features in the organisation of primary care, both at the country and GP practice level. This study makes it possible to evaluate which features are related to broader GP service profiles, for example, or better quality as perceived by patients. The rich diversity of the structure and financing of European health systems makes this setting a laboratory for comparative research [23].

Figure 1: Features of primary care and their interrelationships



In this study we developed a data collection method which gives insights into the details at the three different levels. The model in Figure 1 provides an overview of these levels and their interrelationships. We used several methods of data collection. Firstly, databases from other international studies were used to obtain a picture of the characteristics of the national primary care structure. Two important sources were the PHAMEU (Primary Healthcare Activity Monitor Europe) study in which national level data on the strength of primary care was collected and the 1993 European GP Task Profile Study [19,24]. Using existing databases allowed us to build further on what is already known about determinants and outcomes of the strength of primary care. Secondly, new data was collected, using cross-sectional surveys among GPs and their patients. Four questionnaires were developed with the aim of understanding the variation in the organisation and delivery of primary care and its outcomes: one for GPs, one for patients about their experiences with their GP, another for patients about what they consider

important, and a practice questionnaire filled in by field workers who visited the practices. The questions were derived from existing validated questionnaires. Three of the main sources were the Primary Care Evaluation Tool [22], the Primary Care Assessment Tool [25] and the European GP Task Profile Survey [26]. These tools proved to be applicable in various settings as they have previously been applied in many countries. In the development process of the questionnaires, getting a qualitative idea of the variation within countries and practices was a core selection criterion for including the questions. Questions were not included if they referred to a characteristic of the healthcare system rather than to a characteristic of an individual practice or experience of a patient. When developing the questionnaires, we focused on the core dimensions of the primary care structure (governance, workforce development and economic conditions), process (comprehensiveness, continuity and coordination of primary care and access to primary care) and its outcomes (quality of primary care, efficiency of primary care and equity in health) [27]. The GP questionnaire focused mainly on the organizational aspects (e.g. the employment status of GPs) and care processes (e.g. comprehensiveness of services of primary care). The patient experiences questionnaire focused on the care processes and quality as perceived by patients (e.g. how patients experienced communication during the consultation). To gain insights into patient-perceived quality, a separate questionnaire was developed on what patients consider important. This enabled us to weight the patient experiences according to how important they were found by patients in a country. This approach was based on the QUOTE instrument and Consumer Quality index [28,29].

Considerations

The main advantage of the evaluation method developed and the data collected within the QUALICOPC study is that we can disentangle the relationship between the strength of primary care and its outcomes further. The study has developed an instrument making it possible to evaluate primary care services and how they are perceived by patients. Most previous studies focused either only on the perspective of the GPs or on the experiences of patients. As the aim of this study was to disentangle relationships between the different levels of care, an

anonymous code was used in the survey process allowing the data of the patients to be linked to the data of the GPs they visited. This approach made it possible to evaluate the service delivery of primary care. The methodology developed allows characteristics of national primary care structures and primary care practice organisation to be linked to the breadth of GP service profiles, which could in turn be related to the quality as perceived by patient.

Secondly, the study lets countries benchmark their primary care processes and outcomes against each other. Other international studies providing benchmarking information were often conducted in fewer countries (mainly OECD countries) or were conducted many years ago. This study has provided detailed and updated information on the performance of primary care in 34 countries. Thirdly, the methods of data collection and the surveys presented can be used as an example for evaluating primary care in other countries that were not part of the study carried out between 2011 and 2013. The tools were used in Malaysia and China in 2015-2016 to evaluate the performance of primary care.

Explanations of variations in the breadth of GP service profiles

Results

What GPs do, i.e. the breadth of their service profiles, is a core indicator of strong primary care [27]. Between 1993 and 2012, the involvement of GPs in European countries in treatment of – mainly chronic – diseases increased and their involvement in preventive activities decreased [30]. Three hypotheses were formulated and tested to explain changes over time in the breadth of GP service profiles (see Table 1, H1-H3). We found that GP service profiles expanded in one or more areas in countries where there was a stronger increase in healthcare expenditure between 1993 and 2012, in countries with a less dominant family orientation, and in countries where GPs have a higher professional status. No other national conditions were found to be related to the changes.

To gain a more detailed picture of what determines the breadth of GP service profiles, we also analysed how characteristics of the primary care structure and GPs were related to the breadth of GP service profiles. There is a lot of variation in the breadth of GP service profiles within and

between European countries, Australia, Canada and New Zealand, particularly regarding technical procedures. Various hypotheses were formulated to analyse this variation (see Table 1, H4-H8). It was found that a broader community orientation, more medical instruments in the practice, and more of collaboration are positively associated with all components of the GP service profiles. For preventive services, the resources, structure and vision are important but none of the other components of the practice organisation are. No associations with the primary care structure were found either.

Table 1 Determinants of the breadth of GP service profiles

No	Hypothesis	Sub hypothesis	Result + = supported; +/- = partly supported - =not supported	Level of analyses	Chapter
H1	GP service profiles have expanded more between 1993 and 2012 in countries where urgency for reform oriented at primary care was higher due to:	<ul style="list-style-type: none"> - a stronger increase in the percentage of people above the age of 65 between 1993 and 2012 - a stronger increase in healthcare expenditure between 1993 and 2012 - a stronger decrease in life expectancy in the early 1990s - a less strong family orientation in the population of the country 	<ul style="list-style-type: none"> - No relationship was found. +/- in countries with stronger increases in healthcare expenditures, GP service profiles expanded for treatment of diseases and minor technical procedures, but not in the other areas. - No relationship was found. +/- in countries with less strong family orientation, the breadth GP service profiles increased regarding first contact care and treatment of diseases. 	Health system level (<i>macro level</i>)	4

– Table 1 to be continued –

No	Hypothesis	Sub hypothesis	Result + = supported; +/- = partly supported - =not supported	Level of analyses	Chapter
H2	GP service profiles expanded more between 1993 and 2012 in countries with more interventionist policies to strengthen primary care due to longer periods in government of left-wing parties		- No relationship was found.	Health system level (<i>macro level</i>)	4

– Table 1 to be continued –

No	Hypothesis	Sub hypothesis	Result + = supported; +/- = partly supported - =not supported	Level of analyses	Chapter
H3	GP service profiles expanded more between 1993 and 2012 in countries with better means to strengthen the GP service profiles due to:	- a higher level of government effectiveness - more centralized government - and a higher professional status of GPs in the country	- No relationship was found. - No relationship was found. +/- The breadth of GP service profiles regarding first contact care increased in countries where GPs have a higher professional status.	Health system level (<i>macro level</i>)	4
H4	GPs will have broader service profiles in countries with a pro-primary care national organisation.		+/- in countries with a national pro-primary care organisation, GP service profiles are broader in all areas except preventive services.	Health system and service provision level (macro and meso level)	5

– Table 1 to be continued –

No	Hypothesis	Sub hypothesis	Result + = supported; +/- = partly supported - =not supported	Level of analyses	Chapter
H5	GPs will have broader service profiles in <u>first contact care</u> when:	<ul style="list-style-type: none"> - conditions for the accessibility of their practice are beneficial due to more resources being available in their practice and better organisational processes facilitating accessibility and availability of care - the GP is more involved due to a more community-oriented vision. 	<ul style="list-style-type: none"> +/- GPs have broader services profiles when there are more physical resources and when they collaborate more. There is no relationship with the number of human resources. GPs have broader service profiles if they have a walk-in hour. No relationship was found with arrangements of out-of-hours care. + GPs have broader service profiles if they have a more community-oriented vision. 	Service provision level (meso level)	5

– Table 1 to be continued –

No	Hypothesis	Sub hypothesis	Result + = supported; +/- = partly supported - =not supported	Level of analyses	Chapter
H6	GPs will broader services profiles in <u>treatment of diseases</u> :	<ul style="list-style-type: none"> - when there is greater availability of human resources. - they are paid according to the volume of services provided, which is more likely if they work on a self-employed basis instead of a salaried basis 	<ul style="list-style-type: none"> +/- GPs have broader service profiles if they collaborate more. There is no relationship with the number of human resources. + GPs have broader service profiles if they are self-employed. 	Service provision level (meso level)	5
H7	GPs will have broader service profiles in <u>minor technical procedures</u> if they have greater availability of technical and human resources.		+ GPs have broader service profiles if there more technical and human resources are available in the practice	Service provision level (meso level)	5

– Table 1 to be continued –

No	Hypothesis	Sub hypothesis	Result	Level of analyses	Chapter
H8	GPs will have broader service profiles in terms of <u>preventive services</u> when they have:	<ul style="list-style-type: none"> - a more comprehensive medical record system where records are kept routinely - and a more community-oriented vision 	<p>+ = supported; +/- = partly supported - =not supported</p> <ul style="list-style-type: none"> + GPs have broader service profiles if they have a more comprehensive medical record system and keep their records on a routine basis + GPs have broader service profiles if they have a more community-oriented vision 	Service provision level (meso level)	5

Theoretical considerations

From the findings related to the first three hypotheses, a general conclusion can be drawn that changes in GP service profiles can only be explained by national conditions to a very limited extent. Additionally, none of the country-level determinants were found to be associated with changes in the delivery of preventive services. We did not find a relationship between the political composition of the governments and the changes in the breadth of service profiles. This is in line with the findings from the PHAMEU study, where no relationship was found between the composition of governments and overall comprehensiveness of primary care, but a stronger primary care structure was found in countries governed by left-wing governments. The researchers of this study indicated that tasks could probably not easily be changed by political parties as tasks are often laid down in regulations [31].

Most relevant for the changes in breadth of service profiles were the conditions related to the urgency of health care reform (i.e. an increase in healthcare expenditure) and a less strong family orientation. These conditions are, however, not directly related to primary care. Kringos et al. found that values related to healthcare in particular are related to the strength of primary care [31]. This is supported by our study as well, as we found that GP service profiles expanded less in countries where people value a strong family orientation highly. In those countries the population probably rely less on formal care and family members invest more time instead in taking care of their family when needed.

Even though we identified only a limited number of determinants related to the changes in GP service profiles over recent decades, we did find a general increase in the involvement of GPs in treatment of diseases (mainly chronic) in Europe. A 2008 study focusing on eight European countries found that several approaches for improving the management and care coordination of chronic conditions have been developed. These approaches were more prominent in countries with stronger primary care systems [32].

In the early 1990s, health status and life expectancy in many Central and Eastern European countries were poor and the healthcare systems were unable to cope with this [33-35]. Most of those countries therefore implemented drastic health system reforms by introducing primary care

with a central role for general practitioners (GPs), together with a gradual reduction of the large hospital sector [36-38]. Our study shows that GPs have been able to expand their service profiles in one or more areas in all Central and Eastern European countries since the 1990s. This indicates that countries have indeed been able to strengthen their primary care successfully in line with the general policy aims related to this. It is noticeable that this cannot be seen for prevention, where GPs became less involved in most countries.

The analyses of the current variation in GP service profiles showed that preventive services also differed in their determinants when compared to the other service profile components. This was in line with our expectations (see Table 1, H5-H8). The organisational characteristics could explain most of the variance between practices for the technical procedures, but least for the involvement in preventive services. Preventive services were not associated with the strength of the national primary care structure, whereas the other three components were. Previous studies found that delivery of a wide range of services is improved by governmental policies that are supportive of primary care [16] and that poor financial investment is a barrier to delivery of primary care [27,39].

At the local level, resources were important for all aspects of service profiles. In practices with more comprehensive medical records, for example, GPs are more involved in first contact care, disease management and technical procedures. Medical record systems are only associated with preventive activities when they are kept routinely. This confirms that the medical record system help perform such tasks.

As regards the resources, availability of more medical instruments is important for all service profile components. The positive association between service profiles and equipment was also found in the previous study [40]. The skill mix of the practice only matters when there is actual collaboration between GPs and other professionals in the form of face-to-face meetings. A multidisciplinary team often requires a lot of coordination to build trust among professionals [41]. This could explain why it is more likely that there is task delegation and enhancement when the professionals have regular meetings.

As in the 1993 GP Task profile study, we found that the environment is important as GP service profiles are broader in more rural areas [40],

even though this is not confirmed for preventive care. A shorter distance from the practice to secondary care is associated with more involvement in first contact care and technical procedures. Earlier, a reverse relationship was also found between first contact care and treatment of diseases [40], but that was not confirmed in this study.

The strength of primary care and the assessments by patients

Results

The relationship between the strength of primary care and patients' assessments of primary care has been analysed in two ways: by examining the associations with the strength of the national primary care structure and by evaluating the relationship with the breadth of the service profiles of the GPs that the patients visited and evaluated. The hypotheses and results can be found in Table 2. In countries with a stronger primary care structure, especially when there are pro-primary care economic conditions, patients perceive better quality of care in various areas. Patients also perceive better quality of care in countries where GPs have broader service profiles, in terms of accessibility, continuity and comprehensiveness of care and more involvement in decision making.

Table 2 Determinants of patient perceived quality of care

No.	Hypothesis	Result	Level of analyses	Chapter
		+ = supported; +/- = partly supported		
		- =not supported		
H9	Patients will perceive more person-focused care in countries where GPs are more likely to be involved with a large scope of health problems in various stages of their lives due to stronger supporting primary care structures.	+/- In countries with pro-primary care economic conditions, patients perceive better quality of care regarding all aspects of person-focused care studied. An overall stronger structure of primary care was correlated with better assessments of continuity and comprehensiveness of care. In countries with stronger primary care governance patients perceived better continuity of primary care.	Health system (macro level)	6

– Table 2 to be continued –

No.	Hypothesis	Result	Level of analyses	Chapter
		+ = supported; +/- = partly supported - =not supported		
H10	Patients will experience better quality of care from their GP if they can build a more longstanding relationship with their GP due to a broader service profile.	+/- in countries where GPs have broader service profiles patients perceive better accessibility, continuity and comprehensiveness of care and more involvement in decision making. This is specifically true when GPs have broader service profiles in the areas of first contact care.	Service delivery and patient level (macro and meso level)	7

Theoretical considerations

Firstly, we found that in countries with pro-primary care conditions patients perceive more person-focused care (see Table 1, H9). The perceptions of patients were based on their experiences and values. We combined the experiences of patients and what they find important in a country into the "improvement potential". In this measure we took the percentage of negative experiences and weighted this by the importance attached to it in a country. If an issue such as the GP making eye contact was considered less important, the weighting attached to it was also lower.

When studying the values and experiences of patients, it should be noted that people may judge importance by what they have already experienced in healthcare. For example, when practitioners in a country perform poorly on a certain aspect, patients might have lower expectations and find this aspect less important. Experiences and values of patients have been found to be correlated, perhaps because patients seek healthcare providers who deliver care according to their values [42]. For our findings it would mean that the relationship between the strength of primary care and the patient-perceived improvement potential is underestimated. This is because it can be expected that patients would have higher expectations in countries with strong primary care, whereas they would have lower expectations in countries with weak primary care. Negative experiences are therefore most likely to have low weightings in countries with weak primary care, as these issues were considered less important, and consequently we found a lower improvement potential in these countries.

Secondly, we found that patients perceive better quality of care when GPs offer a broader range of services (see Table 1, H10). While higher involvement of GPs in first contact care is related to most of the areas of quality studied, broad service profiles in terms of minor technical procedures were only found to be related to the perceived accessibility. In addition, variation in the perceived communication could not be explained by the breadth of GP service profiles. Communication with GPs is generally perceived as good by the patients in the countries included in this study [42]. A broad range of services offered in primary care is found to be associated not only with better outcomes in terms of improved health [16,17,43,44] and lower hospital admission rates for

primary care sensitive conditions [16,17], but also with higher rates of hospital admissions for uncontrolled diabetes [45] and reduced disparities in health [46]. Our study adds to current knowledge by showing that the range of services provided in primary care is positively associated with patient-perceived quality of care. Previously, international studies have mainly focused on the relationship between the organization of the GP practice and experiences of patients (e.g. [20, 47]). To our knowledge, few studies have been carried out into the relationship between the range of services offered in primary care and the evaluations of patients. A study performed in Canada found an increase in patient-reported continuity when GPs performed more medical procedures [48]. As it is not clear what kind of medical procedures this included, we do not know exactly how these results relate to our findings.

Reflection of the methodology used in this thesis

The methodology used in this thesis needs to be examined, in terms of: the causality, the multilevel design and the study population.

Causality

The design of our study does not make causal inferences possible. As it concerns a cross-sectional survey, the directions of the associations are uncertain. For example, we found an association between stronger growth in healthcare expenditures in a country and the extent to which service profiles of European GPs have expanded over recent decades. We cannot speak of a causal effect, but merely of the association found. Maybe the growth in case that expenditure influenced the changes in GP service profiles, or that the changes in GP service profiles led to increases in influenced healthcare expenditure.

Nevertheless, the hypotheses tested in this thesis are mostly based on findings from previous studies on primary care. Additionally, the comparisons of the breadth of GP task profiles between 1993 and 2012 are based on a repeated measurement, as the same questions were used in both studies.

Multilevel design

The study design was set up in such a way that multilevel analyses could be performed, including three levels: the country, the GP practice and the patient. Not only did this make analysis possible of the potential influence of country-level variables, but we were also able to link characteristics of GPs to outcomes as perceived by patients. To our knowledge, there are no comparable studies of health service delivery in primary care that include this multilevel design. More specifically, this approach let us evaluate the relationship between the breadth of GP service profiles and assessments on quality as perceived by patients on a large scale.

A large number of countries (34) were included in this study. This allowed us to study the influence of country characteristics on outcomes at the GP practice and patient levels. However, only two variables related to country characteristics could be included in these analyses at the same time. Although the numbers of GPs and patients are large, the number of observations at the country level determines the number of variables that can be included at this level. In this respect, 34 countries is only a limited number.

This study was based on surveys among GPs and patients in European and non-European countries. Even though the countries have been treated as separate units of analysis, it must be noted that the European countries in particular are not independent of each other. This is also known as Galton's problem. Countries have common borders, which means that they can influence each other. The countries included are mostly members of the European Union, which may also have influenced developments in health services [30]. We did not analyse potential spatial auto-correlated relationships in this study. On the other hand, the countries studied are easier to compare because most are European Union countries, therefore having at least some institutions and regulations in common.

Study population

Assessments by patients are an important part of this thesis. The questionnaires were completed by patients who actually visited practices. The sampling of patients took place in the GP practices; a field worker asked patients who were visiting the practice to complete a

questionnaire after their consultation. Our samples are therefore representative for patients visiting GP practices and not for whole populations. A potential limitation of this is that we did not include patients who did not have access to practices. It is therefore expected that results about the accessibility of GP practices are overestimated. However, measuring perceived quality based on actual visits, directly after the consultation, may be the most precise way to measure accessibility and interpersonal communication [49].

For this study, GPs were selected as the main providers of primary care. However, in some of the countries studied, primary care is offered by other providers as well [42]. Additionally, although the median participation rate was 30%, the response rate of GPs was below 10% in some countries. This has probably affected the generalizability of the results in those particular countries. It is likely that GPs in these countries who participated are more interested in research and development of their occupation. We did find that the participating GPs are representative in terms of age and gender for the population of GPs in their country [50].

Implications

Implications for policy makers

The results of this study can be used not only by international organisations, such as the European Union and WHO, but particularly also by national policy makers. The deeper insights into the elements of the structure and organisation of primary care that are related to the process quality in terms of GP service profiles and the patient-perceived quality can be used for supporting healthcare policy measures.

International organisations have backed the notion of strong primary care for improving health system performance over recent decades. This study provides new evidence that strong primary care benefits the quality of care and can therefore be used to support the vision of the international organisations. In countries where the national primary care structures are stronger, GPs have broader service profiles and patients' assessments are more positive. Moreover, patients experience better quality of care if their GP has a broader service profile. The study also

shows on the one hand that GPs in Europe have been able to strengthen primary care by broadening service profiles but, on the other, involvement in prevention generally decreased. This may be a clear sign for international organisations that there is a substantial need for more promotion of preventive activities.

This information can also be useful for national decision makers. The results of this study provide specific insights into changes in GP service profiles in recent decades. Furthermore, the study can provide guidance for developing training programmes for GPs, as it provides an overview of the services which are and are not provided in the various countries. National decision makers should consider what is behind the decrease in preventive activities and whether this role should be strengthened again. It is not likely that these tasks are currently carried out in all countries by other professionals outside the GP practice [30].

In countries where GP practices are a one-stop shop, patients perceive better quality of care, especially in the areas of accessibility and continuity of care. General practice in a country can therefore be expected to benefit from investments in broader GP service profiles. This can be achieved through implementation in (continuous) education programmes, or by ensuring proper incentives for GP practices for the time and efforts they need to invest in offering a broad range of services [51].

The results also show the importance of strong economic conditions for primary care, as this is related to more positive assessments of patients. In countries where decision makers want to improve the quality of care as perceived by patients, they can focus on strengthening their primary care structure in this area. Good economic conditions for primary care are for example about good insurance coverage for primary care services and higher expenditure on primary care as a percentage of total expenditure on healthcare. Moreover, GPs have broader service profiles in countries with stronger primary care structures. This means that if national governments invest in their primary care structures, e.g. by supporting pro-primary care workforce development, this will help GPs strengthen their role in the healthcare system.

Implications for practice

Two decades ago, prevention and health education were not the major focus of general practices in Europe. At the time, it was expected that need for preventive services would grow [52]. Since then, however, GPs have become even less involved in these activities. This study does not tell us whether there is lower availability of these preventive services in those countries, or whether these activities have been taken up by other healthcare providers. As described above, it is not likely always to be the case that other providers have taken up these activities. Today, the need for a more outreaching attitude of GPs is even more essential, as this will make it possible to detect health problems early on and provide preventive care if needed. Populations in European countries have aged. The relative and absolute increases in frail elderly populations require community-oriented primary care to ensure that their health needs are not neglected. Even though this is often recognized, evidence from this study shows that prevention, which can be an indicator for an outreaching practice, still requires more attention today in general practice. The involvement of GPs in this area is expected to be positively influenced by routinely keeping a comprehensive medical records system. There is wide variation of whether GPs routinely keep their records and many countries and GP practices (and eventually their patients) can benefit from improvements in this area.

GPs in central and eastern European countries have come a long way in strengthening their position. In most countries (but not all) they have been able to create a solid position with a fairly comprehensive service profile. While the assessments of their patients were also generally positive, we found that patients in eastern European countries would like to be more involved in making decisions about their treatment.

Furthermore, patients in most countries indicated that they wanted to discuss more problems during the consultation, including psychosocial problems. If GPs want to improve the relationship with their patients and potentially gain a better picture of their care needs, they could therefore pay extra attention to these aspects. Recent analyses indicate that this may however require more time investments in terms of longer consultations and more working hours for GPs [53]. In various countries, this may be a potential barrier for GPs. This could be partly solved by

training more GPs in or by delegating tasks to other professionals in the primary care practice.

Since 1993, GPs in most European countries have acquired broader service profiles. Having more tasks potentially also influences the workload. Recently it was found that the changes in GP service profiles between 1993 and 2012 were only related to changes in the workloads of GPs to a very limited extent [54]. This could indicate that certain tasks have been taken over by other disciplines in the primary care practice.

Future research

This thesis is part of a broader study into the performance of primary care. We focused on the process quality in terms of the breadth of GP service profiles and the patients' perceived quality of primary care. We also examine other aspects in the broader QUALICOPC study, including process quality, equity in patient experiences, costs and avoidable hospitalizations. The analyses of avoidable hospitalizations indicate that strong primary care is not necessarily related to lower rates of avoidable hospitalizations, but that there may be other aspects of the healthcare systems that are more relevant [45]. However, it was also found that accessible and continuous primary care may help reduce rates of emergency department use [55]. To come to a conclusion about the potential benefits of strong primary care, we need to take account of all outcomes and potential trade-offs between improvements in one area but no improvements in other areas. For example, it may be that investments in broader GP service profiles lead to better patient experiences but also to higher healthcare costs. Further research will focus on combining findings concerning the various topics studied in the QUALICOPC project.

In general, the data collected in this study can also be used to study specific issues in a country, allowing it to be analysed in an international context. For example, a study was recently conducted into the workload and service profiles of general practitioners in the Netherlands [56]. Researchers from other countries have also made efforts to study country-specific issues [57-62]. Further national studies may also focus on issues based on findings from this study. For example, there could be a study of how patients in central and eastern European can be more involved in decisions about treatment during the consultation. It should

be noted that the bulk of the data was collected in 2012. Since then, countries have gone through specific reforms that may have changed certain aspects of the outcomes. For the Netherlands it was for example found that there was a decrease in GPs' involvement in psychosocial issues between 1993 and 2012. However, other studies have shown that since the data was collected in 2012, Dutch GPs have again become more involved in psychosocial issues [56].

In this study, the performance of primary care is only measured at one point in time. However, it is important that the performance of primary care is also monitored in the longer term. The comparisons with GP service profiles from 1993 have shown that measurements over time may lead to new insights into changes. Health systems are continuously developing and this affect the organization and outcomes of primary care. Moreover, the expectations of patients can change over time. It may be that in the future they will value different aspects of primary care delivery more highly. A final important aspect related to the changes in primary care may be the changes in other parts of the healthcare system. It is for example also relevant to look at the consequences of broader GP service profiles for secondary care.

In this study we focused on the GP as the main provider of primary care. However, primary care in modern GP practices is often also delivered by other providers such as nurses. Future research should focus also on other providers within primary care. This may provide better insights into all services as a whole that are provided within primary care.

Finally, surveys were held in this study among GPs and patients in western and (mainly) high-income countries. Results about the relationships studied cannot be generalized to lower-income countries. Currently, the surveys of the QUALICOPC study are also being implemented in Malaysia, a non-western upper to middle-income country with a completely different context. This study may provide more insights in the relationships between different facets of primary care and their outcomes in non-western countries.

References

- 1 Macinko J, Starfield B, Shi L. The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970-1998. *Health ServRes* 2003;38(3):831-65.
- 2 Delnoij D, Van Merode G, Paulus A, et al. Does general practitioner gatekeeping curb health care expenditure? *JHealth ServResPolicy* 2000;5(1):22-26.
- 3 Shi L, Starfield B, Politzer R, et al. Primary care, self-rated health, and reductions in social disparities in health. *Health services research* 2002;37(3):529-50.
- 4 Shi L, Macinko J, Starfield B, et al. Primary care, social inequalities and all-cause, heart disease and cancer mortality in US counties: a comparison between urban and non-urban areas. *Public Health* 2005;119(8):699-710.
- 5 Starfield B. Is primary care essential? *Lancet* 1994; 344(8930):1129-33.
- 6 Friedberg MW, Hussey PS, Schneider EC. Primary care: a critical review of the evidence on quality and costs of health care. *Health Aff(Millwood)* 2010;29(5):766-72.
- 7 Weiss LJ, Blustein J. Faithful patients: the effect of long-term physician-patient relationships on the costs and use of health care by older Americans. *AmJPublic Health* 1996;86(12):1742-47.
- 8 Franks P, Fiscella K. Primary care physicians and specialists as personal physicians. Health care expenditures and mortality experience. *JFamPract* 1998;47(2):105-09.
- 9 Mark DH, Gottlieb MS, Zellner BB, et al. Medicare costs in urban areas and the supply of primary care physicians. *JFamPract* 1996;43(1):33-39.
- 10 Parchman ML, Culler S. Primary care physicians and avoidable hospitalizations. *JFamPract* 1994;39(2):123-28.
- 11 Parchman ML, Noel PH, Lee S. Primary care attributes, health care system hassles, and chronic illness. *Med Care* 2005(43):1123-29.

- 12 Forrest CB, Starfield B. The effect of first-contact care with primary care clinicians on ambulatory health care expenditures. *JFamPract* 1996;43(1):40-48.
- 13 Starfield B, Shi L, Grover A, et al. The effects of specialist supply on populations' health: assessing the evidence. *Health Aff(Millwood)* 2005;Suppl Web Exclusives:W5-97-W5-107.:W5-W5.
- 14 Lee A, Kiyu A, Milman HM, et al. Improving health and building human capital through an effective primary care system. *JUrbanHealth* 2007;84(3 Suppl):i75-i85.
- 15 Kringos DS, Boerma WG, Hutchinson A, et al. The breadth of primary care: a systematic literature review of its core dimensions. *BMC health services research* 2010;10:65.
- 16 Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q* 2005;83(3):457-502 doi: MILQ409 [pii];10.1111/j.1468-0009.2005.00409.x [doi][published Online First: Epub Date].
- 17 Kringos DS, Boerma W, Van der Zee J, et al. Europe's strong primary care systems are linked to better population health but also to higher health spending. *Health Aff(Millwood)* 2013;32(4):686-94 doi: 32/4/686 [pii];10.1377/hlthaff.2012.1242 [doi][published Online First: Epub Date].
- 18 Hansen J, Groenewegen PP, Boerma WG, et al. Living In A Country With A Strong Primary Care System Is Beneficial To People With Chronic Conditions. *Health affairs* 2015;34(9):1531-7 doi: 10.1377/hlthaff.2015.0582 [published Online First: Epub Date].
- 19 Boerma WG, van der Zee J, Fleming DM. Service profiles of general practitioners in Europe. European GP Task Profile Study. *The British journal of general practice : the journal of the Royal College of General Practitioners* 1997;47(421):481-6.
- 20 Wensing M, Hermsen J, Grol R, et al. Patient evaluations of accessibility and co-ordination in general practice in Europe. *Health expectations : an international journal of public participation in health care and health policy* 2008;11(4):384-90 doi: 10.1111/j.1369-7625.2008.00507.x [published Online First: Epub Date].

- 21 Osborn R, Moulds D, Schneider EC, et al. Primary Care Physicians In Ten Countries Report Challenges Caring For Patients With Complex Health Needs. *Health affairs* 2015;34(12):2104-12 doi: 10.1377/hlthaff.2015.1018 [published Online First: Epub Date].
- 22 Boerma WG, Snoeijs S, Wiegers TA, et al. Evaluation of the structure and provision of primary care in the Republic of Moldova. Copenhagen, Denmark: WHO Regional Office for Europe 2012.
- 23 Groenewegen PPD, J; Boerma, WG. The regulatory environment of general practice: an international perspective. In: Saltman RBB, R; Mossialos E, ed. *Regulating entrepreneurial behaviour in European health care systems*. Buckingham Philadelphia: Open University Press, 2002.
- 24 Kringos DS, Boerma WG, Bourgueil Y, et al. The European primary care monitor: structure, process and outcome indicators. *BMC Fam Pract* 2010;11:81 doi: 1471-2296-11-81 [pii];10.1186/1471-2296-11-81 [doi][published Online First: Epub Date].
- 25 Shi L, Starfield B, Xu J. Validating the Adult Primary Care Assessment Tool. *The Journal of Family Practice* 2001;50(2):161-75.
- 26 Boerma WG, Van der Zee J, Fleming DM. Service profiles of general practitioners in Europe. *European GP Task Profile Study*. *BrJGenPract* 1997;47(421):481-86.
- 27 Kringos DS, Boerma WG, Hutchinson A, et al. The breadth of primary care: a systematic literature review of its core dimensions. *BMCH Health Serv Res* 2010;10:65 doi: 1472-6963-10-65 [pii];10.1186/1472-6963-10-65 [doi] [published Online First: Epub Date].
- 28 Delnoij DM, Rademakers JJ, Groenewegen PP. The Dutch consumer quality index: an example of stakeholder involvement in indicator development. *BMC health services research* 2010;10:88 doi: 10.1186/1472-6963-10-88[published Online First: Epub Date].
- 29 Sixma HJ, Van Campen C, Kerssens JJ, et al. Quality of care from the perspective of elderly people: the QUOTE-elderly instrument. *Age Ageing* 2000;29(2):173-78.

- 30 Schäfer WLA, Boerma WGW, Spreeuwenberg P, et al. Two decades of change in European general practice service profiles: conditions associated with the developments in 28 countries between 1993 and 2012. *Scandinavian Journal of Primary health Care* 2016.
- 31 Kringos DS, Boerma WG, van der Zee J, et al. Political, cultural and economic foundations of primary care in Europe. *Social science & medicine* 2013;99:9-17 doi: 10.1016/j.socscimed.2013.09.017[published Online First: Epub Date].
- 32 Greß SB, C; Calnan, M; Dedeu, T; Groenewegen, P; Howson, H; Maroy, L; Nolte, E; Redaelli, M; Saarelma, O; Schmacke, N; Schumacher, K; van Lente, EJ; Vrijhoef, B;. *Coordination and Management of Chronic Conditions in Europe – The Role of Primary Care. Position Paper 2008.* 2008.
- 33 Marrée J, Groenewegen PP. *Back to Bismarck: Eastern European Health Care Systems in Transition.* Avebury, 1997.
- 34 Saltman RB; Figueras J. *European health care reform: analysis of current strategies.* Copenhagen: WHO Regional Office for Europe, 1997.
- 35 McKee M; Healy J; Falkingham J. *Health care in central Asia.* Buckingham: Open Press University, 2002.
- 36 Boerma WGW, Dubois CA. Mapping primary care across Europe. In: Saltman RB, Rico A, Boerma WGW, eds. *Primary care in the driver's seat? Organizational reform in European primary care.* Berkshire: Open University Press, 2006:22-47.
- 37 Groenewegen PP, Dourgnon P, Greß S, et al. Strengthening weak primary care systems: steps towards stronger primary care in selected western and eastern European countries. *Health Policy* 2013(113):170-79.
- 38 Seifert B, Svab I, Madis T, et al. Perspectives of family medicine in Central and Eastern Europe. *FamPract* 2008; 25(2):113-18 doi: cmn009 [pii]; 10.1093/fampra/cmn009 [doi] [published Online First: Epub Date].
- 39 Nelson BD, Simic S, Beste L, et al. Multimodal assessment of the primary healthcare system of Serbia: a model for evaluating post-conflict health systems. *Prehospital and disaster medicine* 2003;18(1):6-13.

- 40 Boerma WG, Groenewegen PP, Van der Zee J. General practice in urban and rural Europe: the range of curative services. *Social science & medicine* 1998;47(4):445-53.
- 41 Groenewegen PP, Hansen J, ter Bekke S. Ontwikkelingen op het gebied van de professies [Developments in the area of the professions]. *Professies en de toekomst [Professions and the future]*. Utrecht: Springer Uitgeverij BV, 2007.
- 42 Schäfer WLA, Boerma GW, Murante AM, et al. Assessing the potential for improvement of primary care in 34 countries: a cross-sectional survey. *Bulletin of the World Health Organization* 2015;93(3):161-8 doi: 10.2471/BLT.14.140368[published Online First: Epub Date].
- 43 Sans-Corrales M, Pujol-Ribera E, Gene-Badia J, et al. Family medicine attributes related to satisfaction, health and costs. *Family practice* 2006;23(3):308-16 doi: 10.1093/fampra/cmi112[published Online First: Epub Date].
- 44 Wilhelmsson S, Lindberg M. Prevention and health promotion and evidence-based fields of nursing - a literature review. *International journal of nursing practice* 2007;13(4):254-65 doi: 10.1111/j.1440-172X.2007.00635.x[published Online First: Epub Date].
- 45 Van Loenen T, Faber MJ, Westert GP, et al. The impact of primary care organization on avoidable hospital admissions for diabetes in 23 countries. *Scandinavian journal of primary health care* 2016;34(1):5-12 doi: 10.3109/02813432.2015.1132883 [published Online First: Epub Date].
- 46 Starfield B. State of the art in research on equity in health. *Journal of health politics, policy and law* 2006;31(1):11-32 doi: 10.1215/03616878-31-1-11[published Online First: Epub Date].
- 47 Heje HN, Vedsted P, Sokolowski I, et al. Doctor and practice characteristics associated with differences in patient evaluations of general practice. *BMC health services research* 2007;7:46 doi: 10.1186/1472-6963-7-46[published Online First: Epub Date].

- 48 Haggerty JL, Pineault R, Beaulieu MD, et al. Practice features associated with patient-reported accessibility, continuity, and coordination of primary health care. *Annals of family medicine* 2008;6(2):116-23 doi: 10.1370/afm.802[published Online First: Epub Date].
- 49 Haggerty J. Measurement of primary healthcare attributes from the patient perspective. *Health Policy* 2011;7(Spec Issue):13-20.
- 50 Groenewegen PP, Greß S, Schäfer W. General practitioners' participation in a large, multi-country combined general practitioner – patient survey: recruitment procedures and participation rate. *International Journal of Family Medicine* 2016;2016:1-9.
- 51 Grumbach K. To be or not to be comprehensive. *Annals of family medicine* 2015;13(3):204-5 doi: 10.1370/afm.1788[published Online First: Epub Date].
- 52 Boerma WGW. Summary and conclusions. Profiles of General Practice in Europe: An international study of variation in the tasks of general practitioners. Utrecht: NIVEL, 2003.
- 53 Schäfer WLA, Van den Berg MJ, Groenewegen PP. Determinants of the workload of GPs. Paper under preparation 2016.
- 54 Schäfer WLA, Van den Berg MJ, van Hassel D, et al. De werkbelasting van huisartsen in 1993 en 2012: Nederlandse huisartsen in Europees perspectief [The workload of GPs in 1993 and 2012: Dutch GPs in European perspectives]. Paper submitted 2016.
- 55 van den Berg MJ, van Loenen T, Westert GP. Accessible and continuous primary care may help reduce rates of emergency department use. An international survey in 34 countries. *Fam Pract* 2016;33(1):42-50 doi: 10.1093/fampra/cmz082[published Online First: Epub Date].
- 56 Schäfer WLA, Van den Berg MJ, PP G. De werkbelasting van huisartsen in internationaal perspectief [The workload of GPs in international perspective]. *Huisarts en Wetenschap* 2016;59(3):94-101.

- 57 Rumball-Smith J, Wodchis WP, Kone A, et al. Under the same roof: co-location of practitioners within primary care is associated with specialized chronic care management. *BMC family practice* 2014;15:149 doi: 10.1186/1471-2296-15-149[published Online First: Epub Date].
- 58 Pullicino G, Sciortino P, Calleja N, et al. Comparison of patients' experiences in public and private primary care clinics in Malta. *European journal of public health* 2015;25(3):399-401 doi: 10.1093/eurpub/cku188[published Online First: Epub Date].
- 59 Kert S, Svab I, Sever M, et al. A cross-sectional study of socio-demographic factors associated with patient access to primary care in Slovenia. *International journal for equity in health* 2015;14:39 doi: 10.1186/s12939-015-0166-y[published Online First: Epub Date].
- 60 Cohidon C, Cornuz J, Senn N. Primary care in Switzerland: evolution of physicians' profile and activities in twenty years (1993-2012). *BMC family practice* 2015;16:107 doi: 10.1186/s12875-015-0321-y[published Online First: Epub Date].
- 61 Hoffmann K, Wojczewski S, George A, et al. Stressed and overworked? A cross-sectional study of the working situation of urban and rural general practitioners in Austria in the framework of the QUALICOPC project. *Croatian medical journal* 2015;56(4):366-74.
- 62 Hoffmann K, George A, Dorner TE, et al. Primary health care teams put to the test a cross-sectional study from Austria within the QUALICOPC project. *BMC family practice* 2015;16:168 doi: 10.1186/s12875-015-0384-9[published Online First: Epub Date].

Summary

This thesis aimed to evaluate primary care service delivery by general practitioners (GPs) in 34 countries. Strong primary care is expected to meet the current challenges of healthcare systems which are facing increasing numbers of people with chronic diseases and rising healthcare costs. The study distinguished between the perspectives of patients and GPs. The thesis is written in the context of the international study 'Quality and Costs of Primary Care in Europe' (QUALICOPC). The countries studied include 26 EU member states as well as Australia, Canada, Iceland, FYR Macedonia, New Zealand, Norway, Switzerland and Turkey.

It was examined how differences within and between countries in the strength of primary care (in terms of the breadth of GP service profiles) could be explained and how they are related to outcomes as perceived by patients. The main question of this thesis is:

How can we explain differences within and between countries in the strength of primary care in terms of the breadth of GP services profiles, and how does this relate to assessments by patients?

To answer the main question, the following sub-questions were formulated:

- 1) *How can primary care service delivery by GPs be evaluated?*
- 2) *How can differences in and between countries in the breadth of GP service profiles be explained?*
- 3) *How are the differences in the strength of primary care associated with patients' assessments of primary care?*

This chapter summarizes the results for these three research questions.

- 1) *How can primary care service delivery by GPs be evaluated?*

This question was addressed in the first part of this thesis (Chapters 2 and 3), in which the design and measurement instruments of the QUALICOPC study are described. The QUALICOPC (Quality and Costs of Primary Care in Europe) study aims to evaluate the performance of primary care systems in Europe in terms of quality, equity and costs. QUALICOPC is co-funded by the European Commission under the "Seventh Framework Programme". Between 2011 and 2013 data was

collected in 31 European countries (26 EU countries, Iceland, FYR Macedonia, Norway, Switzerland and Turkey) and in Australia, Canada and New Zealand. This study uses a three level approach of data collection: the primary care system, GP practice and patient. Surveys were held among general practitioners (GPs) and their patients, providing evidence at the process and outcome level of primary care. The surveys aimed to gain insight in the professional behaviour of GPs and the expectations and experiences of their patients. An important aspect of this study is that each patient's questionnaire can be linked to their own GP's questionnaire. To gather data at the structure or national level, we used existing data sources such as the Primary Health Care Activity Monitor Europe (PHAMEU) database. Analyses of the data were performed using multilevel models. By its design, in which different data sources are combined for comprehensive analyses, QUALICOPC can advance the state of the art in primary care research and contribute to the discussion on the merit of strengthening primary care systems and to evidence based health policy development.

The development of the questionnaires consisted of four phases: a search for existing validated questionnaires, the classification and selection of relevant questions, shortening of the questionnaires in three consensus rounds and the pilot survey. Consensus was reached on the basis of exclusion criteria (e.g. the applicability for international comparison). Based on the pilot survey, comprehensibility increased and the number of questions was further restricted, as the questionnaires were too long. Four questionnaires were developed: one for GPs, one for patients about their experiences with their GP, another for patients about what they consider important, and a practice questionnaire. The GP questionnaire mainly focused on the structural aspects (e.g. economic conditions) and care processes (e.g. comprehensiveness of services of primary care). The patient experiences questionnaire focused on the care processes and outcomes (e.g. how do patients experience access to care?). The questionnaire about what patients consider important was complementary to the experiences questionnaire, as it enabled weighing the answers from the latter. Finally, the practice questionnaire included questions on practice characteristics. By means of these four questionnaires, data can be collected showing in detail the variation in

process and outcomes of primary care and explaining the differences from features of the (primary) care system.

2) How can differences in and between countries in the breadth of GP service profiles be explained?

This question was addressed in the second part of this thesis (Chapters 4 and 5). Chapter 4 focuses on changes in the breadth of services provided by general practitioners (GPs) in Europe between 1993 and 2012 and offers possible explanations for these changes. Data on the breadth of service profiles were used from the 1993 European GP Task Profile study and the 2012 QUALICOPC study. GPs' involvement in four areas of clinical activity (first contact care, treatment of diseases, medical procedures, and prevention) was established using econometric analyses. The changes were measured by the relative increase in the breadth of service profiles. Associations between changes and national-level conditions were examined through regression analyses. Data on the national conditions were used from various other public databases including the World Databank and the PHAMEU (Primary Health care Activity Monitor) database. A general trend of increased involvement of European GPs in treatment of diseases and decreased involvement in preventive activities was observed. Conditions at the national level were associated with changes in the involvement of GPs in first contact care, treatment of diseases and, to a limited extent, prevention. Especially in countries with stronger growth of health care expenditures between 1993 and 2012 the service profiles have expanded. In countries where family values are more dominant the breadth in service profiles decreased. A stronger professional status of GPs was positively associated with the change in first contact care. GPs in former communist countries and Turkey have increased their involvement in the provision of services. Developments in Western Europe were less evident. The developments in the service profiles could only to a very limited extent be explained by national conditions. A main driver of reform seems to be the changes in health care expenditure, which may indicate a notion of urgency because there may be a pressure to curb the rising expenditures.

Chapter 5 aims to gain insight into which organisational characteristics at the national and GP practice level can facilitate broader GP service profiles. We used the QUALICOPC data on 7,183 GPs in 31 European

and 3 non-European countries. Linear multilevel regression models were used to calculate the regression coefficients of the organisational characteristics at the national and GP practice level. In countries with a stronger national primary care structure GPs have broader service profiles in the areas of first contact care, treatment of chronic diseases and technical procedures, but not regarding preventive services. If GPs have a more community orientated vision, more medical instruments in the practice, collaborate more with other primary care providers and when out-of-hours care is delivered only within primary care they have broader service profiles in all areas. Preventive services are also facilitated by routine medical record keeping. Self-employed GPs have broader service profiles, except for preventive services compared to salaried GPs. Also, in comparison to GPs working in urban areas, GPs working in rural areas have broader service profiles, except for preventive services. Preventive activities are influenced by the organisational characteristics only to a limited extent. The current view of what a strong primary care structure entails does not seem to promote preventive activities.

3) How are the differences in the strength of primary care associated with patients' assessments of primary care?

This question was addressed in the third part of this thesis (Chapters 6 and 7). In Chapter 6 we investigate patients' perceptions of improvement potential in primary care in 34 countries. We used the QUALICOPC data of 69 201 patients who had visited general practitioners at primary-care facilities. Patients rated five features of person-focused primary care accessibility/availability, continuity, comprehensiveness, patient involvement and doctor-patient communication. One tenth of the patients ranked the importance of each feature on a scale of one to four, and nine tenths of patients scored their experiences of care received. We calculated the potential for improvement by multiplying the proportion of negative patient experiences with the mean importance score in each country. Scores were divided into low, medium and high improvement potential. Pair-wise correlations were made between improvement scores and three dimensions of the structure of primary care – governance, economic conditions and workforce development. In 26 countries, one or more features of primary care had medium or high

improvement potentials. Comprehensiveness of care had medium to high improvement potential in 23 of 34 countries. In all countries, doctor–patient communication had low improvement potential. An overall stronger structure of primary care was correlated with a lower potential for improvement of continuity and comprehensiveness of care. In countries with stronger primary care governance patients perceived less potential to improve the continuity of care. Countries with better economic conditions for primary care had less potential for improvement of all features of person-focused care.

In Chapter 6 we studied how a broad range of services offered by GPs may contribute to the quality as perceived by patients and, hence, the potential benefits of primary care. We used the GP and patient data collected in the QUALICOPC study. Data of the patients were linked to the data of the GPs. Multilevel modelling was used to construct scale scores for the experiences of patients in the five areas of quality and the breadth of the service profiles of GPs. In these four-level models items were nested within patients, nested in GP practices, nested in countries. The relationship between the breadth of service profiles and the experiences of patients were analysed in three-level multilevel models, also taking into account the values of patients. In countries where GPs have broader service profiles patients perceive better accessibility, continuity and comprehensiveness of care and more involvement in decision making. No associations were found between the breadth of GP service profiles and the patient perceived communication with their GP. The breadth of GP service profiles could mostly explain the variation between countries in the areas of patient perceived accessibility and continuity of care. This study showed that in countries where GP practices serve as a ‘one stop shop’, patients perceive better quality of care, especially in the areas of accessibility and continuity of care.

Samenvatting
(summary in Dutch)

Dit proefschrift had als doel het evalueren van eerstelijnsgezondheidszorg geleverd door huisartsen in 34 landen. Er wordt verwacht dat een sterke eerstelijns oplossing biedt voor de huidige uitdagingen van gezondheidszorgsystemen, zijnde een toename in het aantal mensen met een chronische ziekte en stijgende kosten van de gezondheidszorg. De studie maakt onderscheid tussen de perspectieven van patiënten en van huisartsen. Het proefschrift is geschreven in de context van de internationale studie 'Quality and Costs of Primary Care in Europe' (QUALICOPC). De onderzochte landen betreffen 26 lidstaten van de EU en Australië, Canada, IJsland, Macedonië, Nieuw-Zeeland, Noorwegen, Turkije en Zwitserland.

Het is onderzocht hoe verschillen in de sterkte van de eerstelijns binnen en tussen landen (in termen van de breedte van taakprofielen van huisartsen) verklaard kunnen worden en hoe deze relateren aan uitkomsten zoals ervaren door patiënten. De hoofdvraag van dit proefschrift is:

Hoe kunnen we verschillen, tussen en binnen landen, in de sterkte van de eerstelijns, in termen van de breedte van taakprofielen van huisartsen, verklaren, en hoe relateert dit aan beoordelingen door patiënten?

Om deze hoofdvraag te kunnen beantwoorden, zijn de volgende deelvragen geformuleerd:

- 1) *Hoe kan eerstelijnsgezondheidszorg worden geëvalueerd?*
- 2) *Hoe kunnen verschillen binnen en tussen landen in de breedte van taakprofielen van huisartsen worden verklaard?*
- 3) *Hoe zijn de verschillen in de sterkte van de eerstelijns gerelateerd aan beoordelingen van de eerstelijns door patiënten?*

In dit hoofdstuk worden de resultaten rondom deze drie onderzoeksvragen samengevat.

- 1) *Hoe kan eerstelijnsgezondheidszorg worden geëvalueerd?*

Deze vraag werd beantwoord in het eerste deel van dit proefschrift (hoofdstukken 2 en 3), waarin de onderzoeksopzet en de meetinstrumenten van de QUALICOPC studie zijn beschreven. De QUALICOPC (Quality and Costs of Primary Care in Europe) studie heeft

als doel de prestaties van de eerstelijnsgezondheidszorg in Europe te evalueren in termen van kwaliteit, 'equity' en kosten. QUALICOPC wordt medegefinancierd door de Europese Commissie binnen het "Zevende Kader Programma". Tussen 2011 en 2013 is er data verzameld in 31 Europese landen (26 EU lidstaten, IJsland, Macedonië, Noorwegen, Turkije en Zwitserland) en in Australië, Canada en Nieuw Zeeland. Deze studie maakt gebruik van een dataverzameling op drie niveaus: het eerstelijnsstelsel, de huisartsenpraktijk en de patiënt. Er werd een vragenlijstsonderzoek gehouden onder huisartsen en hun patiënten om nieuwe wetenschappelijke inzichten te leveren op de niveaus van het proces en van de uitkomsten van de eerstelijnszorg.

Het vragenlijstsonderzoek richtte zich op het verkrijgen van inzichten in het professionele gedrag van huisartsen en de verwachtingen en ervaringen van hun patiënten. Een belangrijk aspect van deze studie is dat elke patiënt een vragenlijst gekoppeld kan worden aan de vragenlijst van hun huisarts. Om gegevens te verzamelen op structuur- of nationaal niveau, gebruikten we bestaande gegevensbronnen zoals de 'Primary Health Care Activity Monitor Europe' (PHAMEU) databank. Analyses van de data werden uitgevoerd met behulp van multilevel modellen. Door de onderzoeksopzet, waarin verschillende databronnen worden gecombineerd voor een veelomvattende analyse, kan QUALICOPC een bijdrage leveren aan de stand van zaken in het eerstelijnsonderzoek en een bijdrage leveren aan de discussie over de voordelen van het versterken van eerstelijnsgezondheidszorg en aan ontwikkelingen in beleidsvorming gebaseerd op wetenschappelijke inzichten.

De ontwikkeling van de vragenlijsten bestond uit vier fases: een literatuurstudie naar bestaande gevalideerde vragenlijsten, de classificatie en selectie van relevante vragen, het inkorten van de vragenlijsten in drie consensus rondes en een pilotstudie. Consensus werd bereikt op basis van exclusiecriteria (bijvoorbeeld de toepasbaarheid voor internationale vergelijking). Op basis van de pilotstudie werd de begrijpelijkheid vergroot en werd het aantal vragen verder beperkt, omdat de vragenlijsten te lang waren. Vier vragenlijsten werden ontwikkeld: een voor huisartsen, een voor patiënten omtrent hun ervaringen met hun huisarts, een andere voor patiënten over wat zij belangrijk vinden en een vragenlijst over de praktijk.

De huisartsenvragenlijst richt zich op structurele aspecten (bijvoorbeeld economische condities) en zorgprocessen (bijvoorbeeld de omvangrijkheid van de geleverde diensten). De vragenlijst over patiëntervaringen richt zich op zorgprocessen en uitkomsten (bijv. hoe ervaren patiënten de toegankelijkheid tot zorg?). De vragenlijst over wat patiënten belangrijk vinden was complementair aan de vragenlijst over ervaringen, omdat deze het mogelijk maakte de ervaringen te wegen. Tot slot, bevat de praktijkvragenlijst vragen over praktijkkarakteristieken. Met behulp van deze vier vragenlijsten, kan data worden verzameld die tot in detail de variatie in processen en uitkomsten van de eerstelijns laat zien en verklaringen geven voor verschillen in de eerstelijns gezondheidszorg.

2) Hoe kunnen verschillen binnen en tussen landen in de breedte van taakprofielen van huisartsen worden verklaard?

Deze vraag werd beantwoord in het tweede deel van dit proefschrift (hoofdstukken 4 en 5). Hoofdstuk 4 richt zich op veranderingen in de breedte van de taakprofielen van huisartsen tussen 1993 en 2012 en geeft mogelijke verklaringen voor deze veranderingen. Data over de breedte van de taakprofielen werden gebruikt vanuit de Europese huisartsen taakprofielen studie uit 1993 en de QUALICOPC studie uit 2012. Een maat voor de betrokkenheid van huisartsen op de gebieden van vier klinische activiteiten (de huisarts als eerste contactpunt, behandeling van patiënten met chronische ziekten, kleine technische en chirurgische verrichtingen en preventie) werd berekend met econometrische analyses. De veranderingen werden gemeten door de relatieve toenames in de breedte van de taakprofielen. Associaties tussen de veranderingen en condities op nationaal niveau werden onderzocht met regressieanalyses. Gebruikte data over de nationale condities kwamen uit andere publieke databanken zoals de 'World Databank' en de PHAMEU (Primary Health Care Activity Monitor Europe) databank. Bij Europese huisartsen is er een algemene trend waarneembaar van een toename in betrokkenheid in behandeling van patiënten met chronische ziekten en een afname in preventieve activiteiten. Condities op het nationale niveau zijn gerelateerd aan veranderingen van de betrokkenheid van huisartsen als eerste contactpunt, behandeling van patiënten met chronische ziekten en, in beperkte mate, preventie. Met name in landen met een sterkere toename in gezondheidszorguitgaven tussen 1993 en 2012 zijn de taakprofielen van huisartsen verbreed. In landen waar

familiewaarden dominanter zijn is de breedte van de taakprofielen afgenomen. Een sterkere professionele status van huisartsen was positief gerelateerd aan de veranderingen rondom de huisarts als eerste contactpunt. Huisartsen in de voormalig communistische landen en Turkije hebben hun taakprofielen verbreed. Veranderingen in west Europa waren minder evident. De veranderingen in de taakprofielen konden maar in beperkte mate door nationale condities worden verklaard. De belangrijkste drijfveer voor hervorming lijken de verandering in de gezondheidszorg-uitgaven te zijn, welke kunnen duiden op een notie van urgentie omdat er een druk kan bestaan om de stijgende zorguitgaven terug te dringen.

Hoofdstuk 5 richt zich op het verkrijgen van inzicht in welke organisatorische karakteristieken, op het nationale niveau en het niveau van de huisartsenpraktijk, bredere taakprofielen van huisartsen kunnen ondersteunen. We gebruikten de QUALICOPC gegevens over 7183 huisartsen in 31 Europese landen en 3 niet-Europese landen. Lineaire multilevel regressiemodellen werden gebruikt om de regressie-coëfficiënten van de organisatorische karakteristieken op nationaal en praktijkniveau te berekenen. In landen met een sterkere eerstelijnsstructuur hebben huisartsen bredere taakprofielen aangaande hun rol als eerste contactpunt, behandeling van patiënten met chronische ziekten en kleine technische en chirurgische verrichtingen, maar niet op het gebied van preventie. Huisartsen hebben bredere taakprofielen op alle gebieden wanneer zij een meer maatschappelijk gerichte visie hebben, meer medische instrumenten tot hun beschikking hebben, meer samenwerken met andere eerstelijnsaanbieders en wanneer zorg buiten kantooruren aan hun patiënten alleen binnen de eerstelijns wordt geboden. Preventieve zorg wordt ook gefaciliteerd wanneer de huisarts routinematig de medische dossiers bijhoudt. Zelfstandig gevestigde huisartsen hebben bredere taakprofielen vergeleken met gesalarieerde huisartsen, behalve op het gebied van preventie. In vergelijking met huisartsen werkzaam in stedelijke gebieden, hebben huisartsen in plattelandsgebieden bredere taakprofielen, behalve op het gebied van preventie. Het leveren van preventie wordt maar in beperkte mate door de organisatorische karakteristieken bepaald. De huidige visie op wat een sterke lijn met zich mee brengt, lijkt preventieve activiteiten niet te bevorderen.

3) *Hoe zijn de verschillen in de sterkte van de eerstelijns gerelateerd aan beoordelingen van de eerstelijns door patiënten?*

Deze vraag werd beantwoord in het derde deel van dit proefschrift (hoofdstukken 6 en 7). In hoofdstuk 6 onderzochten we de percepties van patiënten over het verbeterpotentieel van de eerstelijns in 34 landen. We gebruikten de QUALICOPC gegevens over 69 201 patiënten die een huisartsenconsult binnen een eerstelijnsfaciliteit hadden gehad. Patiënten beoordeelden vijf kenmerken van een persoonsgerichte eerstelijnszorg: toegankelijkheid en beschikbaarheid, continuïteit, veelomvattendheid, betrokkenheid van patiënten en arts-patiënt communicatie. Een tiende van de patiënten beoordeelde het belang van elk kenmerk op een schaal van een tot vier, en negen tiende van de patiënten beoordeelden hun ervaringen met de zorg die zij hadden ontvangen. We berekenden het verbeterpotentieel door een vermenigvuldiging van de proporties van negatieve patiëntervaringen met de gemiddelde belangscore in elk land. De uitkomsten werden verdeeld in laag, gemiddeld en hoog verbeterpotentieel. Correlaties werden berekend tussen de verbetercores en drie dimensies van de structuur van de eerstelijns – het overheidsbeleid en de sturing van de eerste lijn ('governance'), de economische condities waarbinnen de eerste lijn functioneert en de menskracht waarmee de eerste lijn zijn taken vervult. In 26 landen hadden een of meer kenmerken van de eerstelijns een gemiddeld of hoog verbeterpotentieel. Omvattendheid van zorg had een gemiddeld tot hoog verbeterpotentieel in 23 van de 34 landen. In alle landen had arts-patiënt communicatie een laag verbeterpotentieel. Een gehele sterkere eerstelijnsstructuur is gecorreleerd aan een lager verbeterpotentieel van continuïteit en omvattendheid van zorg. In landen met een sterkere eerstelijnssturing ervaren patiënten minder verbeterpotentieel rondom continuïteit van zorg. Landen met betere economische condities voor de eerstelijns hadden minder verbeterpotentieel voor alle kenmerken van persoonsgerichte zorg.

In hoofdstuk 6 bestudeerden we hoe brede taakprofielen van huisartsen bij kunnen dragen aan de kwaliteit zoals ervaren door patiënten en, dus, de mogelijke voordelen van de eerstelijns. We gebruikten de huisartsen en patiëntengegevens verzameld in de QUALICOPC studie.

Gegevens over patiënten werd gekoppeld aan de gegevens over de huisartsen. Multilevel modellering werd gebruikt om schaalscores over

patiëntervaringen te berekenen op vijf gebieden van kwaliteit en over de breedte van de taakprofielen van huisartsen. In deze modellen met vier niveaus zitten items binnen patiënten binnen huisartsenpraktijken binnen landen. De relatie tussen de breedte van de taakprofielen en de ervaringen van patiënten werd geanalyseerd in multilevel modellen met drie niveaus, waarin ook werd meegenomen wat patiënten belangrijk vinden. In landen waar huisartsen bredere taakprofielen hebben, ervaren patiënten een betere toegankelijkheid, continuïteit, veelomvattendheid van zorg en meer betrokkenheid in het maken van beslissingen. Er werden geen associaties gevonden tussen de breedte van taakprofielen van huisartsen en de ervaren arts-patiënt communicatie. De breedte van de taakprofielen kon vooral de variatie tussen landen verklaren op de gebieden van ervaren toegankelijkheid en continuïteit van zorg. De studie liet zien dat in landen waar huisartsenpraktijken functioneren als een 'one-stop-shop', patiënten een betere kwaliteit van zorg ervaren, vooral op het gebied van toegankelijkheid en continuïteit van zorg.

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Curriculum Vitae

Willemijn Schäfer was born on the 29th of August 1984 in Rotterdam, the Netherlands. She obtained a Bachelor of Science degree in Health Sciences and a Master's degree in Health Economics, Policy and Law at the Erasmus University in Rotterdam. She is a researcher with a specific focus on international comparative health services research and primary care. She has worked on the Health Systems in Transition profile of the Netherlands of 2010 which was published by the European Observatory on Health Systems and Policies. Between 2010 and 2014 she has coordinated the EU funded study QUALICOPC (Quality and Costs of Primary Care in Europe). Based on this study, in which data were collected among GPs and patients in 34 countries, she prepared this PhD thesis. She has also worked on various other studies focusing on e.g. the workload of Dutch GPs and the knowledge, skills and competences of health care assistants in Europe. She has provided guest lectures at various university departments and institutes.

List of publications of the author

Pullicino G, Sciortino P, Camilleri L, Schäfer W, Boerma W. The Influence of Patient Characteristics on Healthcare-Seeking Behavior: A Multilevel Analysis of 70 Primary Care Practices in Urban-Suburban Regions in Malta. *Quality in Primary Care*. 2016; 24(3):106-110.

Schäfer WLA, van den Berg MJ, Boerma WGW, Schellevis FG, Groenewegen PP. Taakprofielen van huisartsen in Nederland en Europa. [Service profiles of GPs in the Netherlands and Europe]. *Huisarts&Wetenschap*, 2016; 59(7):286-291.

Schäfer WLA, van den Berg MJ, Groenewegen PP. De werkbelasting van huisartsen: Nederland in internationaal perspectief. [The workload of GPs: the Netherlands in an international perspective]. (Policy summary) 2016. Utrecht: NIVEL.

Schäfer WLA, van den Berg MJ, Groenewegen PP. De werkbelasting van Nederlandse huisartsen in internationaal perspectief: Een overzicht op basis van een studie onder huisartsen in 34 landen [The workload of Dutch GPs from an international perspective: An overview based on a study among GPs in 34 countries]. *Huisarts&Wetenschap*, 2016; 59(3):94-101.

Sirdifield C, Godoy Caballero AL, Windle K, Jackson C, Schäfer WLA, Siriwardena N. Comparing importance and performance from a patient perspective in English general practice: a cross-sectional survey. *Family Practice*, 2016; 23(2):179-185

Groenewegen PP, Greß S, Schäfer WLA. General practitioners' participation in a large, combined general practitioner – patient survey: recruitment procedures and participation. *International Journal of Family Medicine*, 2016, Article ID 4929432, 9 pages.

Schäfer WLA, Boerma WGW, Spreeuwenberg P, Schellevis FG, Groenewegen PP. Two decades of change in European general practice service profiles: conditions associated with the developments in 28 countries between 1993 and 2012. *Scand J Prim Health Care*. 2016 Feb 10:1-14

Groenewegen PP, Greß S, Heinemann S, Schäfer WLA. Primary care practice composition in 34 countries. *Health Policy*. 2016

Hoffmann K, George A, Dorner T, Süß K, Schäfer W, Maier M. Primary health care teams put to the test a cross-sectional study from Austria within the QUALICOPC project. *BMC Family Practice* 2015, 16:168

Hoffman K, Wojczewski S, George A, Schäfer W, Maier M. Stressed and overworked? A cross-sectional study of the working situation of GPs in Austria in the framework of the QUALICOPC project *Croat Med J*. 2015;56:366-74.

Schäfer WLA, Boerma WGW, Murante AM, Sixma HJM, Schellevis FG, Groenewegen PP. Assessing the potential for improvement of primary care in 34 countries: a cross-sectional survey. *WHO Bulletin* 2015, article ID: BLT.14.140368.

Pullicino G, Sciortino P, Calleja N, Schäfer W, Boerma W, Groenewegen P. Comparison of patients' experiences in public and private primary care clinics in Malta. *European Journal of Public Health*. November 12, 2014: 1-3.

Hansen J, de Jong J, Schäfer W, Groenewegen P. Strengthening the European Dimension of Health Services Research (Policy brief). Utrecht: HSR Europe. 2013.

Schäfer WLA, Boerma WGW, Kringos DS, De Ryck E, Greß S, Heinemann S, et al. Measures of quality, costs and equity in primary health care: Instruments developed to analyse and compare primary health care in 35 countries. *Qual Prim Care*. 2013 May;21(2):67-79.

Schäfer WLA, Boerma WGW, Kringos DS, De Maeseneer J, Greß S, Heinemann S, Rotar- Pavlic D, Seghieri C, Svab I, Van den Berg MJ, Vainieri M, Westert G, Willems S, Groenewegen PP. Study protocol: QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care, BMC Family Practice. 2011, 12: 115. (Highly Accessed Publication).

Schäfer W, Groenewegen PP, Hansen J, Black N. Priorities for health services research in primary care. Quality in Primary Care, vol. 19, 2011, no. 2, p. 77-83.

Hansen J, Black N, Busse R, Børlum Kristensen F, Ettelt S, Fischer C, Groenewegen P, Klazinga N, Mays N, Palmhøj Nielsen C, Schäfer W, Velasco Garrido M. Health services research: tackle Europe's health care challenges (Policy brief), Utrecht: HSR Europe. 2013.

Greß S, Heinemann S, Schäfer W. Reform auf Realitätskurs. Vol.16, 2013, no. 4/13, p. 32-37 (Publication in German).

Willems S, De Ryck E, Schäfer W. Onderzoek naar de kwaliteit, kostprijs en billijkheid van de eerstelijnsgezondheidszorg in Europa. Huisarts Nu 2012;41:123-4 (Article in Dutch and has been translated and published in Czech, Hungarian, Italian and Turkish).

Hansen J, Schäfer W, Black N, Groenewegen P. European priorities for research on health care organizations and service delivery. J Health Serv Res Policy. 2011 Jul;16 Suppl 2:16-26,

Schäfer W, Hansen J, Groenewegen P. Chapter 2: Use of information tools for measuring the production of HSR, its use in health care policy and future priorities, p.19-26. In: Health Services Research into European Policy and Practice, edited by Hansen, J. Utrecht: NIVEL; 2011.

Hansen J, Schäfer W, Black N, Groenewegen P. Chapter 4: Health care organisations and service delivery, p.65-98 In: Health Services Research into European Policy and Practice, edited by Hansen, J. Utrecht: NIVEL; 2011.

Groenewegen PP, Busse R, Ettelt S, Hansen J, Klazinga N, Mays N, Schäfer W. Health services research in Europe: what about an open marriage? Eur J Public Health (2011) 21 (2): 139-141.

van Ginneken E, Schäfer W, Kroneman M. Managed competition in the Netherlands: an example for others? Eurohealth, vol. 16, 2011, no. 4, p. 23-26.

Schäfer W, Kroneman M, Boerma W, van den Berg M, Westert G, Devillé W and van Ginneken E. The Netherlands: Health system review. Health Systems in Transition, 12(1):1-229.

Kruikemeier S, Schäfer WLA, Coppen R, Friele RD. Evaluatie Gefaseerd Toezicht [Evaluation Phased Supervision]. Utrecht: NIVEL, 2010. (Report, Dutch).