What drives
Community Oriented Primary Care?

A multilevel analysis of country-, practice- and GP characteristics on GPs community orientation

by Lisa Vermeulen

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Preface

Dear reader,

I am very pleased to present to you my master thesis: 'What drives Community Oriented Primary Care? A multilevel analysis of country-, practice- and GPs characteristics on GP community orientation'.

I have worked very, very hard on it during my internship at the Nivel Institute (Netherlands Institute for health services research) and I am pleased with the resulting paper. However, I could not have written a paper I am so very proud of without the help of others.

First of all, I would like to thank two of my close colleagues at the Nivel Institute: my internship- as well as thesis supervisor Peter Groenewegen, for sharing his many years of knowledge and experience, always giving insightful advice and getting me excited about research. Furthermore, I would like to thank Thijs van der Knaap for being a sounding board, providing moral support, making maps and being a very helpful and fun co-stagiar in general.

Furthermore, I would like to thank Willemijn Schäfer for sharing advice, operationalizations and most of all: her experience with the QUALICOPC dataset and the dataset itself.

In addition, my thanks go out to Lucas van der Hoek and Peter Spreeuwenberg, for helping me with all kinds of statistical details, such as merging datasets and crashing MlwiN software.

And lastly, all of my Nivel colleagues, for always being interested in my research and being willing to help out wherever they could.

Please all enjoy reading my thesis!

Sincerely,

Lisa Vermeulen

Summary

Introduction
Community Oriented Primary Care (COPC) is a method that aims to enhance community health by 1) defining and characterizing communities and subcommunities within the community; 2) identifying (sub-)community health problems; 3) developing and implementing intervention(s) to improve found health problems; 4) monitoring and evaluating implemented intervention(s); 5) involving the community in community oriented projects. COPC is practiced predominantly by general practitioners (GPs).

Research questions
This paper examines GPs community oriented vision - 'community orientation' -, by 1) analyzing how GPs community orientation is distributed over 34 (mostly European) countries; 2) analyzing how country-, practice- and GP level characteristics relate to GPs community orientation and 3) producing evidence-based policy advice regarding the international promotion of GPs community orientation.

Methods
QUALICOPC survey data on ~7500 GPs in 34 (mostly European) countries is analysed, using hierarchical multilevel analysis. The dependent variable, GP community orientation, is measured using a scale of three questions on whether or not GPs answered they would report to an authority if they were confronted with the following situations: repeated accidents in an industrial setting, frequent respiratory problems in patients living near a certain industry and repeated cases of food poisoning. Independent variables are at the system-, practice- and individual GP level.

Results
Findings are that at the country level, having a patient list system is positively related to GPs community orientation and transitional health care systems are negatively related to GPs community orientation. At the practice level, practicing preventive care, interdisciplinary collaboration and practicing in rural areas are positively related to GPs community orientation and GPs perception of a below average ethnic minority proportion of patient population is negatively related to GPs community orientation. At the GP level, having other paid activities next to working as a GP is positively related to GP community orientation.

Conclusion and policy advice
Reasons for the significant relationships of practising in rural areas, GPs perception of proportion of ethnic minority patients and having other paid activities with GPs community orientation are unclear. Therefore, policy advice is formulated regarding the implementation of nationally enforced patient list systems, preventive care and interdisciplinary collaboration.

Table of contents

Figures and tables list

1   Introduction

In the late 1930's the chaotic state of South Africa's public health system had left especially black and remote rural communities to deal with severe illness, disability and premature death (Jeeves, 2000). Parliamentary concern about the spread of preventable infectious diseases grew and the South African Department of Public Health reacting by setting up a network of innovative public health professionals that took over health care administration (Ibid.).

The new policy leaders maintained the view that community health is inseparable from welfare and that social well being cannot be detached from physical health (Ibid.). With the establishment of this new paradigm, an opportunity window was opened for experiments with social medicine.

Two young physicians, Sidney and Emily Kark, seized this opportunity and set up a community oriented health care centre in one of the poorest and most disease-ridden areas in South Africa: Pholela (Jeeves, 2000; Tollman, 2004). They began with establishing a baseline diagnostic of community health, in order to plan for future community health interventions (Mullan & Epstein, 2002), while simultaneously trying to involve the community in their work: they met with community leaders, trained locals as 'health assistants' and mobilized school teachers as 'apprentice health educators' (Jeeves, 2000; Mullan & Epstein, 2002; Tollman, 1994).

The Kark's 1930's project brought together elements from primary care, community medicine, preventive medicine, epidemiology and health promotion (Longlett et al., 2001). Their approach was an enormous success which had a "striking positive impact" in community health for the Pholela population (Longlett, Kruse & Wesley, 2001: p. 61). They named it *community oriented primary health care (COPC)* (Longlett, Kruse & Wesley, 2001).

Since then, COPC has gained popularity and is being used in projects in various countries all over the world (see, for instance: Gillam & Schamroth, 2002; Huish, 2008; Frigola-Capell, 2014). Furthermore, the World Health Organisation and European Commission advocate for community based healthcare and recommendations have been made by the scientific community to put incentives in place to stimulate general practitioners (GPs) to practice community oriented care.

GPs are the most qualified primary care professionals to execute COPC because GPs have the broadest reach into local communities, which leads them to understand local needs (Bakker & Spreeuwenberg, 2006). Additionally, GPs are gatekeepers in some European health systems (Westert et al., 2006; Kringos et al., 2015; Schäfer, van den Berg, & Groenewegen, 2016), which makes them key actors when it comes to the flow of patients into the health care system.

In order to be able to stimulate GPs to practice COPC, it is necessary to know what GPs vision regarding COPC is. This vision will be named 'community orientation'. Furthermore, it is important to know which characteristics are related to GPs community orientation. The present paper provides an answer to those questions.

1.1 Research questions and objectives

Firstly, this paper answers a descriptive question on the distribution of GPs community orientation in 34 (mostly European) countries.

How is GPs community orientation distributed over 34 countries?

Secondly, an explanatory question is answered regarding country-, GP practice- and GP level characteristics that are related to GP community orientation.

How are country- and GP (practice)-level characteristics related to GPs community orientation?

Based on the results of the first two questions, a third policy question is answered.

What evidence-based policy advice can be given to increase GPs community orientation, and how should these policies be implemented?

1.2 Empirical strategy

In order to answer the first two research questions, data from the international study 'Quality and Costs of Primary Care in Europe' (QUALICOPC) is analysed. The 34 countries studied include 26 European Union member states as well as Australia, Canada, Iceland, FYR Macedonia, New Zealand, Norway, Switzerland and Turkey (Schäfer, 2016).

The dependent variable, community orientation, is measured using a scale of three questions on whether or not GPs answered they would report to an authority if they were confronted with the following situations: repeated accidents in an industrial setting, frequent respiratory problems in patients living near a certain industry and repeated cases of food poisoning.

Independent variables are at the system level (national organizational structure and healthcare system characteristics), practice level (resources, methods, organizational structure and task environment) and the individual GP level (individual characteristics)(figure 1).

Figure 1: Schematic representation of empirical strategy
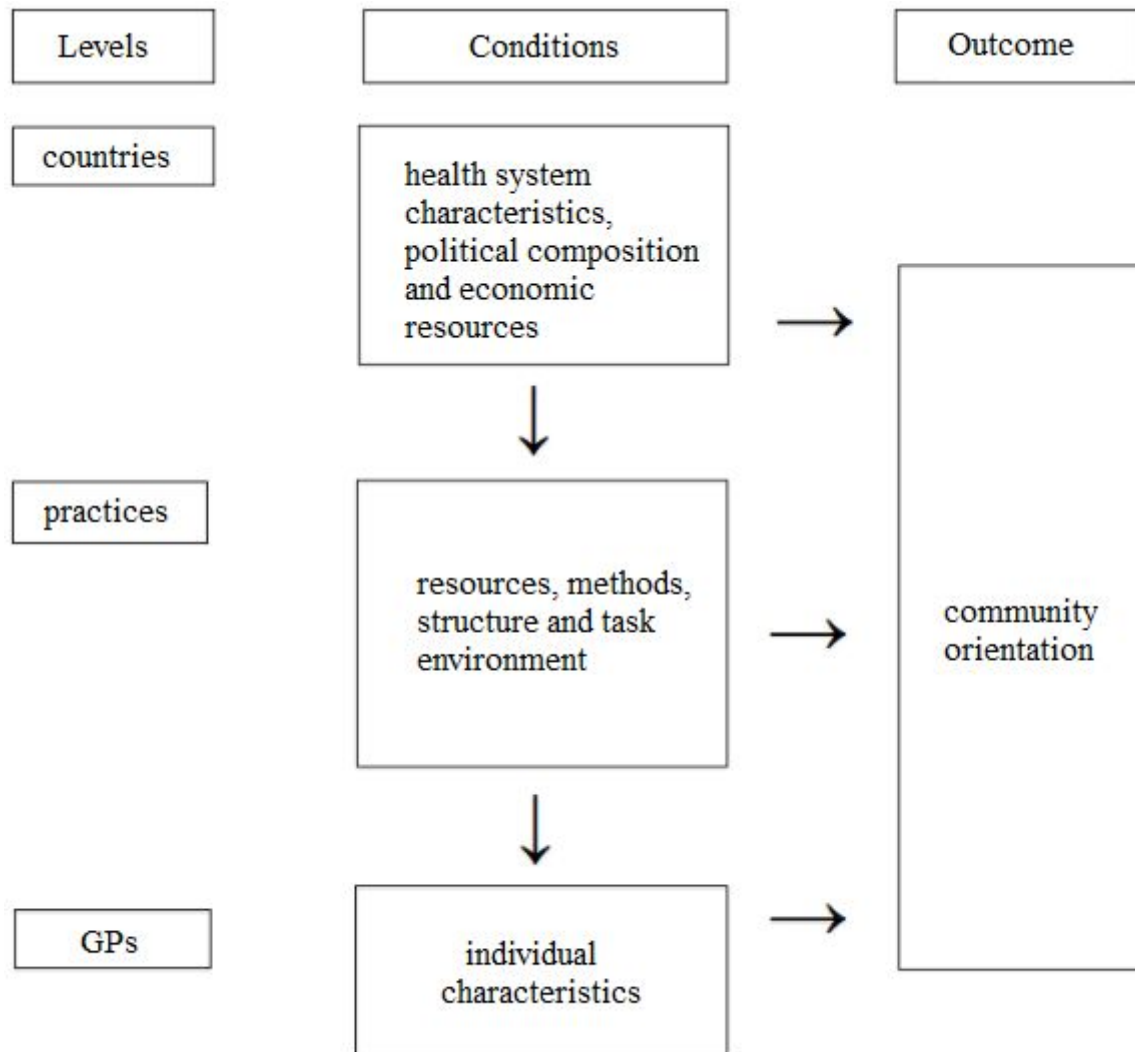
Based on outcomes from the first two research questions, policy advice regarding the stimulation of GPs community orientation is formulated as an answer to the third research question.

1.3   Societal relevance

Community oriented primary care is part of a world-wide paradigm shift from approaches to disease on an individual level to approaches that involve the community context and focus on population health (Merzel & D'Afflitti, 2003; Williams, 2004).

  The World Health Organisation has led the worldwide debate about the expansion of the central role for communities in health care development since 1978, starting with the declaration of Alma Ata (WHO, 1978).The WHO, European Commission and the European Forum for Primary Care stress the importance of community oriented, people-centred care (EFPC, 2017a; EXPH, 2014; WHO, 2017d) and the European Forum for Primary Care has

established the "Alliance for Community Oriented Primary Care" services (ACOPCs), with the aim of strengthening advocacy for COPC and stimulating the emergence of COPC associations in Europe (EFPC, 2017a).

The community oriented approach is deemed increasingly important because demand for healthcare has increased due to multi-morbidity (Starfield, 2011) and aging populations (Meerding et al., 1998), which puts strain on healthcare professionals and national financial resources (Starfield et al., 2009; Meerding et al., 1998). A more integrated, efficient provision of services in health facilities as well as in the community is needed (Kringos et al., 2015; Frenk, 2009; WHO, 2008).

The community oriented primary care approach is believed to provide an efficient integration of services, as it takes the social and environmental context of communities into account. In doing so, it creates a bridge between clinical care and public health (Williams, 2004), which allows local health threats to be detected at an early stage. This may unburden the rest of the health care system.

In previous research on community oriented primary care, recommendations have been made to include (financial) incentives for community orientation (Boerma et al., 2015). However, in order to follow up on this recommendations and design a successful COPC implementation strategy, an overview of the current situation regarding community oriented care is needed. This research paper aims to do just that, as its eventual goal is to formulate advice for policy makers who wish to implement COPC in the European context, on the basis of evidence regarding factors that are related to community orientation outcomes.

1.4   Scientific relevance

Slovenian researchers Pavlič et al (2015) have recently created a descriptive account of GPs community orientation in 34 countries. The present paper builds on this 2015 research, using the same QUALICOPC data, and adds to it an analysis on factors that are related to GPs community orientation.

It follows from this approach that this paper does not attempt to solve a theoretical problem or test competing scientific theories. Instead, it classifies as applied, sociological research concerning health care systems. This is applied research, because it aims to add to the worldwide scientific debate on strategies to make primary healthcare stronger.

At the same time, community oriented primary care is a sociological subject, as it relates to all three of the main sociological questions. First of all, community involvement (which is necessary in order to practice community oriented care) requires some threshold of social cohesion in order to be able to happen, while simultaneously enhancing social cohesion within communities as it happens. Secondly, community oriented primary care is seen as a strategy to reduce inequalities in health and access to health services (Williams, 2004) and lastly, community oriented primary care relates to rationalization, as it is a primary care strategy that is aimed at prevention and efficiency through tailor-made healthcare approaches for different subcommunities within patient populations.

The main contributions of this paper to the scientific field of community oriented health care are

➢ a comprehensive, descriptive sketch of GPs community orientation in 34 countries
➢ insight into characteristics of national (health care) systems, GP practices and individual GP characteristics that contribute to GPs community orientation

1.5   Chapter overview

After the introductory chapter, a definition of community oriented primary care is given in chapter 2. After that, a general framework theory is introduced and hypotheses and expectations are formulated. In chapter 3, a descriptive account of the data is given along with the structure of variables and operationalizations of concepts. In the methods section, an overview of the analyses and modelling strategy is provided. Chapter 4 summarizes results from the analysis, whereupon a general conclusion on country- as well as practice level is drawn in chapter 5. In chapter 6, policy advice regarding implementation of GP incentives is formulated, with the aim of enhancing community orientation and care. Lastly, the contributions and limitations of this paper are discussed in chapter 7.

2   Theory and hypotheses

2.1   COPC definition

The definition of COPC - as coined by its founders, Sidney and Emily Kark - includes five elements: the use of epidemiology and clinical skills, assuming responsibility for a defined population, clear-defined programs to address communities' health problems, community involvement (involvement from GPs in the community as well as involvement from the community in COPC programs), and accessibility to a community oriented program's services (Kark & Kark, 1983).

Next to this definition, a practical four- or five-step process of COPC exists. It includes the following steps: 1) defining and characterizing community and subcommunities within the community, 2) identifying (sub-)community health problems, 3) developing and implementing intervention(s) to improve found health problems and 4) monitoring and evaluating implemented intervention(s). Documented processes differ from each other in leaving 'community involvement' implicit or including it as a distinct fifth step (Connors et al., 2003; Gavagan, 2008; Nutting, 1985; Strelnick, 1999). In figure 2, an representation of a five-step process is shown. The diagram illustrates that the COPC process is a "dynamic process that centers on engaging and mobilizing the community, but that may not necessarily follow linear, sequential steps" (Strelnick, 1999: p. 550).

Figure 2: The five-step process of COPC, adopted from Strelnick, 1999. Originally from Rhyne, Cushman & Kantrowitz, 1998.
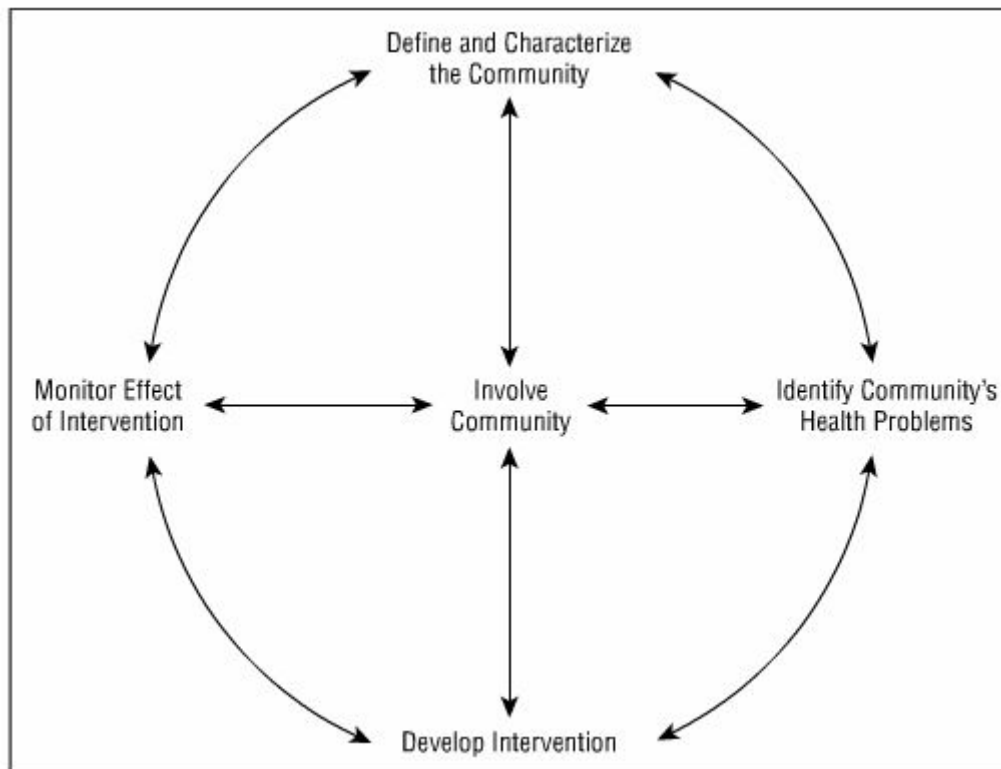
The present paper adopts the five-step plan, described above, as its leading definition of COPC, while emphasizing that the research this paper presents is not about whether or not GPs implement the COPC method, but whether or not GPs adhere to its ideas.

2.2 General framework theory

In this section, readers are provided with a general framework theory, which will aid in understanding the foundation in which this paper's hypotheses are grounded. The general framework theory is based on Boudon's cognitivist theory of action (CTA), while taking into account elements of Simon's concept of bounded rationality. It is structured according to the approach of sociological modelling, as explained by Groenewegen (1996).

In the following section, the cognitivist theory of action is described. After that, country-, practice- and GP-level hypotheses are formulated in the sections 2.3 - 2.5. Assumptions from the cognitivist theory of action are used (explicit and implicit) in the formulation of theories that support the hypotheses.

2.2.1 The cognitivist theory of action

The cognitivist theory of action (CTA) presumes that individual actions are rational choices: even if an actor has insufficient information, (s)he makes a choice of action based on that

information, which makes the action rational within the context of that moment (Boudon, 1996). If an outsider perceives this action, and knows which information the actor has, this action is understandable, however it may appear to be not rational (Ibid.).

Operating on the basis of incomplete information is a form of *bounded rationality*. This term was first coined by Simon (1957), and represents the idea that individuals are intendedly rational, but sometimes fail to be because of human cognitive and emotional brain structures (Jones, 1999).

The "inner environment of people's thoughts" (Simon, 2000: p. 25) is however not the only factor that confines individuals' behaviour. Additionally, constraints and opportunities are created by the systems in which they work and live (Simon, 2000). In this paper, this translates to a situation in which GPs' individual behaviour is influenced by the (healthcare) systems within which they operate. This includes national confinements as well as more direct restrictions such as practice regulations.

In the following sections, country-, practice- and individual conditions that are related to GP (community oriented) outcomes are described and hypotheses and expectations are deducted.

2.3   Country conditions and community orientation

Country conditions for GPs' community orientation are created through healthcare system characteristics, countries' political composition and countries' economic resources.

Healthcare system characteristics consist of the strength of countries' primary care system, the structure of healthcare systems (national health systems, social health insurance systems or transitional systems) and the enforcement of the use of patient list systems. Countries' political composition refers to the political climate (left-, centre- or right wing) and countries' economic resources refer to country gross domestic product (GDP).

2.3.2   Country hypotheses

COPC is a component of primary care systems (Macinko, Starfield & Shi, 2003; Starfield, 1998; Starfield & Shi, 2002; WHO & Unicef, 1978). If countries invest time and resources into their primary care systems, their primary care systems likely become stronger. This is expected to indirectly benefit community oriented care, being a component to primary care structure.

If community oriented care is (indirectly) promoted through investments in primary care, it is expected that GPs are more likely to be encouraged to practice COPC than if community oriented care is not (indirectly) promoted through investments in primary care. Therefore, it is hypothesized that a stronger primary care structure leads to higher GP community orientation.

H1: GPs community orientation is stronger in countries with stronger primary care structures, than in countries with weaker primary care

Next, healthcare systems are discussed. There are three main basic healthcare systems in Europe: national healthcare systems (NHS), social health insurance systems (SHI) and transitional systems.

In NHS systems health care is provided and financed by the government through obligatory tax payments. Local authorities receive state budgets with which they finance hospital care and contract independent practitioners. Healthcare providers are predominantly state-owned and financed, however private services and insurance exist as well (Marrée & Groenewegen, 1997).

SHI systems use an income related insurance system to which all citizens contribute. Insurance premiums are combined in sickness funds, which contract health providers. Care institutions are predominantly in the private sector (Marrée & Groenewegen, 1997).

Transitional healthcare systems are mixtures of health systems, that can be found in former communist countries. They inherited the centralized Soviet system, which is state-owned, -managed and -financed, and aims for free, universal coverage (Marrée & Groenewegen, 1997). After the break-up of the Soviet Union, they called for change due to poor quality, inefficiency and lack of responsiveness (Rechel, Richardson & McKee, 2014: chapter 1). Now, most formerly Soviet countries are in the process of transforming their healthcare system into an insurance system (Rechel & McKee, 2009).

Tenbensel, Eagle & Ashton (2012) found that it is relatively easier to implement government initiated health care reforms in NHS systems than it is in SHI systems. Governments in NHS systems have a stronger role than in countries with a SHI or transitional health care system.

For this reasons, it is expected that NHS systems are more likely than SHI or transitional systems to implement new primary care policy, such as community oriented policy. This implies that GPs in NHS systems are more likely to be community oriented than GPs in SHI or transitional systems. The following hypotheses regarding healthcare systems is formed.

H2: GPs community orientation is higher in NHS systems than GPs community orientation in SHI or transitional healthcare systems

In this next section patient list systems are discussed. Patient list systems are (usually) nationally enforced systems in which patients need to be registered at a particular GP practice in order to receive care from GPs in that practice. Patient list system are obligatory in 23 of the 34 countries that are analysed in this paper (see appendix B, table 13).

In these countries, GPs, per definition, have a clearly defined practice population. Having a demarcated patient community is a prerequisite for community oriented primary care as defined by the Kark's (Kark & Kark, 1983; De Maeseneer & Derese, 1998) as it allows GPs to draw up and gain insight into community health statistics and context factors

that are related to health, such as socioeconomic status, for a specific and well-demarcated community.

It must be noted, however, that GP's' patient list systems do not always coincide with natural patient communities per se. It is, for instance, possible that patients are registred with a GP practice in another city. Nonetheless, it is argued that most patients registered at the same GP practice belong to the same patient community and therefore it is expected that having a patient list system which gives a rough account of the patient community is better than having none at all.

In short, patient list systems are national policy in many countries and set a condition that allows GPs to be able to practice COPC. Therefore, it is expected that in countries where patient list systems are obligatory, GPs community orientation is higher than in countries where patient list systems are not obligatory.

H3: GPs community orientation is higher in countries where patient list systems are obligatory than in countries where patient list systems are not obligatory

This section will discuss the relationship of countries' political climate with GPs community orientation. Several studies have shown that the political composition of a country's government is related to policy priorities for the health care system (Groenewegen, 1994; Imbeau, Pétry & Lamari, 2001; Tenbensel, Eagle & Ashton, 2012). Left-wing parties are often more motivated to advocate equal access to health care, in order to optimise population health in comparison to centre- and right-wing parties (Tenbensel, Eagle & Ashton, 2012).

COPC is a strategy that is used to create access to healthcare for all societal groups, and may thus be seen as an equalizing strategy (Williams, 2004) that will likely be endorsed more by left-wing political parties than by centre- or right-wing political parties.

As a result of this, it is expected that countries with a longer history of left-wing parties in government formulate more community oriented policies than countries with longer histories of centre- or right-wing parties in government. It is expected that more community oriented policy stimulates GPs community orientation.

In summary, it is argued that community orientated policy is more likely supported by left-wing political parties, rather than by right-wing or centre-oriented national political parties, and that this stimulates GPs community orientation.

H4: GPs community orientation is higher in countries with a longer history of left-wing parties in government than in countries with a longer history of centre- or right wing parties in government

Lastly, economic resources are discussed. Countries' economic resources determine the amount of money available for health care, as well as options for policymakers to organise the healthcare system (Van der Zee, Boerma & Kroneman, 2004).

Wealthier countries in Europe usually have weaker primary care structures than less wealthy countries (Kringos, 2012: chapter 7). This is most likely due to the fact that countries

with higher income can afford to rely on (expensive) hospital care (Pelone et al., 2012), rather than cheaper primary care.

Consequently, it is expected that less wealthy countries spend more money on primary care than wealthy countries. Since COPC is a component of primary care, the expectation follows that high GP community orientation is more frequently found in less wealthy countries, rather than wealthy countries.

H5: GPs community orientation is higher in countries with lower gross domestic product than in countries with higher gross domestic product

In the next section, practice conditions and hypotheses are discussed.

2.4 Practice conditions and community orientation

Lamarche et al. (2003) describe primary care organisations using four dimensions: vision, resources, organizational structure and practices. Vision refers to "the beliefs, values and objectives by which players communicate and justify their actions", resources are defined as "the quantity and variety of resources available", organizational structure consists of "the legislation, regulations, agreements, and other arrangements that govern and guide the behaviour of players, their relations with each other, and the authorities than define them" and practices are "the processes behind production of activities and services" (Lamarche et al., 2003: p. 4).

Lamarche et al.'s use of the word *practices*, however, is very inconvenient within the context of this paper, since it is identical to GP *practices* as a term to denote the whole organization. In order to prevent confusion, *practices* is substituted for *methods*.

Furthermore, it is argued that community orientation accounts for the *vision* that is inherent to the culture of GP practices. Health professionals are required to be willing to invest valuable time and resources and have to actively set the objective to work community oriented, as in most countries working in a community oriented way is not the standard (Kringos et al., 2015).

Lamarche et al.'s other three components *organizational structure, methods* and *resources* are regarded as tools that can be used by health professionals to support a community oriented practice vision, and are included in this paper's categorization of practice hypotheses.

The following adaptation of Lamarche et al. (2003) is used to define practices within this research:

➢ resources: economic or social aids that can be drawn upon when needed
➢ organizational structure: the legislation, regulations, agreements, and other arrangements that govern the behaviour and professional status of healthcare professionals
➢ methods: the processes behind production of activities and services

2.4.1 Practice hypotheses

Practice organizational structure includes hypotheses regarding payment systems and organizational structure, practice methods includes hypotheses regarding medical record keeping and preventive practice, practice resources[1] includes a hypothesis about interdisciplinary collaboration and practice task environment includes hypotheses regarding urbanity and proportion of socially disadvantaged and ethnic minority patients.

Practice organizational structure

Research by Boerma, van der Zee, Fleming et al. (1997) shows that self-employment (as opposed to salaried employment) of GPs is associated with greater involvement in activities such as disease management and screening blood cholesterol in 32 European countries. They draw the conclusion that feelings of independence may encourage self-employed GPs to develop services in addition to those basic to general practice. This conclusion is supported by a more recent research by Boerma (2003), which uses the same data and confirms that self-employed GPs are more active in providing services than salaried GPs.

These findings may be explained by the fact that being self-employed implies ownership. Crampton (2005) has found that ownership confers accountability and responsibility to healthcare organisations. This means that self-employed GPs may feel more responsible for their practice than their salaried counterparts, because they are ultimately responsible for the outcomes that the practice delivers and thus (partly) for community health.

In summary, research has indicated that self-employment is associated with greater GP involvement in non-basic general practice and greater feelings of responsibility for outcomes of the practice. Community oriented practice is an example of a service presently not basic to general practice. On top of that, it requires a sense of responsibility for the health of a practice population. For these reasons, it is argued that self-employed GPs are more community oriented than salaried GPs.

H6: GPs community orientation is higher for self-employed GPs than for salaried GPs

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[1] 'Interdisciplinary collaboration' is placed under resources rather than methods, because the ability to collaborate with other professionals is dependent on GPs' professional network.

GP payment systems exist in five different forms: capitation, fee-for-service, out-of-pocket, performance payment and salary. Often there is a mix of systems. However, a division can be distinguished based on type of employment: self-employed GPs usually receive payment through capitation- and fee-for-service payment and salaried GPs most often receive only salaried payment.

Assuming that people in general are motivated by increased payment, capitation payment encourages GPs to increase their patient list size and keep their patients satisfied, to not lose subscription fees. Fee-for-service payment creates an incentive to provide as much services as possible, out-of-pocket payment stimulates GPs to rationalize patients' use of health services, salaried employment incentivises GPs to want to work more paid hours, or do less work in the hours they are paid for (Kroneman, Van der Zee & Groot, 2009) and pay-for-performance stimulates quality of care (Rosenthal & Dudley, 2007; WHO, 2017c), depending on what kind of outcome the performance payment stimulates.

However, GPs cannot increase the volume of services or their patient list and working hours perpetually. For instance, working more than the amount of contracted hours in salaried service is often not compensated for and fixed maximum numbers for patient lists and budget caps on fee-for-services arrangements exist (Kroneman, Van der Zee & Groot, 2009).

Nevertheless, within a fee-for-service system it is expected that GPs are more reluctant than in other payment systems to engage in COPC, as it takes extra (uncompensated for) time and thus does not generate income.

GPs within capitation and salary systems are expected to be more positive towards COPC than GPs within fee-for-service systems, because GPs in capitation and salary systems receive a fixed amount of money respectively per patient or per hour worked. GPs in capitation payment and salary payment systems can thus allow themselves to spend time on COPC without risking direct decrease of payment.

Additionally, GPs in capitation systems are incentivised to keep their patients satisfied, so they stay with the practice and GPs can receive subscription fees for these patients. It is expected that COPC is a strategy to keep patients satisfied.

Lastly, maintaining the assumption that people in general are motivated by increased pay, pay-for-performance systems are expected to increase community oriented efforts when (large enough) bonuses are awarded for community oriented behaviour. This cannot be tested, however, since no performance payments for community oriented behaviour could be identified. Therefore, a hypothesis regarding the other three payment systems is formulated.

It is expected that GPs in fee-for-service systems are less inclined to implement COPC than GPs in salaried or capitation payment systems. Additionally, it is expected that GPs in capitation payment systems, since they have an incentive to keep patients happy, are more likely to be involved in COPC than GPs in salaried payment systems.

H7: GPs community orientation is lowest within systems in which fee-for-service payment is dominant, higher within systems in which salaried payment is dominant and highest within systems in which capitation payment is the dominant form of GP payment

Practice methods

In this section, electronic medical record keeping and preventive practice is discussed. Electronic medical record keeping enables GPs to keep track of large databases with patient demographics (such as name, date of birth, gender) and details about patient-GP contact. Keeping track of patient and contact-characteristics is an important prerequisite for community oriented practice, because it allows GPs to a) work with a clearly defined population b) generate health records on the basis of demographic or medical characteristics.

Generating health records on the basis of demographic or medical characteristics is an important tool for community oriented GPs, because it allows them to search for and discover sub-communities with specific health needs and (sub-)community health trends. Preventive or health promotion projects can then be started based on these trends in order to promote community health.

Medical record keeping thus creates necessary conditions for community oriented practice. For this reason, it is hypothesized that medical record keeping contributes to community oriented practice amongst GPs. However, creating the necessary conditions does not necessarily mean that GPs make use of these conditions. Therefore, it is expected that GPs who actually do make use of electronic medical records to generate health records are more community oriented than GPs who do not.

H8: GPs community orientation is higher if they use electronic medical records to generate health records than they do not use medical records (to generate health records)

Preventive general practice has proven to be a cost-effective strategy (Town, Kane, Johnson & Butler, 2005) to promote "healthy, active and independent lives in old age" (Jusot, Or & Sirven, 2012: p. 24) and is therefore widely endorsed by amongst others the World Health Organisation and the European Commission (European Commission, 2013; EXPH, 2014; WHO, 1978; 2008; 2017d).

However, providing risk groups with health information and reaching out to people who are not ill has no strong tradition in European general practice (Boerma, 2003). European GPs give priority to diagnosis and the provision of treatment over spending time on prevention projects (Jusot, Or & Sirven, 2012).

Preventive care requires outreaching behaviour, like community oriented practice. Many authors deem preventive care an integral part of community oriented practice (see, for instance: Longlett, Kruse & Wesley, 2001; Brill, Ohly & Stearns, 2002; Gofin & Foz, 2008; Muldoon et al., 2010). However, the two are not interchangeable: preventive practice is deemed to be a pivotal part of community practice, but community practice is not necessarily a condition for preventive projects. Therefore, it is argued that preventive practice is a prerequisite for community oriented practice.

H9: GPs community orientation is higher when they practice preventive care than when they do not practice preventive care

Resources

An interdisciplinary approach to healthcare is expected to have a positive relationship with community oriented practice, for two reasons. Firstly, GPs who are frequently in contact with other (health) professionals gain information about community health and socio-economic circumstances that influence community health. Contact with local social workers, for example, may yield information about substance abuse of domestic violence in the community and inspire ideas for prevention- or community health projects.

   Secondly, contact with other professionals creates feedback loops from which both parties can learn and improve their practice. Think, for instance, of sharing knowledge on how to best treat traumatized refugee- or homeless subcommunities.

H10: GPs community orientation is higher when they make use of interdisciplinary resources than if they do not make use of interdisciplinary resources

Task environment

Rural communities differ strongly from urban communities in the sense that citizens of rural communities have stronger social capital (Putnam, 1995; Sampson, 1988) and are slightly more socially integrated and attached to the community than individuals in urban communities (Putnam, 1995). Urbanization, on the other hand, has been linked to decreased local friendship ties and decreased attachment to the community at an individual level (Sampson, 1988).

   Community attachment is crucial to COPC because it leads to involvement. Community involvement has been argued a crucial factor for achieving successful community health interventions (see, for instance: Deuschle, 1982; Fischer, Neve & Heritage, 1999; Mullan & Epstein, 2002) and has been known to have been placed at the very centre of COPC processes (see figure 2, section 2.1; Rhyne, Cushman & Kantrowitz, 1998). The five-step COPC approach presupposes a sense of community as a distinct part of the method: the fifth and last step "community involvement" (see section 2.1).

   Consequently, it is expected that GPs in rural areas -where the community attachment is greater than in urban areas- are more able to engage the community in their practice, and therefore have higher community orientation than GPs in urban areas.

H11: GPs community orientation is higher for GPs in rural areas, as opposed to urban areas

As mentioned before, COPC is a time consuming method. GPs have to be willing to invest time and resources into gaining insights into (sub)community health and thinking up, implementing and evaluating (preventive) community oriented projects. On top of that, community oriented care has no strong tradition in European general practice (Boerma, 2003)

and is thus by no means compulsory, but rather outreaching GP behaviour. GPs are left with the question: 'is COPC worth the extra work?'

This paper argues that in communities with high percentages of socially disadvantaged and/or ethnic minority patients, it is. Communities with a high percentage of socially disadvantaged and/or ethnic minority individuals have a lower overall health status than communities with lower percentages of socially disadvantaged and/or ethnic minority individuals.

This assumption is substantiated by the WHO (2012), which stresses that the lower people's socioeconomic status is, the more likely they are to show behaviour that is detrimental to health such as smoking, high alcohol consumption and having a poor diet. Additionally, Kirby & Kaneda (2005) have found that having living in a neighbourhood with low socioeconomic status increases the likelihood of having unmet care needs.

Overall health status for communities with high percentages of ethnic minorities is lower as well. Betancourt et al. (2016) found that members of minority communities in the United States are more likely to be socioeconomically disadvantaged, live in areas with detrimental influences regarding health (such as air pollution) and have jobs with higher liability of occupational hazards, compared to members of the majority population. Additionally, Nielsen and Krasnik (2010) found that ethnic minority groups in Europe are more likely to have self-perceived detrimental health than majority populations, even after controlling for age, gender and socioeconomic factors.

GPs who practice COPC is communities with high percentages of socially disadvantaged and/or ethnic minority individuals might thus make greater gains regarding community health status than GPs who practice COPC is communities with low percentages of socially disadvantaged and/or ethnic minority individuals. Also, COPC has historically been implemented predominantly in underserved communities (Deuschle, 1982) and is commonly viewed as a method to "organize services for the disadvantaged alone and not an option for society as a whole" (Tollman, 1991: p. 637).

Therefore, it is argued that GPs in communities with high percentages of socially disadvantaged and/or minority individuals are more likely apply COPC methods than GPs in communities with low percentages of socially disadvantaged and/or ethnic minority individuals. From this assumption follows the expectation that GPs in areas with high percentages of socially disadvantaged and/or ethnic minority individuals have higher community orientation than GPs in areas with lower percentages of socially disadvantaged and/or ethnic minority individuals.

H12a: GPs community orientation is higher in areas with a higher percentage of socially disadvantaged patients than GPs community orientation in areas with a lower percentage of socially disadvantaged patients

H12b: GPs community orientation is higher in areas with a higher percentage of ethnic minority patients than GPs community orientation in areas with a lower percentage of ethnic minority patients

In the next section, GP conditions and hypotheses are discussed.

2.5 GP conditions and community orientation

Individual GP community orientation is related to country- and practice- characteristics, as discussed in sections 2.3 and 2.4, as well as individual characteristics. In the next section, three hypotheses are formulated regarding two individual GP characteristics. One hypothesis on having other paid, professional activities next to being a GP and GP and two hypotheses regarding GP gender.

2.5.1 GP hypotheses

Community oriented primary care requires extra effort on the part of individual GPs. In order to be community oriented, a GP has to invest time in the community: (s)he has to take the time to, for instance, get insight into the community and subcommunities and think up, implement and evaluate preventive community health projects. Because it is likely that GPs with no other paid, professional activities have more time than GPs who do have other, paid professionals, it is expected that GPs who do not have any other paid activities next their work as a GP are more community oriented than GPs who do.

H13: GPs community orientation is higher when they have no other paid, professional activities

GP gender, too, is expected to have an an effect on GPs community orientation. Women in general are often assumed to take on a more communal role than men do: caregiving, for most women (especially wives), is generally an extension of their normal social roles of family nurse and household manager, whereas caregiving involves the assumption of an entirely new role for many men (Allen, 1994). On the basis of this theory, it is expected that female GPs community orientation is higher than male GPs community orientation. This expectation is substantiated by findings of Boerma (2003), which indicate that female GPs were more involved in preventive health education than male GPs.

However, it can also be argued that female GPs have *lower* community orientation than male GPs, because women in general are often more burdened than men with household- (Blanton & Gilliard, 2005) and care tasks (Alen, 1994), which gives them less time to put in the extra work that COPC takes, such as thinking up, implemented and evaluating COPC projects.

This claim, too, is supported by findings of Boerma (2003), who found that female GPs more often work part-time and thus have less office contacts a day and make fewer home visits than male GPs. Based on this theory, it is expected that community orientation is lower for female GPs than it is for male GPs. Two contradictory hypotheses are formulated.

H14a: GPs community orientation is higher for female GPs than for male GPs

H14b: GPs community orientation is higher for male GPs than for female GPs

2.6   Overview of hypotheses

All hypotheses have been explained and formulated. In figure 3, an elaboration on the schematic representation of the empirical strategy (figure 1) is given, which includes all hypotheses from sections 2.3 - 2.5. In the next section, data and methods that are used to test all hypotheses are described.

Figure 3: Schematic representation of hypotheses
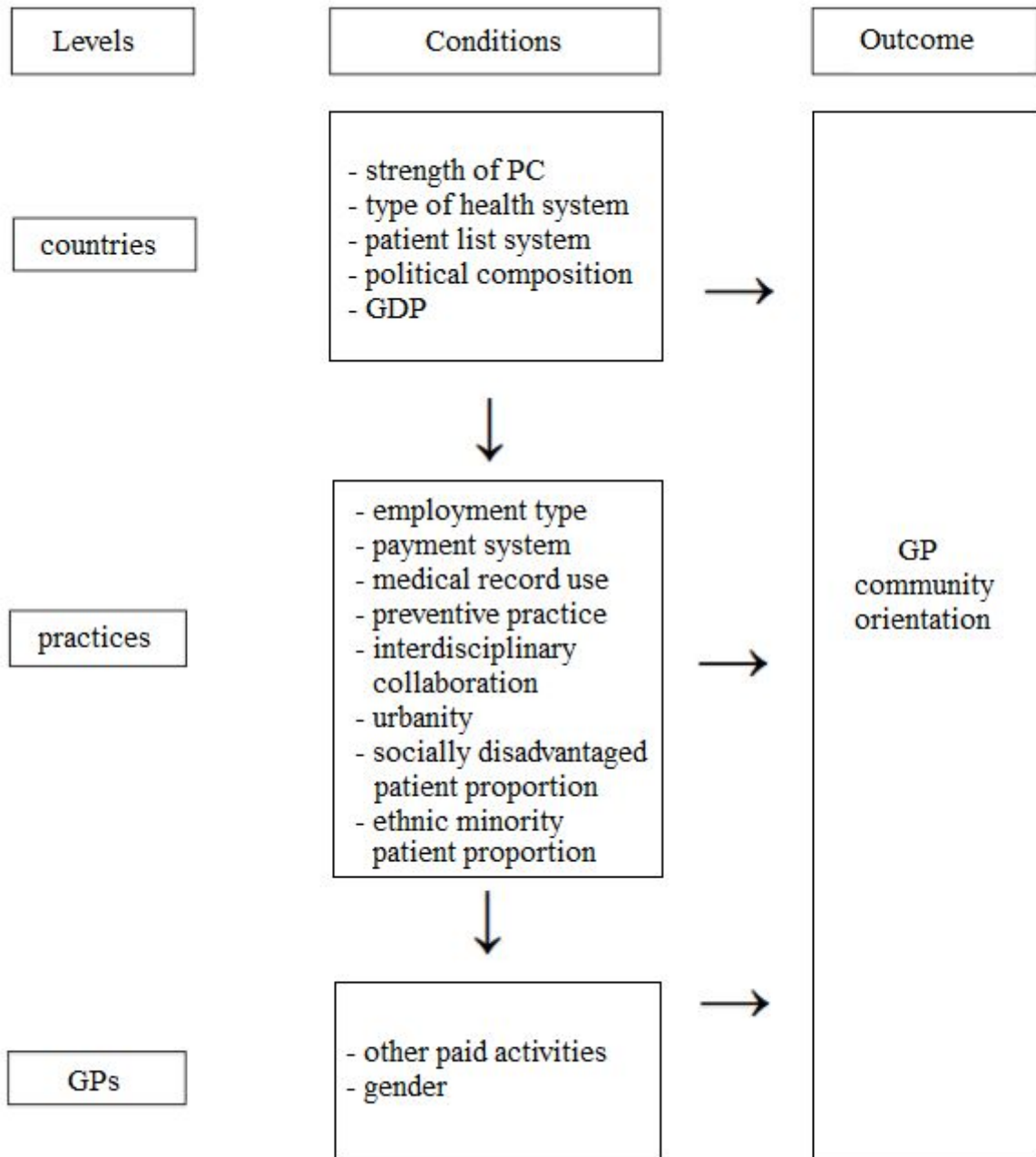
3   Data and methods

3.1   Dataset

The 'Quality and Costs of Primary Care in Europe' (QUALICOPC) project was coordinated by NIVEL (the Netherlands Institute for Health Services Research) and co-funded by the European Commission under the 7th framework programme. This study uses one of the four questionnaire developed for the QUALICOPC study: the GP questionnaire. Questions for this survey were derived from existing, validated questionnaires such as the Primary Care Evaluation Tool, the Primary Care Assessment Tool and the European GP Task Profile Survey (Schäfer, 2016: chapter 8).

In total, the QUALICOPC GP dataset contains data on 7414 GPs from 34 countries. In each country, a nationally representative sample of GPs filled in the questionnaire (approximately N = 220 GPs per country, except for Cyprus, Iceland, Luxembourg and Malta: N = 80 GPs)(Schäfer, 2016: chapter 7). One GP per practice was surveyed.

Groenewegen, Greß & Schäfer (2016), who described recruitment procedures and participation rate for the QUALICOPC study, found that GP respondents were nationally representative for the population of GPs in their country, in terms of age and gender: 52,5% are female and the average age is 50,3.

Furthermore, some variables in the dataset have substantial missing values: perceived ethnic minority patient proportion of practice population (8,3%), perceived socially disadvantaged and patient proportion of practice population (6,4%) and various income-related variables: out-of-pocket payments (8,2%) capitation payments (7,3%) and fee-for-service payments, performance payment and 'other payment' (5,3%). This problem was accounted for by taking these variables into analysis as categorical variables with a 'missing' category, in order to not lose cases. MLwiN automatically creates dummies for categorical variables, if they are entered into the model as categorical variables. The creation of a 'missing' category thus resulted in an extra dummy for categorical variables. It was the intention to report results for these missing categories, if significant, because a significant coëfficient for a dummy for missing values points to the fact that missings may not be at random. However, no missing categories were significant, indicating that missing values are not selective.

3.2   Operationalizations

Dependent variable

Question 58 from the QUALICOPC GP questionnaire is used to measure degree of community orientation as the degree to which GPs are *externally* oriented. This operationalisation is used as a proxy for community orientation, based on methods of

previous research (see, for instance Pavlič et al., 2015; Schäfer, 2016) and for reasons of availability in the QUALICOPC dataset.

The three components 'repeated industrial accidents', 'frequent respiratory problems' and 'repeated food poisoning' are combined in a scale from 3-12, which measures how externally oriented (as opposed to focused on the practice and individual patients) GPs are. 3 on the external orientation scale means 'least externally oriented' and 12 means 'most externally oriented'.

Q58

If you were confronted through your patient contacts with the following occurrences, would you report this (for instance to an authority)? (repeated accidents in an industrial setting, frequent respiratory problems in patients living near a certain industry, repeated cases of food poisoning among people living in a certain district)
[yes / probably yes / probably not / no / don't know]

Missing data for the components were relatively high: 7,70% (571 cases) for industrial accidents, 7,75% (575 cases) for respiratory problems and 4,64% (344 cases) for food poisoning, making the total percentage of missing values for the dependent variable 11,03% (818 missing cases).

This relatively high percentage of missing cases was accounted for by recoding all cases that were missing as 'don't know' into the category 'probably not'. It was assumed that GPs who filled in 'don't know' are most likely not externally oriented. After having recoded the items, missing values for repeated industrial accidents were 0,86% (64 cases), 0,93% for respiratory problems (69 cases) and 0,89% for food poisoning (66 cases), making the total percentage of missing values for the dependent variable 1,20% (89 cases).

In order to make sure that the three items form a coherent scale, correlations between them were calculated (table 1). The three items correlate relatively strongly to each other: 'repeated accidents' correlates relatively strongly with 'frequent respiratory problems' (r = .713) as well as with 'repeated food poisoning (r = .635) and 'frequent respiratory problems' and 'repeated food poisoning correlate strongly as well (r = .699).

Table 1: Correlations between three components of external orientation

Q58	repeated accidents	frequent respiratory problems	repeated food poisoning
repeated accidents	1,000	-	-
frequent respiratory problems	0,713	1,000	-
repeated food poisoning	0,635	0,699	1,000

Factor analysis reveals that the items, combined in a scale, all have eigenvalues above 1 (1,92). Scree plot analysis shows that 1 factor is necessary to represent the three items. Value loadings on the factor are all above .3 (respectively .788; .839; .776), and unexplained variation ranges from .2968-.3977. Uniqueness values are .38; .30; .40, which means communalities (1 - uniqueness) are relatively high, as is reflected in the correlations in table 1.

Rotations (varimax as well as promax) did not substantially change the outcome of the factor loadings or eigenvalues, and are therefore not used for scale construction.

Overall scale KMO is .7298, with every individual variable scoring above .5, which means no variables need to be removed from the factor. Scale overall reliability coëfficient (alpha) is .865, indicating that the external orientation scale can be reliably used as a dependent variable.

Independent variables: country level

Country level variables were operationalized with data external to the QUALICOPC GP dataset. Most influential sources were reports from the European Observatory on Health Systems and Policies, the Comparative Political Data Set III 1990-2010, Kringos et al., (2015a) and the World Bank.

Table 2: Operationalisations country hypotheses

Variable	Operationalisation	Missing values	Data source
Type of healthcare system	2 dummies: SHI with 0 = NHS or TRANS and 1 = SHI, and TRANS with 0 = NHS or SHI and 1 = TRANS	for both dummies: 0 cases missing	European Observatory on Health Systems and Policies (2006a; 2006c; 2011); Mossialos & Wenzl (2016); Healthcare in Transition (appendix B)
Political composition	Measured following Kringos, 2012 (chapter 7), using the weighted number of years left-wing parties were in power in the period 1960-2014. In order to differentiate for the different influence of 100% left-wing governments versus coalition governments, years were divided into 4 subcategories in which left-wing parties held respectively 100%, 66.6%>, 33.3-66.6%, <33.3%, 0% of the total cabinet posts, weighted by the number of days the government was in office in that year*	8,7%, 641 cases missing (FYR Macedonia, Switzerland and Turkey)	Variables 'gov_left1', 'gov_cent1' and gov_right1' from Armingeon et al, Comparative Political Data Set III 1990-2010 (appendix B)
Patient list systems	dummy with 1 = patient list system; 0 = no patient list system	0 cases missing	Kringos et al, 2015a: chapter 3; College of Physicians and Surgeons of British Columbia, 2004; Gauld, n.d.; McCartney, n.d.; Medical Board of Australia, n.d.; Medical Council of New Zealand, 2008; Olson, 2006: chapter 4 (appendix B)

Variable	Operationalisation	Missing values	Data source
GDP	$ x million	0 cases missing	European Commission (2016a), The World Bank (2016a; 2016b), OECD (2007; 2009), World Health Organisation (2016)(appendix B)
Strength of primary care structure	Strength of primary care structure on a scale 1 - 3 for which 1 = low primary care orientation and 3 = high primary care orientation	0 cases missing	Kringos, 2012: chapter 7, p. 200 (appendix B)

* A time-lag exists between the coming to power of a government and the effects of policy it implements. Therefore, the length of time in power needs to be taken into account (Kringos, 2012: chapter 7)

Independent variables: practice level

Practice level data were all operationalized using data from the QUALICOPC GP questionnaire.

Table 3: Operationalisations practice hypotheses

Variable	**Operationalisation**	**Missing values**	**Data source**
Practice organizational structure	**Q15** As a GP, are you self-employed or in salaried employment? [Salaried employment with centre or authority; salaried employment with other GP; self-employed with contract(s) with health service, insurance or authority; self-employed without contract] Recoded into a dummy with 0 = salaried employment with centre or authority; 1 = self-employment; salaried employment with other GP*	0 cases missing	QUALICOPC GP questionnaire
Payment system	**Q16** For each of the following components please estimate whether they contribute to your income as a GP [Salaried/ capitation/ fee-for-service/ out of pocket payments/ performance payment/ other] Recoded into 5 dummies with 0 = fee for service and 1= salaried; capitation; out of pocket; performance payment; missing.	0,9%, 65 cases missing (distributed over 13 countries, most notably Canada with 47 missing values)	QUALICOPC GP questionnaire
Medical record keeping	**Q42** In the past 2 years, have you used your medical record system to generate health records of patients on the basis of age, diagnosis or	4,3%, 316 cases missing (distributed over 19 countries, most notably Belgium	QUALICOPC GP questionnaire

	risk?) Recoded into two dummy variables with 0 = no record use; 1 = record use; missing	with 272 missing values)	
Interdisciplinary collaboration	**Q44** How often do you meet face-to-face with the following professionals (other GP, practice nurse etc.) **Q45** How often do you ask from the following medical specialists (paediatrician, internist, etc)? [seldom/never / every 1-3 months / more than once a month] Answer categories were the same for both questions, they were recoded into missing values + seldom/never = 0 and every 1-3 months + more than once a month = 1. After that, the resulting dummies were recoded into two continuous variables with range 0-10 for Q44 and range 0-9 for question 45 (depending on the amount of experts in the question)	Q44 + Q45: no cases missing	QUALICOPC GP questionnaire
Urbanity	**Q4** How would you characterise the place where you are currently practising? [big (inner)city / suburbs / (small) town / mixed urban-rural / rural] Recoded into 5 dummy variables with 0 = big (inner) city and 2 = suburbs; (small) town; mixed urban-rural; rural; missing	1,1%, 84 cases missing (relatively evenly distributed over 26 countries)	QUALICOPC GP questionnaire
Socially disadvantaged and ethnic minority patients	**Q6** To what extent do you think your practice population compares to the average national level with respect to the following categories? Socially disadvantaged people; Ethnic minority people [below average / average / above average / don't know]. Both variables recoded into 3 dummy variables with 0 = average and 1 = below average; above average; missing	Socially disadvantaged: 6,4%, 474 cases missing (relatively evenly distributed over all countries but Australia, which has no missing values) Ethnic minorities: 8,3%, 615 cases missing (relatively evenly distributed over all countries but Denmark)	QUALICOPC GP questionnaire
Preventive work	**Q53** & **Q54** When do you, or your staff, measure blood pressure; blood cholesterol level? [In connection with relevant clinical conditions/ on request/ routinely in office contacts with adults/ in adults invited for this	Q54 1,0%, 71 cases missing (distributed over 25 countries, most notably Slovakia and Finland with 10 and 8 missing values)	QUALICOPC GP questionnaire

purpose/ no such measures]. Recoded into a variable with range 0-2, for which 0 = no routine preventive work, 1 = either blood pressure or cholesterol level, 2 = both blood pressure and cholesterol level	Q55 1,9%, 137 cases missing (distributed over 32 countries, most notably Slovakia and FYR Macedonia with 15 and 13 missing values)	
Q55 To what extent are you involved in health education on the following topics? Smoking, diet, problematic use of alcohol, physical exercise [not involved/ in connection with normal patient contacts/ in group sessions of special programmes]. Recoded into variable with range 0-4 for which 0 = no preventive education and 4 = 4 forms of preventive education		

* It is argued that GPs who are in salaried employment with another GP work in practices with a practice vision that is that of the vision of the self-employed head of the practice. GPs who are in salaried employment with another GP are added to the category 'self-employed'.

Independent variables: GP level

GP level variables were all operationalized using data from the QUALICOPC GP questionnaire.

Table 4: Operationalisations GP hypotheses

Variable	**Operationalisation**	**Missing values**	**Data source**
Other paid, professional activities	**Q14** Beside your work as a GP in this practice, do you have any other paid professional activities? [No; yes, as a private physician/in residential setting/company doctor/ medical education/ other] Recoded into two dummy variables with 0 = no paid side activities; 1 = paid side activities; missing	12,5%, 929 cases missing (distributed over 31 countries, most notably Canada and Belgium with 111 and 79 missing values)	QUALICOPC GP questionnaire
Gender	**Q1** Are you male or female? [male/ female] Recoded into two dummy variables for which 0 = male; 1 = female; missing	0,4%, 28 cases missing (distributed over 15 countries, with no notable extremes)	QUALICOPC GP questionnaire

Independent variables: control variables

Control variables were all operationalized using data from the QUALICOPC GP questionnaire.

Table 5: Operationalisations control variables

Variable	Operationalisation	Missing values	Data source
GP age	**Q2** What is your year of birth? [19..] Recoded into a variable with range 26-79 in absolute years	1,23%, 78 cases missing (distributed over 26 countries, most notably Canada with 12 missing values)	QUALICOPC GP questionnaire
Financial incentive for preventive work	**Q17.3** Can you receive an extra financial incentive or bonus for: achievement of targets for screening or prevention? Recoded into two dummy variables with 0 = no financial incentive; 1 = financial incentive; missing	1,9%, 142 cases missing (distributed over … countries, most notably Belgium with 24 missing values)	QUALICOPC GP questionnaire
Shared accommodation	**Q18** Do you work alone or in shared accommodation with one or more GPs and/or medical specialists? [alone/ with _ other GPs in shared accommodation] Recoded into two dummy variables with 0 = solo practice; 1 = duo/group practice; missing	0,97%, 72 cases missing (distributed over 18 countries, most notably Belgium, Finland and Latvia, with 18, 16 and 13 missing values)	QUALICOPC GP questionnaire

A correlation check, in which all independent variables were paired, revealed that no two independent variables are subject to multicollinearity: the highest correlations between variables exist between perceived proportion of socially disadvantaged patient population and perceived ethnic minority proportion of patient population (r = .571) and the dummy variable for SHI systems and patient list systems (r= -.626). Indeed, even variables that were expected to correlate did not strongly relate to each other (for instance, the two preventive practice variable correlate with r = .301).

3.4   Method of analysis

Data is analyzed with Stata 14 and MLwiN 3.00, using hierarchical multi-level analysis with countries and practices as levels. Individual GPs were not used as a separate level, because only one GP was interviewed per practice and thus the practice and the GP level contain exactly the same information.

For practice level results a maximum level of significance of $\alpha = 0.05$ is adopted, because p-values are strongly influenced by the amount of cases in analysis. A broad p-value, in this analysis of ~7500 cases, would therefore possibly yield falsely positive outcomes. For

country level results, a maximum level of significance of $\alpha = 0.1$ is adopted, since there are only 34 countries units of analysis - the countries.

3.4.1 Modelling strategy

The modelling strategy was as follows: after sorting the multilevel hierarchy, GP characteristics (gender, age, other paid activities) were introduced into the model, after that practice characteristics in four sets: structure characteristics, methods, resources and task environment. The resulting model was used as a base model for the different country models. Each country model contained up to three variables, because as a rule of thumb the number of units of analysis (countries, in this case) should be at least ten times as great as the number of variables included in multilevel analysis (Leyland & Groenewegen, 2016: chapter 9). As a result, country level variables were tested in separate models.

Table 6: Modelling strategy

M0: external orientation = constant + hierarchical structure specified

M1: external orientation = constant + hierarchical structure specified + **GP characteristics (+ control: age)**

M2: external orientation = constant + hierarchical structure specified + GP characteristics + **practice characteristics set 1** (organizational structure + payment system)

M3: external orientation = constant + hierarchical structure specified + GP characteristics + practice characteristics set 1 + **practice characteristics set 2** (medical record keeping + preventive methods + control variable financial incentive for preventive work)

M4: external orientation = constant + hierarchical structure specified + GP characteristics + practice characteristics set 1 + practice characteristics set 2 + **practice characteristics set 3** (2 interdisciplinary variables)

M5: external orientation = constant + hierarchical structure specified + GP characteristics + practice characteristics set 1 + practice characteristics set 2 + practice characteristics set 3 + **practice characteristics set 4** (urbanity, socially disadvantaged patients, ethnic minority patients + control variable shared accommodation)

Model 5 is used as a base model for country analysis: all country models will contain all GP and practice characteristics, to which country level variables are added.

M6: model 5 + **GDP**
M7: model 5 + GDP + **type of healthcare system**
M8: model 5 + GDP + **political composition**
M9: model 5 + GDP + **patient list systems**
M10: model 5 + GDP + **strength of primary care**

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4 Results

The presentation of the results starts with a description of GP external orientation in the 34 (mostly European) countries in the QUALICOPC dataset, in section 4.1. After that, GP- and practice level relationships with GPs external orientation are discussed in section 4.2. Finally, in section 4.3, country level relationships with GP external orientation are discussed.

It is not possible to deduce causal relations from multilevel regression analysis, therefore there will not be spoken of 'effects' throughout the results and conclusion section, but of variables that are 'related to' GPs external orientation.

4.1 Distribution of GPs external orientation

Using the external orientation scale as defined in section 3.2, the mean scores of external orientation per country were calculated. As table 7 shows, the Netherlands, Norway, Turkey, Greece and Italy have the highest mean scores on GP external orientation and Estonia, Cyprus, Luxembourg, Hungary and Portugal have the lowest mean scores on GP external orientation.

Table 7: Mean external orientation scores per country, from highest to lowest

Country	μ external orientation score	Country	μ external orientation score
Netherlands	10,80	Romania	9.70
Norway	10,66	Poland	9.69
Turkey	10,60	Switzerland	9.65
Greece	10,37	Czech Republic	9.61
Italy	10,23	Belgium	9.58
Spain	10.22	Canada	9.55
Iceland	10.09	Finland	9.52
Malta	10.09	Slovakia	9.51
England (UK only)	10.05	Australia	9.44
New Zealand	9.93	Sweden	9.31
Austria	9.85	Germany	9.11
Slovenia	9.85	Latvia	9.11
FYR Macedonia	9.82	Portugal	9.10
Bulgaria	9.79	Hungary	8.17
Denmark	9.74	Luxembourg	7.72
Ireland	9.71	Cyprus	7.59
Lithuania	9.71	Estonia	7.48

In figure 4, all 34 countries from the QUALICOPC dataset are divided into three categories: low, medium and high GP external orientation. The Netherlands, Norway, Turkey, Greece, Italy, Spain, Iceland, Malta, England, New Zealand, Austria and Slovenia have scored high on GP external orientation, whereas FYR Macedonia, Bulgaria, Denmark, Ireland, Lithuania, Romania, Poland, Switzerland, Czech Republic and Canada have scored medium on GP external orientation and Finland, Slovakia, Australia, Sweden, Germany, Latvia, Portugal, Hungary, Luxembourg, Cyprus and Estonia are low on GP external orientation.

Figure 4: Mean level of external orientation per country
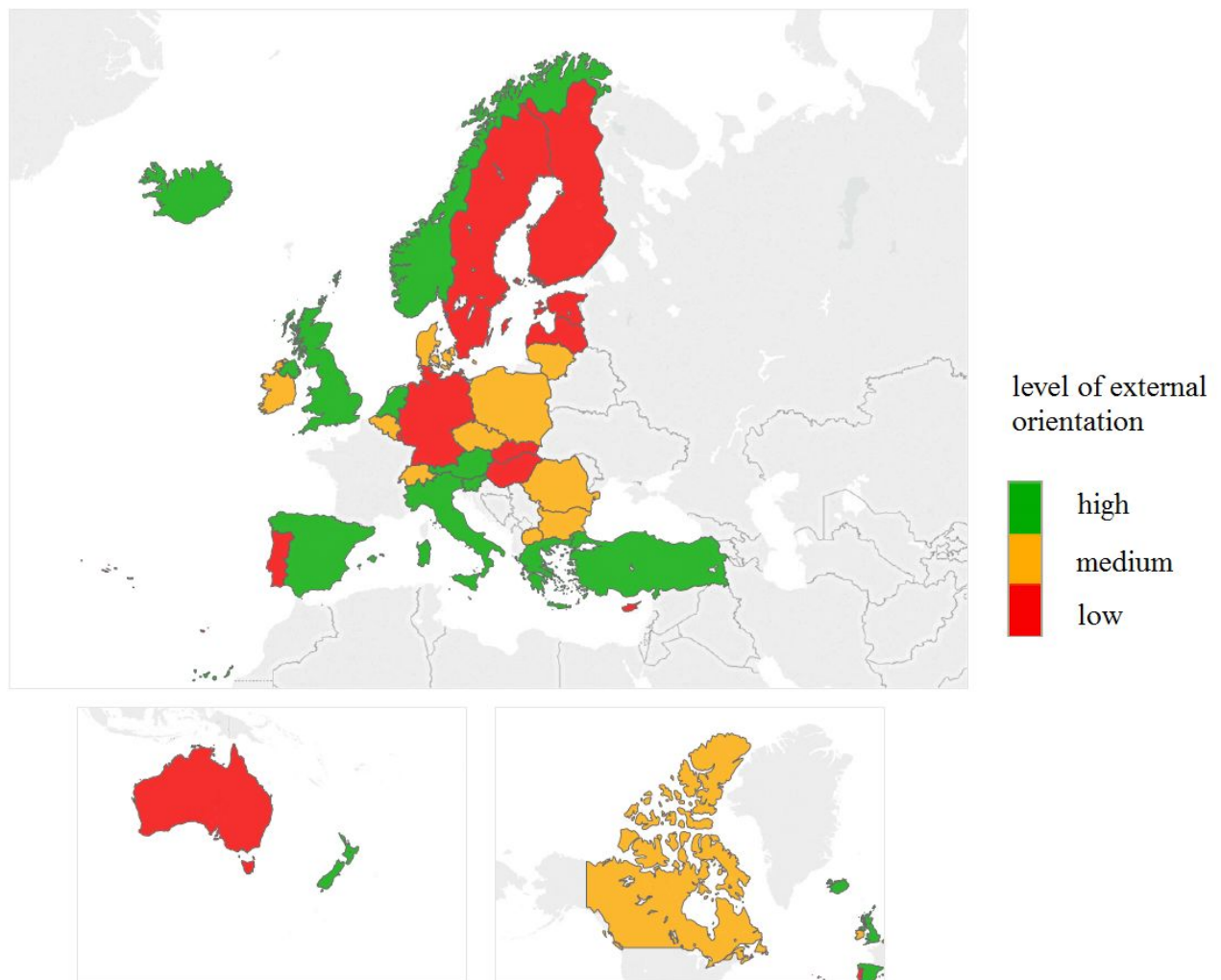
The most southerly located European countries have a tendency to do very well regarding GP external orientation (except for Portugal and Cyprus, who score low), together with some of the most westernly located countries: the UK, the Netherlands (but not Ireland and Belgium, who score medium).

GPs from central- and eastern European countries such as Slovakia, Hungary, Latvia, Estonia and Germany, and also to a lesser degree GPs from Lithuania, Poland, the Czech Republic, Switzerland, Romania and do not seem to score high on GPs external orientation, just as the Scandinavian countries (except for Norway).

From the Balkan countries, FYR Macedonia's and Bulgaria's GPs score medium on external orientation, whereas Greek and Turkish GPs score very high.

From the Scandinavian countries, Norway scores very high, whereas Denmark and Iceland score medium and Sweden and Finland score low.

4.2 The relationship of GP- and practice characteristics with external orientation

In this section, the first and last model from the multilevel regression results of the relationship between GP- and practice characteristics and GP external orientation are shown in table 8. All intermediate models can be found in appendix C.

Table 8: Multilevel regression results of the interrelation between GP- and practice characteristics and GP external orientation

	M0	M5
	B (SE)	B(SE)
y = external orientation		
Fixed coefficients		
constant	9.611(.116)***	8.170(.222)***
level: GP		
female (ref =male)		-.112(.050)
other paid activities		.162(.058)**
age (centred around mean)		-.052(.035)
level: practice		
self-employed (ref = salaried)		.132(.081)
payment system (ref = ffs)		
- salary		-.163(.109)
- capitation		-.002(.109)
- out of pocket, perf. pay + other		-.044(.094)
medical records (ref = no medical use record)	.	004(.056)
routine preventive work		
- blood pressure + cholesterol		.171(.035)***
- preventive education		.190(.032)***
Financial incentive for preventive work (ref = no)		.010(.060)
interdisciplinary meeting		.051(.012)***
interdisciplinary advice		.053(.009)***
urbanity		
- suburbs		-.021(.081)
- (small) town		.127(.067)
- mixed urban-rural		.172(.074)**
- rural		.411(.075)***
soc. disadvantaged (ref = average)		
- below average		.084(.058)
- above average		.078(.065)
ethn. minorities (ref = average)		
- below average		-.145(.059)**
- above average		.069(.078)
shared accommodation (ref = solo)		-.089(.256)

Random coefficients

level: country		
variance	.438(.112)**	.468(.119)**
level: practice		
variance	3.912(.064)***	3.734(.063)***
total variance	4.350	4.202
N: country	34	34
N: practice	7414	7162
ICC	.101	.112
-2*loglikelihood	31259.46	29870.02
change in -2LL(df)	-	M0: -1389.44(22)***

*** p < 0.001; ** p < 0,05

Table 8, model M0 shows an 'empty' model with only the constant and intraclass correlation. The intraclass correlation in this model is ICC = .101 with var(u_{0j}) = .438 (p < .05) and var(e_{0ij}) = 3.912 (p < .001), indicating that around 10% of the variance in external orientation is due to relationships with country level characteristics. The remaining ~90% of variation in external orientation is at the GP- and practice level.

Model 5 shows the full model, with all GP- and practice level variables added. The GP characteristics are discussed first: whether or not GPs have other paid activities next to their job as a GP, gender and the control variable age.

The model shows that having other paid activities (being a private physician, working in a residential setting, as a company doctor or giving medical education) next to working as a GP seems to have a positive relation with GPs external orientation (B= .162; p < .05), refuting hypothesis 13, which stated the reverse: it was expected that GPs who have other paid activities are less community oriented than GPs who do not have other paid activities.

GP gender does not have a significant relationship with GP external orientation, refuting both hypothesis 14a and 14b, which contrastingly stated that "GPs community orientation is higher for female GPs than for male GPs" and that "GPs community orientation is higher for male GPs than for female GPs". The control variable age, too, has no significant relationship with GP external orientation.

From the practice characteristics, only the two preventive practice variables, the two interdisciplinary collaboration variables, the two most rural categories of urbanity and a perceived proportion of below average ethnic minority patients have a significant relationship with GPs external orientation.

With regard to preventive practice, GPs could indicate when they or their staff measured blood pressure or blood cholesterol level (in connection with relevant clinical conditions, on patient request, routinely in office contacts with adults, in adults invited for this purpose or not at all) and to what extent they are involved in preventive health education (related to smoking, diet, problematic use of alcohol and physical exercise). Both forms of

preventive work are highly significant in relation to GP external orientation (respectively B= .171; B= .190 with p < .001). This confirms hypothesis 9, which stated that "GPs community orientation is higher when they practice preventive care than when they do not practice preventive care".

For the two interdisciplinary collaboration variables, GPs indicated whether they met face-to-face with professionals (for instance other GPs, practice nurses, etc.) and whether they regularly ask advice from other medical specialists (such as paediatricians, internists, etc.) and how often this occurs (seldom, never, every 1-3 months or more than once a month). The analysis shows that both meeting with professionals and asking advice from specialists are positively related to GPs external orientation (respectively B= .051; B=.053; p < .001). This confirms hypothesis 10: "GPs community orientation is higher when they make use of interdisciplinary resources than if they do not make use of interdisciplinary resources".

For the urbanity variable, GPs were asked to characterise the practice where they were currently working as a big (inner) city, suburb, (small) town, mixed urban-rural area or rural area. Analysis shows that working as a GP in a mixed urban-rural area (B= .172; p < .05) or rural area (B= .411; p < .001) differs significantly from working as a GP in a big (inner) city. Practicing in more a rural areas increases the chance of a higher degree of GP external orientation as rurality increases. Working in a (small) town or suburb does not differ significantly from working in a big (inner) city (respectively B= -.021; B=.172; p > .05). This analysis confirms hypothesis 11, stating that "GPs community orientation is higher for GPs in rural areas, as opposed to urban areas".

Lastly, the proportion of socially disadvantaged and ethnic minority patients was measured using GPs perception of their patient population. GPs could indicate whether they perceived their patient population as below average, average or above average regarding socially disadvantaged and ethnic minority patients. An average perceived proportion was taken as the reference group.

The proportion of socially disadvantaged and GPs perception of either below or above average proportions of socially disadvantaged patients did not have a significant relationship with GP external orientation (respectively B= .024; B= .035 with p > .05), refuting hypothesis 12a, which stated that "GPs community orientation is higher in areas with a higher percentage of socially disadvantaged patients than GPs community orientation in areas with a lower percentage of socially disadvantaged patients".

Hypothesis 12b, which stated that "GPs community orientation is higher in areas with a higher percentage of ethnic minority patients than GPs community orientation in areas with a lower percentage of ethnic minority patients", is partly confirmed: there is no relationship with external orientation when GPs perceive an above average proportion of ethnic minority patients (B=.069; p < .05), but there is a negative relationship with GPs external orientation when GPs perceive a below average ethnic minority proportion of their patient population (B= -.145; p < .05).

From the practice level variables, type of employment, payment system, using medical records to generate health records, receiving a financial incentive for preventive work, GP perception on proportion of socially disadvantaged and (partly) ethnic minority patients do

not have a significant relationship with GPs external orientation. Hypotheses 6, 7, 8, 12a and (partly) 12b are thus refuted.

Model 5, with all GP- and practice variables added, is a significant improvement over model 0 with a change of -1389.44 in -2LL, with 22 degrees of freedom (p < .001). The ICC has increased from ICC = .101 to ICC = .112, indicating that the variance at country level has increased while the variance at practice level has decreased by adding GP- and practice level variables.

4.3.1. Summary of GP- and practice level results

GPs who have other paid activities next to working as a GP, practice preventive care, collaborate with other professionals and who practice in a more rural area are significantly more externally oriented than their colleagues who do not. Additionally, if GPs perceive the proportion of ethnic minority patients as below average are significantly less externally oriented.

GP gender and age, type of payment system and employment, using medical records, receiving financial incentives for preventive practice, practicing in a more urban area, GPs perception of proportion of socially disadvantaged patients and (partly) GPs perception of proportion of ethnic minority patients and working in shared accommodation do not have a significant relationship with external orientation.

4.3   The relationship of country characteristics with external orientation

In this results section, all country variables are added to the complete practice- and GP-level model (M5). The GP- and practice level variables will not be displayed in models 6-10, however their effects are included in the models.

Each country level model can contain only up to three independent country-level variables, because of the general rule of thumb in multilevel analysis that every analysis needs at least ten times more units of analysis than variables (Leyland & Groenewegen, 2017). Therefore, independent country variables are removed from analysis each time before entering new independent country variables in the next model, except for GDP, which is a control variable. Each new model is compared to the baseline model with only GP- and practice level variables, model 5.

Table 9a: Multilevel regression results of the interrelation between GP-, GP practice- and country characteristics and GP external orientation, including all GP- and practice level variables

	M6	M7	M8
	B (SE)	B (SE)	B (SE)
y = external orientation			
Fixed coefficients			
constant	8.129(.236)***	8.383(.272)***	8.067(.312)***
level: country			
GDP	.000(.000)	-.000(.000)	.000(.000)
type of HC system (ref = NHS)			
- SHI		-.128(.283)	
- TRANS		-.558(.285)*	
political composition			.003(.015)
patient list system			
strength of primary care			
Random coefficients			
level: country			
variance	.464(.118)**	.414(.106)**	.423(.114)**
level: practice			
variance	3.734(.063)***	3.734(.063)***	3.773(.066)***
total variance	4.198	4.148	4.196
N: country	34	34	31
N: practice	7162	7162	6542
ICC	.111	.111	.101
-2*loglikelihood	29869.77	29866.10	27347.39
change in -2LL(df)	M5: -0.25(1)	M6: -3.67(2)	M6: -2522.38(1)***

note: all models in this table include all GP and practice characteristics
*** p < 0.001; ** p < 0,05 * p < 0,1

In model 6, the variable GDP is added. GDP is measured in dollars (x million) per country. The analysis shows that countries' gross domestic product does not have a significant relationship with GPs external orientation (B= .000; p > .1), thereby refuting hypothesis 5, which stated that "GPs community orientation is higher in countries with lower gross domestic product than in countries with higher gross domestic product".

The practice- and country variances are however significant with var(u_{0j}) = .464 and var(e_{0ij}) = 3.734, showing a very slight decrease in country variance in comparison with model 5 (var(u_{0j}) = .468). This change is not significantly reflected in the ICC, which was ICC = .112 in model 5 and becomes ICC = .111 is model 6. The model is no significant improvement to model 5 (change in -2LL = -0.23 with 1 df).

In model 7 type of healthcare system is added to model 6. Type of healthcare system consists of two dummy variables representing SHI and transitional systems, both with NHS systems as the reference category. The two dummies have no missing values; the country- and practice N remain the same as in model 5 and 6.

Of the two healthcare system variables, only transitional systems show an influence on GPs external orientation (B= -.558; p < .1): it appears that GPs in transitional healthcare systems are less likely to be externally oriented than GPs in national health systems. This result can also be seen when looking at figure 4. GPs in social health insurance systems do not differ significantly from GPs in national health system in the QUALICOPC dataset. This partly confirms and refutes hypothesis 2, which stated that "GPs community orientation is higher in NHS systems than GPs community orientation in SHI or transitional healthcare systems". The hypothesis is refuted in the sense that GPs in NHS systems do not seem to be more externally oriented than GPs in SHI systems. However, it is partly confirmed because GPs in transitional healthcare system do indeed seem to be significantly less externally oriented than GPs in NHS systems

The country variance in model 7 drops to $\text{var}(u_{0j}) = .414$, which reflects the fact that countries have only one type of healthcare system; the variable can thus not vary within countries. This is however not reflected in the ICC, which maintains to be ICC = .111.

Political composition is added to model 8, after removing the type of healthcare system dummies. Political composition was measured using the weighted number of years left-wing parties were in power in the period 1960-2014, per country. The variable has missing values for FYR Macedonia, Switzerland and Turkey; values on political composition were missing from the Comparative Political Data Set III 1990-2010 that has been used to operationalise this variable. Country N for this model therefore decreases to N = 31, and practice N = 5489.

Political composition does not seem to have a significant relationship with GPs external orientation (B=.003; p > .1), which refutes hypothesis 4, which stated that "GPs community orientation is higher in countries with a longer history of left-wing parties in government than in countries with a longer history of centre- or right wing parties in government".

Adding political composition to the model is however a significant improvement on model 5, with -2LL = - 2522.38 (1 df). A lowered ICC of .101 reflects that countries only have one political system and thus cannot vary within themselves.

Table 9b: Multilevel regression results of the interrelation between GP-, GP practice- and country characteristics and GP external orientation, including all GP- and practice level variables

	M8	M9	M10
	B (SE)	B(SE)	B (SE)
y = external orientation			
Fixed coefficients			
constant	8.067(.312)***	7.780(.299)***	6.272(1.633)***
<u>level: country</u>			
GDP	.000(.000)	.000(.000)	000(.000)
type of HC system (ref = NHS_			
- SHI			
- TRANS			
political composition	.003(.015)		
patient list system		.466(.252)*	
strength of primary care			.854(.742)
Random coefficients			
level: country			
variance	.423(.114)**	.418(.107)**	.445(.113)**
level: practice			
variance	3.773(.066)***	3.734(.063)***	3.734(.063)***
total variance	4.196	4.152	4.179
N: country	31	34	34
N: practice	6542	7162	7162
ICC	.101	.112	.106
-2*loglikelihood	27347.39	29866.51	29868.48
change in -2LL(df)	M6: -2522.38(1)***	M6: 3.26(1)	M6: 1.29(1)

note: all models in this table include all GP and practice characteristics
*** p < 0.001; ** p < 0,05 * p < 0,1

In model 9 political composition is removed and the variable about patient list systems is added. It is a dummy variable which only two values, which indicate whether countries have a patient list system or not. It has no missing values, so the country- and practice level N's are N = 34 and N = 6020, like in model 5, 6 and 7.

Maintaining a patient list system is significantly related to GPs external orientation (B= .466; p < .05), confirming hypothesis 3, which stated that "GPs community orientation is higher in countries where patient list systems are obligatory than in countries where patient list systems are not obligatory". This is reflected in the reduction in -2LL (-3.26 with 1 df), which shows model 9 is a significant improvement on model 5.

Finally, in model 10 patient list systems are removed from analysis and strength of primary care structure is added. This variable was measured on a scale of 1 - 3 for which a

score of 1 means low primary care orientation and a score of 3 means high primary care orientation. This variable has no missing values, so the country- and practice N remain the same as in model 9.

Strength of primary care structure does not seem to have a significant relationship with whether or not GPs are externally oriented (B= .854; p > .1), refuting hypothesis 1, which stated that "GPs community orientation is stronger in countries with stronger primary care structures, than in countries with weaker primary care". This is reflected in the non-significant reduction in -2LL (-1,29 with 1 df), which indicates that model 10 is no significant improvement on model 5.

4.4.1 Summary of country level results

Patient list systems and transitional healthcare system have a significant relationship with GPs external orientation. Having an nationally enforced patient list system for GPs is positively related to GPs external orientation for GPs in the QUALICOPC dataset, and GPs in transitional systems are significantly less externally oriented than GPs in NHS systems, but GPs in SHI do not differ significantly from GPs in NHS system, as was expected.

Countries' gross domestic product, social insurance healthcare systems, political composition and strength of primary care do not have a significant relationship with GPs external orientation.

5   Conclusion and discussion

Overall, country level analysis reveals that the full model explains around 6% of the variance on the GP- and practice level and around 5% from the variance on the country level. This means a lot of variance goes unexplained. Throughout this chapter, recommendations for future research are done, that may increase the amount of explained variance in future analyses.

Dependent variable external orientation
GPs community orientation was measured using 'external orientation' as a proxy. This is not ideal, since being externally oriented does not automatically means that GPs are community oriented as well.

It is advised that future research into COPC measures community oriented *behaviour*, in order to objectively measure GPs community orientation.

Distribution of GP external orientation
Findings on the distribution of GPs external orientation show that the (formerly communist) countries with transitional healthcare systems tend to score relatively low on GPs community orientation (except for Slovenia), in comparison with the other countries in the dataset. This finding is supported by the country level multilevel regression analysis, which shows that countries with transitional healthcare systems are less likely than countries with NHS systems

to have externally oriented GPs. This might be due to the fact that these countries are in transition from former Soviet healthcare systems to national health- or social health insurance systems.

The fact that Slovenia does well in comparison with the other formerly communist countries, is supported by the 'Health care systems in transition' rapport about Slovenia, which states that "Slovenia passed through the critical years of transition with a remarkable degree of success in comparison with many other transition economies" (European Observatory on Health Care Systems, 2002: p.68). The European Observatory (2002) attributes this to the facts that Slovenia made a quick, effective shifts towards compulsory insurance, and voluntary insurance was purchased by a greater share of the population than expected initially. This created additional funds for health care in the early 1990s, which allowed Slovenia to succeed.

Another interesting finding regarding the distribution of GP external orientation is that the Scandinavian countries score very dissimilar. Most notable is that whereas Norway scores very high on GP external orientation (2nd place), Finland and Sweden are in the top seven lowest scoring countries (25th and 28th place). This is most likely due to the fact local authorities in Norway "provide information on health and encourage activities in the community to promote public health and individual health and well-being" (European Observatory on Health Care Systems, 2006b: p. 93). Community orientation projects are thus likely to be more salient to Norwegian doctors than to Finnish or Swedish doctors, possibly increasing their community orientation.

Overall findings on the distribution of external orientation differ from findings of Pavlič et al. (2015), who used the same three questions from the QUALICOPC dataset as a scale for community orientation. They found that Norway, Turkey, Greece, Italy and the Netherlands have the highest composite scores of community orientation, and Cyprus, Estonia, Hungary, Germany and Latvia have the lowest, whereas this paper found a different ranking of top five countries (the Netherlands, Norway, Turkey, Greece and Italy) and two different countries in the bottom five (Estonia, Cyprus, Luxembourg, Hungary and Portugal). These differences are likely the result of the use of different version of the dataset. Pavlič et al. (2015) have used version 4.1 of the QUALICOPC GP dataset, whereas this paper makes use of version 5.1.

The relationship of GP characteristics with GP community orientation
Analysis of GP characteristics shows that having other paid activities next to having a job as a GP does not, as hypothesized, lead to less community orientation. Rather, the relationship seems to be the other way around: GPs who have other paid activities next to their job as a GP are actually *more* community oriented than GPs who do not have other paid activities. This might be due to the types of 'other paid activities' which were included in the QUALICOPC questionnaire: being a private physician, working in a residential setting, as a company doctor or giving medical education. It is possible that because of working with different subcommunities of patients or students, GP participation in different

subcommunities is increased, which adds to their overall community participation and therefore increases GPs community orientation.

GP gender and age do not have a relationship with community orientation. However, gender did seem to have a relationship with external orientation in models 2 to 4, before urbanity and proportion of socially disadvantaged and ethnic minority patients were added to the model. This may indicate a slight negative relationship with external orientation for female GPs, which might be interesting for further research.

The relationship of practice characteristics with GPs community orientation
Strictly speaking, countries are no completely independent observations. First of all, 31 of the countries in the QUALICOPC dataset are nested within the European Union, which means they are influenced by EU vision and supranational policy in a greater sense, while Australia, Canada and New Zealand are not.

Secondly, countries who are near to each other may be of influence to each others health care policy because of copying behaviour. It is advised that future research controls for spatial autocorrelations, to account for similarities due to geographical nearness.

Lastly, countries differ in their primary care structure. In some countries, GPs are not the only health care professionals who offer primary care. This may affect generalizability of this paper's results for those countries.

Preventive care is positively related to GPs external orientation as was expected. However, statistical analysis cannot indicate causal relationships. Therefore, it may be the case that the relationship between preventive care and external orientation is significant because externally orientation influences preventive practice, instead of the other way around, as hypothesized.

It is advised that future research explores the relationship between preventive practice and community orientation further by measuring whether GPs take part in community oriented preventive *projects*, instead of performing preventive operations (such as measuring blood pressure and cholesterol) and giving preventive education, as the concept of 'preventive practice' was measured in this paper.

Furthermore, the practice level finding that practicing in rural areas has a significant relationship with GPs external orientation makes intuitive sense: in rural areas communities are smaller and therefore GPs are more likely to know members of (sub)communities and have a comprehensive idea of community (health) problems. Additionally, the sense of community and social cohesion in rural areas is greater than in urban areas, which might make it easier for GPs to implement community oriented projects if they wish to do so.

Furthermore, interdisciplinary collaboration is positively related to GPs external orientation. This might be due to the fact that interdisciplinary collaboration necessarily increases GPs scope of knowledge and sense of community. One could easily imagine that GPs, by collaborating with other professionals, gain information (medical as well as information about communities) which they would otherwise not have, and visit (health) facilities which they would otherwise not have visited, increasing their sensitivity to communities.

Furthermore, findings indicate that if GPs perceive the proportion of ethnic minority patients to be below average, they are less externally oriented. This might be due to less feelings of *need* to be very aware of (sub)communities if communities are perceived as relatively homogeneous.

Additionally, payment and employment systems, using medical records to generate community health records, receiving financial incentives for preventive care, perceived proportion of socially disadvantaged patient population and working in shared accommodation do not seem to have a significant relationship with GPs external orientation. This may be due to how concepts are operationalized in this research. For instance: proportion of socially disadvantaged and ethnic minority patients have been measured as perceived by GPs. This might have given a distorted image of actual numbers of socially disadvantaged and ethnic minority patients, since it has been indicated by previous research that these groups have lower access to healthcare (see, for instance: Kirby & Kaneda, 2005; Nielsen & Krasnik, 2010), and are therefore less likely to visit a GP practice and be visible to GPs.

Lastly, it is advised that future research into COPC includes variables about the amount of hours that GPs work and GP community training. Amount of working hours may, for instance, influence community orientation in the sense that GPs who are overwhelmed by work simply have no time to set up community oriented projects. GP community training is expected to have a positive relationship with community orientation, because if GPs receive training they are more equipped to practice COPC.

The relationship of country characteristics with GPs community orientation

Using a patient list system has a strong relationship with GPs community orientation. This is most likely due to the fact that having a patient list system helps GPs to define their practice community. However, patient list systems are no perfect measure of 'patient community' since not all community members are registered with a GP office (in their neighbourhood). Nevertheless, using a patient list system seems to set a condition for GPs community orientation.

The other significant country level relationship with GPs external orientation - transitional healthcare systems - may be associated with the former Soviet healthcare systems still being in development towards becoming a social insurance or national health system, as mentioned in the discussion of distribution results.

Political composition, GDP and primary care structure did not have a significant relationship with GPs external orientation. In the case of political composition, this contrasts previous findings (see, for instance Tenbensel, Eagle & Aston, 2012) and may be due to the fact that there was no data regarding political composition was missing for three countries in the dataset, or the fact that political 'left' and 'right' do not exactly refer to the same concepts across countries.

6 Advice for policymakers

6.1 Stakeholder analysis

In order to come to policy advice for the advancement of community oriented primary care, it must first be known which stakeholders have a say or interest in community oriented primary care (policy).

In previous chapters the World Health Organisation (WHO), European Commission and European Forum for Primary Care (EFPC) have been mentioned as the most important stakeholding actors regarding community oriented primary care. Additional stakeholders regarding COPC policy consist of the worldwide scientific community, national governments, primary care professionals and patient(s) (communities). All stakeholders are discussed below. A comprehensive stakeholder overview can be found in Appendix D.

World Health Organisation
The WHO is a subsidiary of the United Nations, comprised of member states of the United Nations. It is financed by contributions from member states and outside donors (WHO, 2012). Its main task is to direct and coordinate international health within the United Nations system (WHO, 2017b).

The organisation has the legal power to negotiate agreements, conventions and regulations, but rarely uses this 'hard' form of power. Instead, it principally displays its normative authority through the exercise of 'soft' power in the form of constitutionally authorized recommendations, influencing global rules and norms and monitoring compliance (Gostin, Sridhar & Hougendobler, 2015).

The WHO is positively interested in COPC, as it has expressed itself in favour of community oriented 'people-centred' care in the 2008 World Health Report (WHO, 2008), and lays emphasis on the importance of community based health services and community health interventions for universal health coverage in its 2013 World Health Report (WHO, 2013).

European Commision: Directorate General Santé
The European Commission (Directorate General Santé) is a subsidiary of the European Commission, and depends on national governments and healthcare professionals to execute policy. Its tasks are proposing legislation, implementing decisions, maintaining EU treaties and managing everyday business of the European Union (Europa.eu, 2007). The Directorate General Santé is responsible for (monitoring the implementation of) European policy on food safety and health (European Commission, n.d.), but has no formal power of influence on national governments. It does have, however, informal power of influence on national governments' health policy through the facilitation of meetings between Ministers of Health.

The European Commission has a possible interest in COPC, as it has expressed several objectives which COPC could possibly help realize (appendix D), such as 'cost

effective disease prevention' and 'effective, accessible and resilient healthcare systems'. Additionally, the European Commission has been advised to implement incentives for COPC by members of the scientific community (Kringos et al., 2015).

European Forum for Primary Care
The European Forum for Primary Care's Alliance for Community Oriented Primary Care services (ACOPCs) is a working group founded with the goal of stimulating the advocacy for and development of new national and regional associations of COPC services in Europe (EFPC, 2017a) and is thus per definition a positively oriented stakeholder regarding COPC developments. It is funded by EFPC's institutional and individual members (EFPC, 2017b.).

Scientific community
The scientific community is predominantly positive towards COPC, although this orientation is based on still a relatively small amount of research evidence on the benefit of the method. Recommendations have been given to implement European incentives for the method (see, for instance: Kringos et al., 2015) and commissions such as the EFPC's ACOPCs have been founded by members of the scientific commision with the aim to promote COPC.

National governments
National governments are stakeholders of COPC in the sense that they have expressed favourable interest in 'people-centred', community based care when they signed the WHO's declaration of Alma Ata in 1978. COPC could help strengthen their respective primary care systems, if they choose to implement it.

Primary care professionals and patient(s) (communities)
The descriptive results of this paper show how community orientation is distributed over (mostly European) GPs. However, it is not known what patients think of COPC.
Professionals and patient(s) communities are affected by COPC policy, as it alters their daily jobs and lives. Primary care professionals are required to alter their working methods and patients are expected to participate actively in local healthcare and prevention projects.

6.2   Substantive complexity

Substantive complexity "occurs when actors involved in policy making, policy implementation, or public service delivery experience difficulties in understanding the nature of the problem. Also, uncertainty or disagreement on the status of information, expertise, and evidence may make it hard to grasp what the problem is about" (Klijn & Koppenjan, 2015: p. 40). This form of complexity may arise in governance networks because different stakeholders have different perceptions of policy problems or concepts. Therefore, they interpret available information differently, which may lead to substantive uncertainty, which

in turn slows down the process towards a desired state of aligned perceptions (Koppenjan & Klijn, 2004).

Substantive complexity is relevant to COPC because there is disagreement of the effectiveness of community oriented practice on population health within the scientific community. Most scientific research considers community orientation one of the key features of good primary health care (see, for instance: Frenk, 2009; Gillam, 2008; Pavlič et al., 2015; Starfield, 1998), whereas some researchers argue that there is no evidence for effectiveness of COPC strategies (see, for instance: Gavagan, 2008; Williams, 2004).

To prevent COPC from being subject to a scientific knowledge conflict, it is advised that multi-organisational, international scientific research into COPC is commissioned by the WHO and Directorate General Santé, as they are objective bodies with regard to the scientific debate on COPC. Furthermore, it is advised that research is carried out by researchers from multi-organisational and -national backgrounds, to prevent one specific 'side' (either researchers who are convinced COPC is effective or researchers who believe there is no evidence for effectiveness) from prevailing over the other.

> *Policy recommendation 1: It is advised the WHO and Directorate General Santé fund multi-organisational, international research into COPC, focusing on the benefits for communities served*

Furthermore, substantive complexity is relevant to COPC policy because different stakeholders denominate community directed forms of primary care in different terms: the scientific community prefers to speak of community oriented primary care or COPC, whereas the World Health Organisation speaks about 'people-centred' care. At first glance, these two concepts seem hard to discern from one another. However, while both concepts emphasise a central role for communities in healthcare development processes, the two concepts differ distinctly in the sense that people-centred care is a conceptual framework whereas COPC is an applied method. 'People-centred care' may be seen as an umbrella term which encloses COPC as a practical *method*, through which people-centred healthcare can be realized.

Nevertheless, stakeholders will have to come to a joint consensus about the terminology of community oriented healthcare concepts themselves in order to arrive at an effective COPC policy and implementation strategy. Therefore, it is advised they confer about their respective perceptions.

> *Policy recommendation 2: Representatives of the WHO, Directorate General Santé, scientific community, ACOPCs, national governments and professional GP associations are advised to confer with each other about their perceptions on COPC and reflect on their own perceptions to identify overlaps, compatibilities and joint interests, in order to arrive at a joint consensus on the concept of community oriented care*

It has to be taken into account, however, that the European Commission has the most influence in debates with these stakeholders, since they have power of influence over national governments through the facilitation of meetings with national Ministers of Health. This asymmetry of perceived power can be curbed through emphasizing goal intertwinement (Klijn & Koppenjan, 2015: chapter 6). All stakeholders aim to promote community health; there is thus no reason to expect stakeholders to have different goals, however they might define them differently. This is expected to facilitate some form of trust between stakeholders.

Policy recommendations based on results of multilevel analysis
Multilevel analysis has indicated that, at a country level, having a patient list system has a positive relationship with community orientation and transitional healthcare systems have a negative relationship with GPs community orientation. Since countries with transitional healthcare systems are already in the process of transforming themselves into national health- or social insurance systems, there will be no policy advice given regarding health systems.

Regarding patient list systems, previous advice has already been given by De Maeseneer and Derese (1998: p. 50), who argued that "the introduction of a patient list in all European countries by the year 2000 is an essential condition for the further development of a community oriented general practice.". This paper adds policy advice on the question as to how patient list systems could be introduced nationally: it is argued the Directorate General Santé can use its informal power of influence to try and convince national governments to implement a nationally enforced patient list system. Furthermore, the WHO can exercise its 'soft' power of constitutionally authorized recommendations to strengthen the recommendations of the Directorate General Santé.

> *Policy recommendation 3: The Directorate General Santé and WHO are advised to jointly recommend national governments to work towards implementing a nationally enforced patient list system. It is advised they use the Directorate General Santé's informal power of influence to facilitate an assembly of Ministers of Health, to address the importance of patient list systems for community oriented practice*

Regarding GP- and practice level results, this paper findings are that having other paid activities next to having a job as a GP, preventive practice, interdisciplinary collaboration, urbanity and GPs perception of ethnic minority patient proportion are related to GPs community orientation. Since this research cannot conclude exactly why urbanity, having other paid activities and GPs perception of ethnic minority patient proportion are related to GPs community orientation, policy advice will focus on preventive practice and interdisciplinary collaboration.

It is advised that national professional GP associations from different countries organise themselves in an international union, led by one coordinating, international, professional GP association such as the Royal College of General Practitioners or the European Union of General Practitioners. Together, professional GP organisations may try to

devise a joint strategy to approach other professional organizations, in order to facilitate interdisciplinary collaboration between GPs and other health professionals.

Additionally, the same network of international professional GP organisations is advised to confer about a strategy to implement more preventive care (projects) into regular practice. For both interdisciplinary collaboration and preventive care (projects) it is recommended that the union as a whole tries to align perceptions within itself on what is desirable, before they spread out in smaller working groups to confer about what might (not) be effective in their respective health systems.

> *Policy recommendation 4: National professional GP organisations are advised to organise themselves into an international union. Representatives of all members from this union are advised to confer about strategies to facilitate interdisciplinary collaboration and preventive care (projects), before smaller working groups are put into place to confer about what might (not) be effective in national health systems.*

7   Literature

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Appendix A: Search strategy

A systematic literature search was performed using google Scholar and the online databases Cochrane Library, BASE (Bielefeld Academic Search Engine), PubMed-, Sociological Abstract, and the Worldcat database . The databases were searched for papers which contained any of the searchterm in table 10. Some of the search terms were derived from Gavagan's (2008) literature review, as well as the database Cochrane Library. Search terms and databases about COPC education were not adopted in the search strategy of this paper, as including a comprehensive review of COPC education goes beyond the scope of this research.

The idea behind using search terms of Gavagan's review is that all papers Gavagan used in his review should be found. Additionally, any new papers - that have been written after Gavagan's review from 2008 - should come up as well.

A search on the internet for 'grey' literature was conducted as well, with the searchterms 'COPC', 'community oriented primary care', 'community orientation' and 'community oriented'.

Table 10: Search terms

Community oriented primary care

Community orientation

COPC

Kark (in combination with COPC, community orientation, community oriented, community oriented primary care)

country (in combination with COPC, community orientation, community oriented, community oriented primary care)

country Europe (in combination with COPC, community orientation, community oriented, community oriented primary care)

Europe country comparison (in combination with COPC, community orientation, community oriented, community oriented primary care)

country comparison (in combination with COPC, community orientation, community oriented, community oriented primary care)

review (in combination with COPC, community oriented primary care)

systematic review (in combination with COPC, community oriented primary care)

community health*

community health planning*

community health services*

community health centers*

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* results for these search terms had to have relevant content concerning COPC in order to be considered

Appendix B: Data tables

Table 11: Type of healthcare system per country

Country	Type of healthcare system (2010)
Australia	NHS
Austria	SHI
Belgium	SHI
Bulgaria	TRANS
Canada	SHI
Cyprus	NHS
Czech Republic	TRANS
Denmark	NHS
Estonia	TRANS
Finland	NHS
Germany	SHI
Greece	NHS
Hungary	TRANS
Iceland	NHS
Ireland	NHS
Italy	NHS
Latvia	TRANS
Lithuania	TRANS
Luxembourg	SHI
FYR Macedonia	SHI
Malta	NHS
Netherlands	SHI

New Zealand	NHS
Norway	NHS
Poland	TRANS
Portugal	NHS
Romania	TRANS
Slovakia	TRANS
Slovenia	TRANS
Spain	NHS
Sweden	NHS
Switzerland	SHI
Turkey	SHI
United Kingdom (England only)	NHS

Source: European Observatory on Health Systems and Policies, 2006a; 2006c; 2011; Mossialos & Wenzl, 2016

Table 12: Left-wing dominance per country, 1960-2014

Country	Left-wing dominance in %*	Country	Left-wing dominance in %*
Australia	40	Lithuania	15.5
Austria	26.4	Luxembourg	11.8
Belgium	35.9	FYR Macedonia	-
Bulgaria	10.9	Malta	3.6
Canada	0	Netherlands	11.4
Cyprus	8.2	New Zealand	16.4
Czech Republic	11.4	Norway	18.6
Denmark	11.4	Poland	12.7
Estonia	8.6	Portugal	14.1
Finland	12.7	Romania	12.3
Germany	16.4	Slovakia	10.5
Greece	21.4	Slovenia	12.3
Hungary	18.2	Spain	18.2
Iceland	6.4	Sweden	21.8
Ireland	5.9	Switzerland	8.2
Italy	8.2	Turkey	-
Latvia	9.6	United Kingdom	23.6

* weighted by number of days government was in office
source: Armingeon et al, Comparative Political Data Set III 1990-2010

Table 13: Patient list system, per country

Country	GP use of patient list system	Country	GP use of patient list system
Australia	N	Lithuania	Y
Austria	N	Luxembourg	N
Belgium	N	FYR Macedonia	Y
Bulgaria	Y	Malta	N
Canada	N	Netherlands	Y
Cyprus	N	New Zealand	Y*
Czech Republic	Y	Norway	Y
Denmark	Y	Poland	Y
Estonia	Y	Portugal	Y
Finland	Y	Romania	Y
Germany	N	Slovakia	Y
Greece	Y	Slovenia	Y
Hungary	Y	Spain	Y
Iceland	Y	Sweden	N
Ireland	N	Switzerland	N
Italy	Y	Turkey	Y
Latvia	Y	United Kingdom (England only)	Y

Sources: Kringos et al, 2015a: chapter 3; College of Physicians and Surgeons of British Columbia, 2004; European Observatory on Health Systems and Policies, 2017; Gauld, n.d.; McCartney, n.d.; Medical Board of Australia, n.d.; Medical Council of New Zealand, 2008; Olson, 2006: chapter 4

* In New Zealand having a patient list system is not mandatory, but it is a prerequisite for GPs to be eligible for government subsidies

Table 14: Economic resources in gross domestic product, per country

Country	GDP x million ($) in 2015	Country	GDP x million ($) in 2015
Australia	1.339.140,53	Lithuania	41.170,73
Austria	376.950,25	Luxembourg	57.793,61
Belgium	455.085,73	FYR Macedonia	10.086,02
Bulgaria	50.199,12	Malta	9.746,48
Canada	1.550.536,52	Netherlands	750.283,91
Cyprus	19.559,94	New Zealand	173.754,08
Czech Republic	185.156,36	Norway	386.578,44
Denmark	295.091,33	Poland	477.066,45
Estonia	22.459,44	Portugal	198.923,26
Finland	231.949,65	Romania	177.954,49
Germany	3.363.446,82	Slovakia	87.263,62
Greece	194.851,32	Slovenia	42.774,77
Hungary	121.715,20	Spain	1.199.057,34
Iceland	16.598,49	Sweden	495.623,70
Ireland	283.703,22	Switzerland	670.789,93
Italy	1.821.496,96	Turkey	717.879,79
Latvia	27.002,83	United Kingdom (England only)	2.858.003,09

sources: European Commission (2016a), The World Bank (2016a; 2016b), OECD (2007; 2009), World Health Organisation (2016)

Table 15: Strength of primary care structure, per country

Country	Strength of PC structure*	Country	Strength of PC structure*
Australia	**2.51**	Lithuania	2.27
Austria	2.22	Luxembourg	1.90
Belgium	2.21	FYR Macedonia	**2.37**
Bulgaria	2.14	Malta	2.12
Canada	**2.34**	Netherlands	2.50
Cyprus	1.91	New Zealand	**2.36**
Czech Republic	2.14	Norway	2.27
Denmark	2.38	Poland	2.12
Estonia	2.29	Portugal	2.41
Finland	2.31	Romania	2.31
Germany	2.20	Slovakia	2.02
Greece	2.10	Slovenia	2.36
Hungary	2.08	Spain	2.43
Iceland	1.77	Sweden	2.23
Ireland	2.20	Switzerland	2.04
Italy	2.33	Turkey	2.27
Latvia	2.14	United Kingdom (England only)	2.52

*Range of scale 1-3 (low primary care orientation - high primary care orientation)
source: Kringos, 2012: chapter 7, p. 200; Schäfer, 2016: appendix 4, p. 186

Appendix C: Results

Table 16: Multilevel regression results of the interrelation between GP- and practice characteristics and GP external orientation - all models

	M0	M1	M2	M3
	B (SE)	B (SE)	B (SE)	B (SE)
y = external orientation				
Fixed coefficients				
constant	9.611(.116)***	9.624(.120)***	9.610(.162)***	8.675(.206)***
level: GP				
female (ref =male)		-.157(.050)**	-.150(.050)**	-.149(.051)**
other paid activities		.199(.057)***	.168(.058)**	.188(.058)***
age (centred around mean)		-.044(.035)	-.049(.035)	-.061(.035)
level: practice				
self-employed (ref = salaried)			.142(.081)	.126(.082)
payment system (ref = ffs)				
- salary			-.198(.110)	-.168(.110)
- capitation			-.031(.133)	-.020(.133)
- out of pocket, perf. pay + other			-.026(.095)	-.022(.095)
medical records				.021(.057)
routine preventive work				
- blood pressure + cholesterol				.186(.035)***
- preventive education				.204(.033)***
Financial incentive for preventive work (ref = no)				.020(.061)
interdisciplinary meeting				
interdisciplinary advice				
urbanity				
soc. disadvantaged				
ethn. minorities				
shared accommodation (ref = solo)				
Random coefficients				
level: country				
variance	.438(.112)**	.418(.108)**	.434(.111)**	.456(.116)**
level: practice				
variance	3.912(.064)***	3.900(.065)***	3.891(.064)***	3.810(.064)***
total variance	4.350	4.317	4.325	4.266
N: country	34	34	34	34
N: practice	7414	7336	7336	7162
ICC	.101	.097	.100	.107
-2*loglikelihood	31259.46	30907.70	30892.18	30011.77
change in -2LL(df)	-	-351.76(3)***	-15.52(4)***	-880.41(4)***

*** p < 0.001; ** p < 0,05

	M3	M4	M5
	B (SE)	B (SE)	B (SE)
y = external orientation			
Fixed coefficients			
constant	8.675(.206)***	8.210(.211)***	8.170(.222)***
level: GP			
female (ref =male)	-.149(.051)**	-.133(.050)**	-.112(.050)
other paid activities	.188(.058)***	.141(.058)**	.162(.058)**
age (centred around mean)	-.061(.035)	-.052(.035)	-.052(.035)
level: practice			
self-employed (ref = salaried)	.126(.082)	.136(.081)	.132(.081)
payment system (ref = ffs)			
- salary	-.168(.110)	-.179(.109)	-.163(.109)
- capitation	-.020(.133)	-.016(.132)	-.002(.109)
- out of pocket, perf. pay + other	-.022(.095)	-.046(.095)	-.044(.094)
medical records (ref = no medical record use)	.021(.057)	-.013(.056)	.004(.056)
routine preventive work			
- blood pressure + cholesterol	.186(.035)***	.165(.035)***	.171(.035)***
- preventive education	.204(.033)***	.190(.032)***	.190(.032)***
Financial incentive for preventive work (ref = no)	.020(.061)	.005(.060)	.010(.060)
interdisciplinary meeting		.055(.011)***	.051(.012)***
interdisciplinary advice		.054(.009)***	.053(.009)***
urbanity (ref = big (inner) city)			
- suburbs			-.021(.081)
- (small) town			.127(.067)
- mixed urban-rural			.172(.074)**
- rural			.411(.075)***
soc. disadvantaged (ref = average)			
- below average			.084(.058)
- above average			.078(.065)
ethn. minorities (ref = average)			
- below average			-.145(.059)**
- above average			.069(.078)
shared accommodation (ref = solo)			-.089(.256)
Random coefficients			
level: country			
variance	.456(.116)**	.455(.116)**	.468(.119)**
level: practice			
variance	3.810(.064)***	3.761(.063)***	3.734(.063)***
total variance	4.266	4.216	4.202
N: country	34	34	34
N: practice	7162	7162	7162
ICC	.107	.108	.112

-2*loglikelihood	30011.77	29919.54	29870.02
change in -2LL(df)	-880.41(4)***	-92.93(2)***	-49.52(9)***

*** p < 0.001; ** p < 0,05

Appendix D: Actor analysis

Table 17: Stakeholder analysis

Actor	Task(s)	Perception (on COPC)	Position and dependencies
World Health Organisation	To direct and coordinate international health within the United Nations' system (WHO, 2017b)	The promotion and protection of health of all peoples is aided by 'people-centred care', in which family and community play a crucial role (WHO, 2017d)	Subsidiary of the United Nations; comprised of member states; financed by contributions from member states and outside donors (WHO, 2012); normative authority, "mostly exercised through 'soft power' - either constitutionally authorized 'recommendations' or more informal action (...), rarely exerts its constitutional authority to exercise 'hard' power by negotiating binding international law" (Gostin, Sridhar & Hougendobler, 2015: p. 2)
European Commission: Directorate General Santé	The European Commission is responsible for proposing legislation, implementing decisions, maintaining EU treaties and managing everyday business of the European Union (Europa.eu, 2007). The Directorate General Santé is responsible for (monitoring the implementation of) European policy on food safety and health (European Commission, n.d.)	Objectives regarding healthcare: a) cost effective health promotion and disease prevention; b) effective, accessible and resilient healthcare systems in the EU, c) increased access to medical expertise and information for specific conditions (European Commission, 2016b), no special mention of COPC	Subsidiary of the European Commission; dependent on national governments and healthcare professionals to execute policy; has been advised by scientific community to implement incentives for community oriented primary care (Kringos et al., 2015). No direct influence on national governments, but indirect through organised meetings between Ministers of Health from national governments
Scientific community	Healthcare research	Differing per research institute and researcher,	Dependent on organizations (for

		predominantly positive towards COPC	instance WHO and the European Commission) for funding of research projects
Alliance for Community Oriented Primary Care services (ACOPCs)	Main objectives are "to strengthen the lobby for COPC at regional, national and European level" and "to stimulate the development of new national/ regional associations of COPC services in Europe" (EFPC, 2017a)	COPC needs to be stimulated in the European context	Subsidiary of the European Forum for Primary Care, therefore funded by EFPC's institutional and individual members (EFPC, 2017b)
National governments	Providing citizens with sufficient accessible, quality healthcare	Differing	Most countries in this paper are required to follow European law (except for Australia, Canada and New Zealand), influenced by the WHO (for instance the declaration of Alma Ata, signed by all countries in this paper (WHO, 2017a)); dependent on healthcare professionals to execute healthcare policy
Primary care professionals (including general practitioners)	Delivering quality healthcare to patients	Differing	In some cases dependent on national government or national organisations for salary, in all cases constricted by national and European law and policies
General practitioner patients and patient communities	Participating in community oriented care initiatives	Differing	Dependent upon primary care professionals, healthcare institutions and national government for the provision of healthcare