Learning from promising primary care practice models for the USA

Framework for analysis of primary care contexts, systems and services

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Executive summary

The project 'Learning from promising primary care practice models for the USA' seeks to identify and describe promising primary care (PC) practice models in middle- and high-income countries. These should have relevance to and can inform policy and practitioner dialogue on models and measures to be adapted or adopted in the US to produce the widest, most sustained and equitable health gain for resources applied.

This paper presents a conceptual and analytic framework used to organise and analyse evidence on the contexts for, determinants and dimensions of promising PC systems and models in upper middle- and high-income countries that can inform US policy and practice. The conceptual framework was revisited at various stages of the work. A first iteration was used to organise evidence from desk reviews of (i) the challenges to PC services in the US and of (ii) promising practices from middle- and high-income countries and to carry out a comparative analysis of country data on health systems and their outcomes evidence. Information identified in these reviews was integrated into the framework.

We drew on available international literature on frameworks for evaluating PC systems and on a wider literature on health systems, their contexts and determinants, with 44 papers included from a search of published literature using relevant key words. Many frameworks for analysing PC practice did not share the same purpose as our study, so we drew further evidence from the desk reviews.

Noting the different ways different countries conceptualise their primary care systems, we do not provide a rigid definition of PC, but rather present common attributes of primary care found across many settings. We also situate PC within the broader context of primary health care.

The framework is shown in *Figure 1* on page 11. The conceptual and analytic framework covers five key domains. It includes more specific constructs within these five domains, and the elements of these constructs:

1. The first domain is that of the **structural contexts** for and structural determinants of PC systems, firstly in terms of the socio-political, economic and health context and. secondly, in terms of the policies, laws, governance, organisation, resources and financing of the health system.

2. The second domain covers the **PC system** itself and its inputs, what it covers, and the processes and features of the PC services.

3. The third domain looks at the **social roles** in health systems. It does so in relation to the nature of the **social interaction** between personal care and population health services and their clients, and their families and communities, addressing the diversity of communities and individuals in society, and the **social features within the community** that affect the relations with the PC system (as distinct to the wider sociopolitical features in the context).

4. The fourth domain includes the **outcomes** of the health and particularly the PC system (noting the difficulties with attribution), in terms of service outcomes such as acceptability and health service coverage; and health status outcomes generally and between different population groups.

5. The fifth domain – **managing and sustaining change** – is important for the focus of this project. It includes constructs that help to understand how change is introduced, managed, sustained (and resisted!) in PC systems, from national to local levels.

The paper presents a map of domains, constructs and elements, within our understanding of PC (and health systems) as complex adaptive systems that are dynamic. The framework draws attention to elements of the PC system, to support follow-up work on exploring the features of PC systems and selected middle- and high-income countries.

We give weight to particular constructs and elements within the framework because of their importance for the focus of the project and the frequency with which they are cited as important in the literature. The evidence from the synthesis of the literature reviews further highlighted components of

the system and relationships that had greater importance for this project.

There may be important interrelations among components within domains. For example, the manner of enrolment or registration of clients with a PC practice has implications for how the PC system plays a role as gatekeeper in referral, in follow up for prevention or chronic care or the options for payment for services.

There are also important links across domains. For example, the organisation of the wider health system in Domain 1 provides an influential context for what takes place in more specific domains of PC practice. Not only does this context need to be understood, but so do the changes taking place within it, including in relation to the roles played by the different private and public actors in influencing that change.

This framework is now being applied within the programme on 'Learning from promising primary care practice models.' The deeper analysis from the country work and the comparative review across countries will further enrich the framework. It will contribute evidence on and analysis of the PC service inputs, the service content and processes and the interface between PC and the society that support

positive health outcomes, and the factors that enable or block these approaches to PC, within the context of specific health systems and socio-political and economic systems. It will also strengthen understanding of the organisational arrangements, systems, competencies, skills and processes that support and sustain PC reforms.

The framework has guided this review and analysis. The evidence gathered is being used to further develop, deepen and strengthen our understanding of:

- those constructs and areas of content that appear to have most significance in understanding how PC systems produce widest, most sustained and equitable health gain for resources applied;

- the linkages between domains and constructs that are associated with improved services features and health outcomes (immediate, ultimate and in terms of equity); and

- plausible pathways connecting specific contexts, constructs or elements within and across domains where PC models and practices are associated with improved outcomes.

1. Introduction

Primary care (PC) services are generally understood to include first contact accessible health care services that address the main physical, mental and social health concerns, through a sustained partnership between patients and a team of health workers in a family and community context (see more detailed discussion in *Section 3*). Key features include first contact and accessible care, continuity of care, integrated care for multiple health needs and coherent links with community/public health and secondary care (Kruk et al., 2010). Primary care is a core component of the primary health care approach that puts people at the centre of service delivery, through measures for population health, prevention and care according to need and involving population groups in decisions and actions on their health (Loewenson and Whitehead, 2012; WHO, 2013). As an entry point, effective primary care guides patients through the health system, ensuring effective referral to other levels and supporting services (Loewenson and Whitehead, 2012; Molla et al., 1996). It is delivered through multidisciplinary teams of doctors, nurses and other health professionals in collaboration with lay workers such as information and administrative personnel, volunteers and community health workers (CHWs) (Kruk et al., 2010; WHO, 2013) (see details in sections 3 and 4).

Investment in primary care, and particularly health promotion and appropriate prevention services, has been found to contain health care costs over the long term, improve value for money, healthcare access and outcomes (Loewenson and Whitehead, 2012; Macinko et al., 2003), although it may call for higher investments to strengthen PC systems (Delnoij et al., 2000; Kringos et al., 2013). Strengthened PC services can reduce unnecessary hospitalisation and improve management of co-morbidities as well as continuity and co-ordination of care in and beyond the health system (Cheng and Solomon, 2013; Macinko et al., 2003). Investments in PC services have been observed to improve patient, family and community involvement and health literacy, to leverage action on social determinants of health, to build cross links between personal health care and public health and to strengthen local economic activities and employment from the health sector (Loewenson and Whitehead, 2012; RWJF, 2009; WHO, 2013).

Even where health gains are found, challenges to delivery of high-quality PC services are also noted. Some of these arise within the wider socioeconomic and health system. Health systems are key determinants of health outcomes across social groups. They can provide protection against impoverishing effects of ill health. They may, however, in their organisation fail to support PC and increase socioeconomic inequalities in health status. They do this when they: focus on individual curative care at the expense of health promotion and/or prevention of disease; have only limited opportunities for engagement with communities; fail to support services or interventions needed by marginalised groups; or to provide financial protection for low-income groups (Gilson et al., 2008; Loewenson and Whitehead, 2012). PC systems may themselves face challenges, including: poor longitudinal continuity, weaknesses in community orientation, workforce shortages and orientation, and inadequate evaluation of PC initiatives (Kruk et al., 2010; Macinko et al., 2003; McDonald et al., 2006).

It is not always possible to attribute positive health outcomes and cost benefits directly to primary care. The evidence may not be available and there may be concurrent changes in the wider system that positively or negatively influence outcomes (Kringos et al., 2010; McDonald et al., 2006). This makes it necessary to understand the socioeconomic context, the wider health system factors and the models, processes and service features of PC systems that influence positive outcomes.

1.1 The overall project

Strengthening the PC system is increasingly recognised as important in the United States, where PC innovations are being applied in US health reforms. The 2010 Patient Protection and Affordable Care Act (P.L.111-148) (PPACA) included a stated aim of improving the health benefit from spending, especially for underserved populations (Gruber,

2010). Support of PC services and the PC workforce are elements of this reform.

The Training and Research Support Centre (TARSC) in association with Robert Wood Johnson Foundation (RWJF) has in 2014 implemented work that aims to identify and describe promising primary care (PC) practice models and approaches from international experience in high and middle income countries. It has explored learning from countries achieving better health outcomes at lower costs than in the US, and on areas of PC practice that have relevance to the challenges faced in PC practice in the US, through:

i. Analysis of indicators from international databases of health spending and health outcomes in middle- and high-income countries;

ii. Desk reviews of challenges to and promising practices in strengthening PC services in the US; and of features of PC systems in middle- and high-income countries associated with improved health outcomes, and the contexts and factors that support them;

iii. A cross-cutting review of the evidence gathered to identify areas for learning from PC models and systems in other countries that have relevance to the US;

iv. Country case studies from selected countries to draw deeper understanding of these PC models, their contexts and their implementation; and

v. Analysis across the combined body of evidence to identify areas of promising practice for policy and institutional dialogue on model adaptation in the USA.

The project did not seek to make the case for or to evaluate PC models in aggregate across countries. Rather, it sought to explore specific features of PC practice that have had positive impacts on health, with attention to the contexts, systems, features and processes that have relevance to the US context, and that may be adapted in the US, and also the organisational skills, processes and competencies needed for their development and implementation. This specific purpose is important to note in considering the framework outlined in this paper.

This paper outlines the framework used to gather evidence on promising features of PC systems and their contexts that have relevance to/match for US policy and practice. The framework provides a broad presentation of key domains and constructs that are relevant to analysing PC systems across contexts. It also provides a more detailed set of elements within those constructs that may have different relevance in different contexts.

The paper sets out the aims of the work on the framework, the methods used in developing it, the attributes of PC identified and used and the domains, constructs and content of the elements of the framework.

1.2 Aims of the work

The conceptual and analytic framework aims to cover key constructs, areas of evidence, and indicators for analysis of the role of PC systems in high- and middle-income countries to support the work in the project, for the analysis of international data, the desk reviews and the country case studies.

The framework drew on available international literature on frameworks that have been used to assess PC models and practice, the wider socioeconomic and health system contexts for PC practice, and the health outcomes from PC practice. A number of frameworks and models developed for review of PC practice have a different purpose to the aims of our work.

Most papers in the literature on PC frameworks/evaluative approaches aim to evaluate broadly the contribution of PC to improving health systems performance or to specific health outcomes, to make the case for PC by relating key features to health outcomes across countries. Many seek to develop a composite 'primary care score' for cross-country reviews, but these do not assist to identify the specific features of PC systems that support the positive outcomes found:

> *Although this is helpful in determining the overall contribution of primary care to population health, it does not provide specific policy advice as to which part of the primary care system a policymaker might want to improve to most effectively benefit population health. This is partly because the objective is to ascertain the overall impact of primary care systems on population health and not to discern the relative contribution of specific primary care features* (Macinko et al., 2003: 856).

Given the aims of this project we thus draw on these frameworks, and have included further domains relevant to the study purpose.

The definitions used for primary care, and the elements profiled vary across the different frameworks, countries and contexts, and have evolved in the past 20 years. As applied in middle- and high-income countries, PC has, for example, developed from a model delivered largely by general practitioners or family physicians to one of multidisciplinary teams delivering a wide range of promotive, preventive, curative, palliative and rehabilitative services in collaboration with other social services. We discuss this further in *Section 3*, and present attributes that were applied in elaborating the framework.

2. Methods

We implemented a comprehensive search of grey and published literature to identify frameworks, applications, and/or approaches to this issue.

2.1 The searches

The search for papers, described more fully below, was implemented by one author (SS), the set of papers identified was reviewed as abstracts both authors (SS and RL) and for selected papers as outlined below as full papers. Further papers were identified through web searches and the US peer reviewer (AN) provided further papers supporting review inputs. Both investigators identified further papers through snowballing from the reference lists. *Table A1* in *Appendix 1* gives further details on the methods and the source and basis for inclusion of the final set of papers included in the conceptual framework.

The criteria for inclusion was that the paper made specific reference to a framework, was focused on PC, and had information relevant to the assessment and understanding of PC and its contribution to improved health. We excluded papers that were earlier versions of an updated paper by the same authors already included, where the same concepts were already covered. We did not include papers that were evaluations of specific clinical interventions or of specific sites.

Forty-four papers were included in the final set. The framework was peer reviewed by external peer reviewers. The desk reviews, database and synthesis of evidence, separately reported (Nolen 2014, Simpson 2014; Loewenson 2014; Loewenson et al 2014) were used to validate the relevance of the framework and information added from these reviews where relevant to the framework.

2.2 The matrix and data capture

A matrix was developed to provide a structure for capturing evidence from the papers. The matrix included five key domains for analysis, as identified in the proposal for the project. Within these domains the matrix includes the main

constructs (or the factors within the domain), the more detailed content of those constructs, and the indicators used to measure these constructs or their proxies (see *Table 1*).

Table 1: Structure of the matrix

Domain- major area – e.g. context		
Category (grouping) of constructs –e.g. service inputs		
Construct Factor in the domain – e.g. workforce type and density	**Content** Key elements of the construct – e.g. type of PC personnel, links with specialists, etc	**Indicator** Measure of the construct or its proxy – e.g. PC workforce type/1000 population

While no further domains were added from the analysis of the papers selected for the framework, some additional constructs were raised in the papers and included. The specific content in any construct identified in a study was recorded with the study reference, even if it repeated the same content in another study.

This matrix was used to make final decisions on inclusion/exclusion of papers, and for those 44 papers included, to capture information relevant to the framework. An initial subset of 10 papers was used to capture data for the matrix by each of the two principle investigators separately. A comparison of the entries indicated low differences between the two tables. The data capture was then completed on the remaining papers. On the basis of their content, the constructs were either retained, collapsed or further disaggregated and categorised into groups or clusters within the domains. While cautious of publication bias, the frequency of inclusion of an element of the content in different sources (authors and countries) in the literature and the importance given to the indicator in PC practice was used to identify those content elements that had greater weighting in a construct.

Once the matrix was developed, the relationship between the domains and their constructs was reviewed for consistency with relationships indicated in the literature and wider health system literature (WHO 2000; WHO 2013; Gilson et al., 2008).

2.3 Limitations

We are aware of limitations in the methods and the materials sourced:

i.   **Limitations in inclusion of all literature:** We did not review all grey literature and may have omitted some key frameworks not found on the databases searched, such as from China, Latin America, Asia, although we did have review papers with frameworks applied in Brazil, Thailand, Korea, Australia, New Zealand, and other OECD countries in Europe and North America. We will continue to source further material. However, the work on the matrix suggested that we had reached saturation with limited new information not already in the matrix coming out from further papers. Thus, we suggest that the matrix includes the relevant information to support analysis for the next stage of work.

ii. **Limitations of the search strategy.** Due to time constraints the initial search was fairly limited in terms of key words and search terms used – using the headings of some of the main frameworks or approaches. This is consistent with other search strategy approaches where searches tested terms for their retrieval of known reports to gauge likely yield of references (Macinko et al., 2003). The intent was to identify any additional frameworks/evaluative approaches as well as different perspectives that might be useful in reframing the current approaches taken and in meeting the project brief. Given that papers sourced from additional websites largely verified existing information and added little further information, we consider the framework to be sufficiently robust to guide the review work at this stage.

iii. **Limitations with measurable evidence.** A number of papers identified data sources for measurement of PC indicators, particularly WHO and OECD databases, and the World Bank; in Europe the European Observatory on health care systems and policies; Eurostat and OECD system of health accounts; the OECD health equity project; the OECD health quality indicators; the profile of general practice in Europe and the primary health care activity monitor for Europe (PHAMEU) (Starfield, 1994; Macinko et al., 2003; Kringos et al., 2013). However, they also noted

that the indicators are not comparably defined in all countries. Further, many of the indicators proposed are not specific or reliable enough (Kelley and Hurst, 2006) or are of proxies, and many constructs lacked meaningful indicators, particularly those relating to important social dimensions of context and of PC systems. The studies of national systems and cross-country reviews cannot attribute health outcomes directly to PC services, nor to particular features of those services. This limitation affects efforts to use databases to identify countries achieving better health at lower cost. We are, however, aware of this limitation. This project for example triangulates evidence from data with that from literature review of PC practice.

iv. **Limitations with the scope of papers and analysis of the field.** We noted in *Section 1.2* that the available literature and known frameworks provided useful evidence but were generally developed for a different purpose, limiting application to our purposes. The papers report on areas of contribution of PC to better health outcomes in a context of ongoing changes in health systems. We found limited documentation of recent frameworks that are tracking the changes within and across the domains and constructs and how they affect each other as dynamic systems (de Savigny and Adam, 2009).

v.   **Limitations in whether publication reflects recent changes in PC systems.** With many reforms taking place in the US in the context of the Affordable Care Act, including around PC practice, and payment, service delivery, information and other innovations happening faster than formal publication, it is likely that new issues or elements emerging from reforms may not be captured in the domains. Similarly, changes are taking place in many health systems in Europe and Latin America that are more accessible from key informants than published literature. Hence, while the broad domains and constructs may capture the key areas for analysis, they may miss specific elements that are emerging from current reforms. This will be addressed through other methods, such as the more detailed country case studies.

3. Scope and attributes of primary care

We used the literature to identify the key attributes of primary care. There are many definitions of primary care. For example:

Primary care (PC) services include first contact integrated and accessible health care services that address the main physical, mental and social health concerns, through a sustained partnership between patients and a team of health workers in a family and community context. Key features include first contact and accessible care, continuity of care, integrated care for multiple health needs and coherent links with secondary care (Kruk et al., 2010).

Primary care is a core component of the primary health care approach that puts people at the centre of service delivery, through measures for population health, prevention and care according to need and involving population groups in decisions and actions on their health (WHO, 2013; Loewenson and Whitehead, 2012). As an entry point, primary care guides patients through the health system, ensuring effective referral to higher levels and other supporting services (Loewenson and Whitehead, 2012; Molla et al., 1996). It is delivered through multidisciplinary teams in collaboration with non-professional workers, including community health workers (CHWs) (Kruk et al., 2010; WHO, 2013).

The definitions found in the literature reviewed fell within three broad categories:

1. **Detailed definitions integrating attributes and outcomes.** For example, *primary health care can be defined through the domains (or attributes) of access to first contact, longitudinality, co-ordination, comprehensiveness, community orientation, and family orientation. These attributes, recognised as the structural bases of the primary care process, are associated with quality of services, patient satisfaction and health system effectiveness, efficiency and equity* (Harzheim et al., 2006: 156).

2. **Summary nature and purpose definitions** such as *primary care is the first level of professional care service, where people present their health problems, and where the majority of the population's curative and preventive health needs can be satisfied* (Kringos et al., 2013:742).

3. **Goal-oriented or aspirational definitions** such as *primary care practices that provide comprehensive and co-ordinated care confer the most benefits to patients. What characterises these practices is that they: have a sound knowledge of their patients and community; use clinical guidelines and provide evidence-based care; provide collaborative team-based care; use and share information through electronic medical records; and have effective patient flow processes* (McMurchy, 2009: 1).

In many definitions of PC, the 'people-centred' nature of services is raised as an important feature, including the role of the PC practice population and community in catchment areas to be meaningfully involved in planning, implementation and monitoring of services, and for services to be based on community and population social, economic and health profiles (Kates et al., 2012; McMurchy, 2009; Gilson et al., 2008).

PC is understood to be a core component of the primary health care (PHC) approach. PHC is understood as a strategy for organising health systems to promote health, and particularly providing a basis for the social and institutional action necessary to promote health among socially disadvantaged and marginalised populations (Gilson et al., 2008). As a core component of the primary health care approach it is argued to put people at the centre of service delivery, linking individual care to population health, delivering prevention and care according to need and involving population groups in decisions and actions on their health (WHO 2013; Loewenson and Whitehead, 2012).

The literature highlights the variation in how PC is understood. White and Marmor (2009) highlight from a

review of PC across four countries that the concept of what constitutes primary care differs across countries, with some vagueness in and local interpretation of the concept. They point out differences in the scope of what is considered 'primary', and an aspirational, normative content to what is understood to be PC. This view is shared by others:

> *Primary care" has different meanings in different countries. The providers of primary care may be general practitioners, family physicians, specialists working in the community, nurses or nurse practitioners and (perhaps) physician's assistants. These practitioners may work in solo practices or in large multi-professional groups and may or may not be integrated with social and community services....* (Lester and Roland, 2009: 371-2).

All the various definitions have relevance. Primary care is contextually bound and the attributes and terms used (such as team-based care) may be differently understood in different contexts. We therefore avoided seeking to reach a single definition of primary care. Given the project scope and objective, we aimed rather to outline the scope and attributes of PC that would support a shared understanding for the purposes of the project, whilst allowing for the diversity across countries, including in terminology used.

The common attributes of PC, found across different definitions and countries are summarised in *Box 1 below.*

Given its role as entry point to the health system, as combining promotion, prevention and care services and population and individual approaches, and given its potential connection to both social and technical dimensions of health systems, Lester and Roland (2009:374) note that:

> *Primary care is therefore the cornerstone of most health-care systems and measurement of its performance therefore plays a critical part in ensuring that the whole system works effectively, efficiently and for the benefit of most patients.*

Box 1: Common attributes of Primary care

Primary care includes:

1. first contact, accessible health care services, where demands are clarified and information, reassurance or advice are given, diagnoses made and where the majority of health issues should be resolved;

2. different practice sizes and different levels of integration with social and community services;

3. which address the population's main physical, mental and social health concerns, integrating their biomedical, psychological and social dimensions;

4. and respond to social, cultural, economic norms and contexts;

5. based on sound knowledge of their patients and community; and using population health and clinical guidelines and evidence;

6. in an integrated, co-ordinated, comprehensive approach to population health; health promotion, disease prevention, personal care and rehabilitation;

7. supporting continuity of care; guiding and supporting referral to other levels of the system and other supporting services, and engaging in intersectoral collaboration;

8. putting people at the centre of service delivery;

9. within a family and community orientation;

10. through a sustained partnership between people and patients and a multidisciplinary collaborative team of health workers, including community health workers (CHWs);

11. and supported by effective information use and sharing.

Kruk et al., 2010; WHO, 2013; Loewenson and Whitehead, 2012; Molla et al., 1996; Kringos et al., 2013; Harzheim et al., 2006; McMurchy, 2009; Lester and Roland, 2009; Kitreerawutiwong, 2010; Starfield et al 2005

4. A conceptual framework for the work

4.1 Analytic domains, constructs and categories

As outlined in the methods (*Section 2.2*) we developed an analytic framework for the specific purpose of the project that would enable us to capture key constructs, areas of evidence on PC systems from the US and middle- and high-income countries, particularly on the role of PC systems in improved health outcomes in these countries.

We applied inductively the evidence from the 44 papers included in the reference list in 6.1 and the frameworks outlined in those reviews to build our analytic framework for the specific purpose of this study. *Box 2* shows common frameworks and tools referred to in the literature. We did not use the specific tools listed in *Box 2*, but drew on them, their understanding of features and processes, of distal and proximal determinants, PC system inputs, attributes, functions and processes, and health outcomes to develop our framework and its content.

Box 2: Frameworks and tools identified in the literature

Harzheim et al. (2006):	Primary Care Assessment Tool (PCA Tool), used to evaluate quality of PC
Kates et al. (2012):	Health Quality Improvement Tool (Canada), used to guide the process of primary care transformation
Kates et al. (2012):	Institute for Health Improvement Triple Aim, used to assess impact of PC services
Kates et al. (2012):	Institute for Medicine committee on quality of health care in America 2008- used to improvement aims and assess quality
Kringos et al. (2013):	EU Primary Health Care Activity Monitor (PHAMEU) used to monitor PC performance across countries
Starfield, Shi, and Macinko, (2005):	Primary Care Assessment Tool (PCA Tool) used to ascertain the overall impact of PC systems on population health
Brennan et al. (2012):	Informing Quality Improvement Research (InQuIRe) used to capture factors relevant to evaluating CQI in primary care
Lester and Roland, 2009:	European Practice Assessment Practice Management (EPA-PM) framework- used to identify organisational issues in PC
Schafer et al. (2011):	The QUALICOPC (Quality and Costs of Primary Care in Europe) framework used to evaluate the performance of primary care systems in Europe in terms of quality, equity and costs
Saffran et al. (1998):	The Primary Care Assessment Survey (PCAS) tool, a patient-completed questionnaire used to assess seven domains of PC in the US

We have tried to reflect where feasible the language used in these analytic frameworks or tools to show where there is congruence, while noting that our purpose and thus framework is not the same.

Five key domains were selected to take this purpose into account, each for the reasons given below:

i.   **Context:** to locate the PC models and features within their specific structural contexts to support analysis of the potential for their adaptation to the US context, separating general socioeconomic contexts and specific health system contexts

ii. **PC service delivery:** to understand the dimensions of PC services contributing to various dimensions of improved health, particularly in the context of populations with higher chronic disease burdens and multiple and sometimes linked morbidities (multimorbidity).

iii. **Public/social roles:** to understand the interface between the PC system and the features and roles of communities, to locate the systems within the context of the culture, organisation and processes of communities within the US at local level in the interface with the PC system, and particularly those communities with high health needs.

iv. **Outcomes:** to assess the nature and direction of the health service and health status outcomes associated with different PC models and features, while noting difficulties with attribution and the impact of socioeconomic and health system contexts.

v.   **Managing and sustaining change:** to understand the organisational development, leadership competencies, skills and processes that play a role in PC to inform recommendations for adapting and sustaining models across different country contexts.

Within these domains the chart and matrix include the key constructs (or the factors within the domain). Given that they are drawn from literature from different countries and contexts, we would consider these broad categories to be robust across settings.

Figure 1 presents the analytic framework graphically, to give an overview of the key domains and constructs, their broad content and the relationships between domains and constructs.

Section 4.2 provides more detailed information in a matrix, with areas of content of the constructs as drawn from the papers and from the literature reviews. This is intended to guide the work and not to be an exhaustive checklist.

In *Appendix 2* we outline indicators cited in the literature reviewed for the framework to measure these constructs or their proxies, which were used as a guide in the database analysis.

In *Section 5* we discuss the framework and matrix and its limitations. We identify areas for further development, particularly in terms of analysis of the interaction and relationship between domains and constructs.

We give weight to particular constructs and elements within the framework because of their importance for the focus of the project and the frequency with which they are cited in the literature as key elements of PC systems. The evidence from the synthesis of the literature reviews will further highlight components of the system and relationships that have greater importance for this project.

The framework considers contextual factors at the *macro level*, in relation to the values, political economy, socio-demographic, cultural and other features that give rise to health and health systems, and in relation to the broader organisation of the health system. It presents PC systems at the *meso level*, as part of wider health systems. It focuses on PC inputs, services provided, organisation and processes, including the interface with society or the organisation of social and community roles that operate and may have impact beyond the local practice level. It also, however, notes the potential for diversity at the *micro level* and in local practice level interactions with individuals and communities, and thus the role of mechanisms that connect these local level features with the wider PC system.

Figure 1: Conceptual framework for analysis of the role of PC

DOMAIN 1: CONTEXT/ STRUCTURAL

NATIONAL CONTEXT values, demographic, sociocultural, political, economic, governance/institutional and health

HEATH SYSTEM CONTEXT-policy, universality, legal, governance, financing; public-private ownership, segmentation, workforce

DOMAIN 2: PC MODEL/PROCESS MODE OF PRACTICE/ SERVICE DELIVERY

SERVICE INPUTS

Infrastructure; workforce training, development, density, mix, organisation, competencies, autonomy, orientation, payment, incentives

Medicine management, pricing, payment

SERVICE CONTENT

Person centred first contact;

Comprehensiveness of service content

Prevention focus –integrating public health, intersectoral action on social determinants

Patient focused personal care services, curative, rehabilitative, supportive, and emergency care services with management of multiple morbidity, chronic conditions

SERVICE PROCESS/ORGANISATION

Longitudinal continuity; client enrolment

Relational continuity; gatekeeping, effective referral

Informational continuity; electronic records

Co-ordination of services and intervention plans, pathways for area or group

Collaboration across levels, gatekeeping, and referral systems

Organisation of support for innovation

DOMAIN 5: MANAGING AND SUSTAINING CHANGE

Sharing of vision, continuity of change

Organisational features- leadership roles, resources, competencies, preserving local focus in national reforms

Transformational capacities-transactional, communication skills, improvement and review processes

Use of information systems and technology; use of evidence

Supportive systems- PC change within wider system changes, sociopolitical support, incentive structures, multiple channels and incentives

SERVICE FEATURES

Availability

Comprehensive-ness-person centred, holistic

Access, equity for first contact; universaility

Quality-service, referral

Effectiveness, appropriate-ness, safety

Efficiency-costs, value, allocative and productive

Trust within the system

DOMAIN 3: SOCIAL ROLES

PC –SOCIAL INTERFACE

Service orientation to community, population health, outreach

Patient/people centredness, involvement - in design, delivery, review

Family –centred, involvement

SOCIAL FEATURES

Social empowerment, health literacy, roles, information

Social, client choice and trust in their health system and PC practice

Social accountability on performance

DOMAIN 4: OUTCOMES

HEALTH SERVICE OUTCOMES

Acceptability, responsiveness, adherence, better care

Coverage, utilisation

Health gain for resources applied- health value for money, including in health satisfaction, quality, cost and financial protection

HEALTH STATUS OUTCOMES

Health status - better health, wellbeing, mortality, survival

HEALTH EQUITY OUTCOMES

Financial protection, medical bankruptcy

Inequalities in access coverage, utilisation

Inequalities in health wellbeing reduced mortality, survival

Systems – as a set of elements or processes working together in an interconnecting whole – are complex, dynamic and adaptive, with multiple interactions between the different constructs and features. The arrows linking domains and constructs in *Figure 1* suggest synergies between them, where changes in one area create new pressures or dynamics in other areas.

There may be important links within domains. For example, the manner of enrolment or registration of clients with a PC practice has implications for how the PC system plays a role as gatekeeper in referral, in follow up for prevention or chronic care and/or the options for payment for services.

There are also important links across domains. For example, the organisation of the wider health system in Domain 1 provides an influential context for what takes place in more specific domains of PC practice. Not only does this context need to be understood, but so too do the changes taking place within it, including in relation to the role played by the different private and public actors in influencing that change.

4.2 Content of constructs and categories and their measurement

Table 2 shows in more detail the content of the domains and constructs shown in *Figure 1*, using numbered references in the reference list for the source of the information.

Table 2: Domains, constructs and measures for the framework

CONSTRUCTS (In the domains)	CONTENT (content in italics have highest frequency of inclusion in the literature)	SOURCE: reference # in 6.1
DOMAIN 1: CONTEXT/ SYSTEM/STRUCTURAL		
Structural: Demographic, sociopolitical and economic context		
National socio-political and governance context	*The political and social culture, including social and solidarity values and norms in relation to social inclusion and participation and the central/ devolved organisation of government and state.* Beliefs, religious and ethnic identity, and preferences for and strengths, accountability and social inclusion of political and legal institutions and processes. Political agenda; norms on social participation, social solidarity; non-discrimination, individual and social rights and freedoms, and their impact on policy and institutional development and on lifestyle choices. The organisation of the government and state in centralised or devolved/ federal systems. Transparency, lobbies, interest groups in public policy making; the level of social networking, social inclusion and support, of social participation in politics and community life. Socio-demographic profile, education levels; ageing population.	8, 12, 1, 37, 40
National economic context	*The level of aggregate income and of social and geographical inequality in incomes/ wealth.* Rate of economic growth, inflation, deficit. Levels of poverty, deprivation, employment, incomes, economic mobility; the urban-rural distribution of the population and economic activity; environmental resources. The level of economic liberalisation/regulation; free market orientation of the economy and extent to which this is applied in the social sectors, including health. Level of treatment of the health sector as economic sector, i.e. subject to economic and trade rules. Prioritisation, investment in and spending on social sectors; tax/insurance based social welfare.	4, 5, 6, 7, 21, 40, 41
National health and health system context	Environmental, dietary, lifestyle and social patterns affecting health, e.g. smoking, alcohol, exercise, nutrition, housing, affecting chronic conditions. The disease pattern and burden, including from chronic conditions and multi-morbidity. Inequalities in health, including by sex, age, socioeconomic group, and the population group, ages most affected. Level of coverage of health care and gaps in universal coverage.	1, 4, 6, 8, 33, 41

CONSTRUCTS (In the domains)	CONTENT (content in italics have highest frequency of inclusion in the literature)	SOURCE: reference # in 6.1
Structural: Health system context		
Policy and the extent of a national primary-care orientation	*The organisation, segmentation, universality of the health system. Level of policy and health workforce support for and clarity of vision and mission for the role and organisation of PC in high performing, equitable, patient-centred and universal health systems. Clarity of and social literacy on PC goals, public health, social determinants of health in health goals and systems.* Presence of specific policies and goals for PC that are relevant to the health profile, prioritised, well defined and measurable, and politically/socially and technically compelling, including for equity in access, for collaboration across sectors and within the health sector. Willingness to support and resource the role of PC, with good quality data, reporting and tools supporting the policy. Influence of particular social, interest groups on policy.	2, 5, 11, 16, 23, 30
Laws	*Whether the state has a legal duty to ensure health services; extent, devolution and harmonisation in federal regulation to ensure service access, e.g. on place; accreditation of PC practice, workforce practices and accountability.* Regulation of health resources to ensure value, equity and prevent misappropriation. Legal provisions to reinforce PC systems, e.g. for 24-hour coverage, on scope of practice of different health workers; for certification of providers; for professional autonomy; for quality assurances and patient rights; for balancing privacy with information access and exchange for PC. Presence of an ombudsman or commissioner and strength of regulatory capacities and enforcement of law, including on malpractice.	3, 4, 6, 8, 11, 13, 16, 29, 36
Governance/ stewardship of the health system	*Level of (de) centralisation in policy and service development, in powers and management of PC between central (federal/national) and subnational (state/local) levels. Public/ patient empowerment and accountability at macro-level – public rights, advocacy and shared decision making; backed by education/information; procedures (e.g. for complaints); access to a publicly accountable body with transparency on system performance.* Location of policy, organisational, commercial, professional authority; power of regional (cross national), national and subnational units to set policies, subsidies, beneficiary eligibility levels, make financing decisions, determine services provided and regulate practice models. Use of research (technology assessment, effectiveness analysis) in policy/ practice decisions. Extent of public/private agency involvement at policy/service level from other countries; Level of leadership, 'buy in', effectiveness of planning and monitoring; presence of strategies for change management and performance measurement.	4, 5, 11, 14, 16, 22, 23, 29, 32
Organisation of the health system	*Diversity of models between and within countries; levels, resourcing, roles and distribution of public, for profit/not for profit providers.* National/state system; single/multipayer/national health service or social insurance service; public, private and out-of-pocket spending levels and shares; funding flows to private (for profit and not for profit) and public services and on public health. Administrative cost shares; misappropriation levels; public (central /local); private for profit/not for profit ownership and segmentation of funding and of services. Main type, ownership and size of primary care provider (GP/general internist/ paediatric internist/ family physicians/ obstetric and gynae interns/ general). Relationship with specialty care services, outreach services (e.g. physiotherapy) and with clients. Patient enrolment; inclusion/exclusion of undocumented groups. Among providers, provisions for quality assurance/improvement culture, mechanisms and standards, professional education, clinical guidelines, performance measurement, monitoring (see also Domain 2).	1, 4, 5, 8, 10, 14, 16, 23, 32, 33, 35

CONSTRUCTS (In the domains)	CONTENT (content in italics have highest frequency of inclusion in the literature)	SOURCE: reference # in 6.1
Financing the health system	*Level and rate of growth in costs; type of financing - tax/social security/private funding; level/prioritisation of expenditure on PC. Latitude for price increases and risk exclusion; public/private funding flows to public/ private for profit/not-for-profit providers and to administrative expenditures Method of reimbursing PC workforce: - capitation, outcome based (pay for performance); salary, fee for service, blended.* Financing principles: adequacy, equity, universal coverage. Funding models: public/ private insurance/tax funding; pooling; coverage; controls on administrative costs etc. Resource allocation: extent of needs-based allocation in PC resources; incentives for practice in underserved areas; flexibility of allocations; links to outcomes. Purchasing /payment models: fee for service/ capitation/ salary or blended payments; reimbursement rates for PC services for common conditions, PC delivery characteristics Limits to co-payments; profit ceilings; risk adjustment measures.	3, 4, 5, 6, 8, 11, 13, 16, 18, 23, 29, 32, 35, 36
Workforce development and regulation	*Shortfalls, training and mix; remuneration - capitation, salary, fee for service, pay for performance, blended payments* Profile of PC workforce (physicians, nurses, nurse practitioners, physician assistants, nurses' aides, social workers, community health workers); role of pharmacists in PC. Professional status, autonomy and recognition of PC personnel; employment status (salaried, contracted, self-employed), role and strength of professional associations. Forecasting, planning and measures for workforce replacement and capacities. Strategies for increasing staff skills; Academic status, strength of academic PC departments; government support for PC workforce training. Level of reliance on international medical graduates.	2, 5, 6, 7, 8, 13, 16, 23, 34, 41
DOMAIN 2: PC SERVICE DELIVERY/ MODEL OF CARE/ MODE OF PRACTICE/ PROCESS		
Service inputs		
Workforce density, type and capacities	*Type, density and task allocation of PC workforce and distribution by geographical area; PC practice size, networking.* Type of physician providing PC - GP/general internist/paediatric internist/family physicians/ obstetric and gynae interns/ general; role of nurse practitioners (NPs) and physician assistants (PAs). Which category of personnel 'leads' the PC team. PC training, continuing health education. Frequency of visits by/links with specialist teams to PC level; links with and full/part time secondment of staff from community agencies in PC services; links with and role of community health workers (CHWs), volunteers. Extent to which training is PC oriented; technical and cultural competence - abilities to assess, treat and communicate with clients. Practitioner knowledge of patients' context.	2, 3, 4, 5, 6, 7, 9, 11, 13, 23, 34, 36, 43, 44
Workforce organisation, provider teams and collaboration within the same PC practice, and between different PC providers and workers	*Team-based approaches, with multidisciplinary teams (combining physician, nurses, NP, PA, dentist, pharmacist, CHWs) and allocation of tasks, workload sharing, according to skill set and scope of practice rather than discipline.* Application of PC team to defined geographical area/ family/social units; skills mix and task allocation (including levels of physicians and practice nurses and of task shifting); Processes for team-based care - e.g. daily team huddles, goal analysis, intrateam co-operation; GP co-operatives. Organisation of workforce support, quality improvement coaches and performance review. Levels of and support for time costs of administrative burdens of PC providers, entering patient records, co-ordinating care with specialists, billing and getting insurance approvals.	1, 2, 5, 11, 12, 14, 15, 16, 23, 24, 32, 34, 36, 41, 44

CONSTRUCTS (In the domains)	CONTENT (content in italics have highest frequency of inclusion in the literature)	SOURCE: reference # in 6.1
Workforce incentives	*Financial/other recognition of PC workforce relative to specialists.* Financial: e.g. bonus payments for team practice; loan forgiveness for PC practitioners; pay for performanceNon-financial: e.g. professional status and recognition; access to tools and resources for skills improvement; recognition of excellence; of good PC practice; goal congruence between worker and organisation; level of job satisfaction, retention, assessment of rewards vs challenge. Context for incentive structures – impact on cherry picking patients; reward of specific processes vs system outcomes, impact on attention to other areas. Support for PC administrative burdens.	2, 3,4, 5, 6, 7, 8, 11, 12, 13, 21, 23, 32, 39
Medicine, technology Equipment, Infrastructure	*Assessment (by public institutions) and regulation of/incentives for ensuring value for money, controls on costs and equity in benefit from medicines, technology.* Availability of PC infrastructure, medicines, appropriate equipment. Existence of guidelines for appropriate PC technology (medicines, IT, equipment, procedures). Technology and medicine appraisal systems for effectiveness, value in public sector and links to regulation or financing. Prescribing practices and audits; test and results tracking; accuracy of diagnoses; levels of adverse effects of medication; avoidable hospitalisation.	4, 5, 7, 9, 11, 14, 23
Service content		
Person-centred, needs-based first contact	*Extent to which primary care can be accessed and used as first contact; level of inappropriate use of hospitals* See also *gatekeeping role under service organisation* and other service features below (availability, access, acceptability etc). Outreach, community health services Orientation to individual and population needs, population health focus; communication with clients on preventive and other care services. Client-driven goals. See also enrolment measures.	2, 4, 6, 8, 13, 20, 21, 23, 30, 34
Prevention focus: health promotion, public health, disease prevention	*Focus on, incentives for wellbeing and prevention at individual and population level.* Level and nature of population and client directed services for wellbeing and ill health prevention, including health promotion, education, counselling, screening, early detection with tools for identifying high-risk patients (e.g. in prenatal care), prevention (e.g. vaccination) and mental health services and collaborative programmes with other services. Incentives, reimbursements and guidelines for prevention activities.	2, 4, 5, 6, 10, 11, 14, 22, 23, 30, 44
Public health and integration of services by other sectors	Measures for ascertainment of client needs for improved health and linking/referral to additional non-health sector services (e.g. job training) and collaboration with non-health providers (e.g. social service centres, municipality) for clients to obtain these services and for intersectoral action to address social determinants of health. Level of co-operation between primary care, preventive healthcare, public health and occupational health services, and policy and resource support for integrated models. Level of delivery of public health activities through PC service partnerships, inter-professional teams and shared protocols.	2, 5, 11, 14, 17, 22, 23
Personal care services: curative, rehabilitative and supportive care, emergency services; management of multimorbidity, chronic conditions	*Whole person/patient-focused care vs disease-focused care comprehensively address the spectrum of health needs.* Presence of guidelines for generic, multiple health aspects of client care, management of chronic conditions, co-morbidities, mental health and substance abuse. Including areas such as mental health, oral health. Measures for assessing client needs and capacities; stratifying patients, comprehensive disease management in the least intensive setting and involvement of patients in their care (see Domain 3); measures to minimise unnecessary visits. Screening, medical and counselling services and related ambulatory and community interventions. Identified responsibility for after-hours care by PC or secondary level. Use of clinical pathways, protocols and guidelines; integration and co-ordination of care across organisational boundaries and generalist and specialist care. Involvement of multidisciplinary team approaches (see earlier); specific measures for patient compliance, motivation and capacity. Use of patient registration, electronic medical record (EMR) and recall systems.	4, 5, 6, 7, 8, 11, 14, 15, 23, 24, 32, 44

CONSTRUCTS (In the domains)	CONTENT (content in italics have highest frequency of inclusion in the literature)	SOURCE: reference # in 6.1
Service organisation/ process attributes		
Longitudinal continuity – person-focused care over time that are coherent over the short term within and among teams (*cross-sectional continuity*), or as an uninterrupted series of contacts over the long term (*longitudinal continuity*)	*PC as a specific locus where a patient is able to get care when needed from an organised team of providers in an accessible and familiar environment; extent of uninterrupted PC and physician/PC carer provision of person focused care over time.* Ability to manage their clients' changing needs (medical care, rehabilitative care, health prevention and promotion) at different stages of life in all settings (a primary care facility, home, and community), through timely and complementary services within a shared management plan. Duration of practice-client relationship. Funding mechanisms that span care sectors, e.g. bundled payment for care episodes, multisector capitation of general/ specific populations; operational agreements across establishments; communication at care transition points; formal mechanisms for information transfer between PC physicians and specialists. Measures to address the health of non attenders. Measures and application in solo or multi-GP practices.	2, 3, 4, 5, 8, 9, 11, 13, 14, 17, 20 21, 23, 29, 30, 43, 44,
Relational (or interpersonal) continuity in the relationship between patient and provider	*Client choice to and registration with a specific PC practice, and use of practice lists, effective referral and PC gatekeeping role as entry point for referral.* Organisational arrangements to facilitate continuity and access. Presence of well-defined registered populations, measures to address population diversity; local problems; continuity of provider. Provider communication skills; use of home visits; after-hours service; phone/email consultations, appointment systems, special patient groups.	3, 5, 6, 7, 11, 13, 17, 22, 23, 34, 44
Informational continuity	*Continuity across contacts and PC providers of comprehensive organised patient medical, social information.* Content and nature of Information system – whether all health related information contained for detecting/ tracking multimorbidity and risk; whether providers keep records of their clients' care and services throughout their life span; whether records are organised by family or individual. Use of registries, clinical decision support, prompts and reminders, including for preventive care. System-to-system interoperability of EMRs. PC capacities, support and incentives for record keeping, for EMRs; peer exchange, patient and population-based planning and public reporting of health patterns and service performance.	4, 5, 6, 8, 11, 13, 14, 17, 29, 41
Collaboration between PC and other care levels through referral, including access to specialists	*PC as accessible gatekeeper for improved referral.* PC as first contact (see earlier). When clients require services PC providers cannot provide, how PC providers refer their clients to other health partners and monitor on their clients' care. Communication between primary care and hospitals/other levels. Standardised referral processes; disincentives (e.g. additional payments) for bypassing primary care level	2, 5, 6, 8, 11, 14, 43
Co-ordination of services	*Collaboration of care, care pathways and partnership with other health and community services resulting in coherent prevention and treatment plans.* Co-ordination of information and services and interlinkages among staff members and agencies over an episode of prevention and care. Extent of physician co-ordination of services; skill mix (also under workforce); delivery of certain public health activities in the context of PC; goal-driven co-operation between primary care, preventive healthcare, public health and health programmes in other settings (school, workplace).	2, 3, 5, 9, 13, 14, 15 20, 22, 29
Organisation support for process Innovation	New ways of care provision, e.g. telephone visits, email, Facebook and text message communication with patients; group medical visits. Willingness in PC team to think differently; regular and systematic exchange of experiences and programmes for innovation between patients/families, professionals, managers and policy makers, and for stimulating dissemination of best practices in PC provision and policies (see also Domain 5).	2, 22, 32, 44

CONSTRUCTS (In the domains)	CONTENT (content in italics have highest frequency of inclusion in the literature)	SOURCE: reference # in 6.1
Service features		
Availability	Geographic availability - volume and type of PC services relative to population needs; PC infrastructure. At PC level: practice culture, clinic structure and services. At workforce level: time to appointment; meeting patients for urgent care at hospital A&E.	5, 20, 23
Comprehensiveness of services; patient-centredness, holistic nature of care	*Extent to which a full range of services is either directly provided by a primary care physician or other provider or specifically arranged elsewhere. Range of services offered to meet common needs with a whole person orientation.* Use of population evidence to plan services; whether clients can obtain a range of services including medical and rehabilitative care, health promotion and prevention, counselling and mental health services at PC level; management in relation to disease burdens; physical and psychosocial aspects. Adequacy of personnel, facilities, equipment, supporting services, and use of clinical pathways and guidelines in evidence-based care.	4, 5, 8, 11, 13, 14, 29, 42
Access/ accessibility and equity	*Ease with which services are obtained when needed. Waiting times. Geographical and financial access. Affordability of needed services regardless of client financial status and extent of cost sharing/OOP/fee for service/co-payment at PC.* Extent to which population uses the services when a need is perceived; geographical: limitations/characteristics of primary-care facilities, distance, access by transport; 24- hour access - opening hours, timeliness; portability of cover affordability of services; use of resources to accommodate access; premium and cost-sharing subsidies; inclusiveness, controls on risk selection, cherry picking and denial of care. Organisational arrangements to facilitate access (phone/ email consultations, appointment systems, special patient groups); improved access for at-risk patients.	1, 4, 5, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 23, 29, 30, 41
Service quality	Provider procedures, funder payment arrangements aligned to quality goals and quality improvement for PC services as technical efficiency, including for effective/ appropriate referral to secondary care and terminal care; correct prescribing practices. PC procedures including: ongoing performance measurement; clinical audit; collaborative quality improvement initiatives, quality coaches; adherence to clinical guidelines; and quality improvement training. Availability of clinical decision support tools, IT and practice guidelines to support PC practice.	2, 4, 7, 11, 14, 23, 26, 27, 32, 41
Service effectiveness, appropriateness, safety	*Safe error-free care* Degree of achievement of desirable outcomes. Appropriate use of diagnostic and therapeutic modalities (see also Service quality above). Degree to which PC services are relevant to the health and clinical needs, given the current best evidence and health care processes avoid, prevent, and ameliorate adverse outcomes or injuries that stem from the processes of health care itself.	2, 8, 9, 11, 14, 15
Service costs and efficiency, better value for money	Allocative and productive efficiency - minimising cost to client, maximising outcome per capita cost of care. Measures for and extent to which use of available resources is optimised to yield maximum benefits or results, and ability to function at lower costs without diminishing attainable and desirable results. Reduction of waste, inappropriate treatment, overtreatment and fraudulent spending. (Macro-efficiency in terms of the overall allocation of public and private expenditures in the health system. Micro-efficiency in terms of the value for money realised with available resources, including efficiency in performance of PC workforce).	2, 9, 14, 18, 23
Trust, supportive relations within the system	Relations between and within workforce, management and leadership of the system; beliefs about the organisation and outcomes of the PC systems (limited reference to this construct in the PC literature); recognition and support for administrative burdens, challenges of PC providers work.	6, 12

CONSTRUCTS (In the domains)	CONTENT (content in italics have highest frequency of inclusion in the literature)	SOURCE: reference # in 6.1
DOMAIN 3: PUBLIC/SOCIAL ROLES		
PC – social interface		
Population, community orientation of PC services	*Community orientation as PC providers manage health problems not only at an individual level, but population level by considering community factors, using community evidence to plan and evaluate services (e.g. COPC model) and integrating community outreach.* Providers are aware and act according to cultural and health problems in the community. Involve and provide mechanisms for community input and networks in planning and delivering services.	1, 4, 8, 11, 13, 17, 19, 26, 42, 44
Patient and people–centredness, engagement and responsiveness, accountability involvement in the interface between services and communities	*How a system treats people. Extent to which PC services build long-term good relationships with clients, involve clients in the design, delivery and evaluation of services and the level of acceptability of services; use of lifetime electronic health records.* In the interaction with clients and communities: practice knowledge of the client; plan, goal setting for appropriate self-management at every encounter; providers listening to patients, focus groups on care improvement; client degree of affiliation to the service; patient's experience of their health care, communication and understanding, satisfaction. Use and continuity of IT to support client centredness; records; follow-up calls, outcome information. In the organisation of services: elimination of activities or services that add no value for patients; integration of social aspects (e.g., economic status, cultural) and participation of communities in shaping care and services; co-ordinated patient flow processes; duration of consultation; provider explanation of care options; communication skills; transparency to patients on pricing issues. In relation to clients: guidelines for patients and training to increase patient assertiveness in consultation.	1, 2, 5, 6, 7, 8, 9, 11, 12, 14, 15, 17, 38, 43, 44
Family-centredness Service orientation to family	*Patient-family-community interface and family centredness.* Provider awareness of clients' family history and care preferences. Appropriate engagement with family members in medical decisions, family support; explicit assumption of responsibility for care of families. Implementation of home visits.	1, 2, 4, 8, 11, 13, 15, 17, 19, 26
Features of society in PC systems		
Social and client health literacy, roles and empowerment	*Clients are empowered, informed and educated to act on their own health, obtain additional information and make input and decisions with respect to their care and service preferences.* Bottom-up decision making, community consultation; clients and community members ability to provide inputs on how their primary care services can be improved; engagement of all stakeholders (providers, clients, administrators, purchasers and experts) in developing, monitoring and/or assessing the system (tools, processes). Extent to which the system facilitates patient input, and patient control over his/her record in terms of both access and use.	2, 11, 14, 17, 18, 22
Social and client choice and trust; social accountability	Public information from and on services; Patient choice and enrolment with a PC practice from appropriate alternatives; client willingness to obtain care from providers; perceived provider understanding of client culture and client beliefs about outcomes, client trust in a freely chosen PC service and confidence to share problems and concerns. Client perceptions of their ability to get an appointment for needed urgent care as quickly as they wanted. Provider adherence to commitments, norms, and patient preferences/values.	1, 2, 4, 6, 9, 12, 16, 17

CONSTRUCTS (In the domains)	CONTENT (content in italics have highest frequency of inclusion in the literature)	SOURCE: reference # in 6.1
DOMAIN 4: OUTCOMES		
Health service outcomes		
Acceptability; responsiveness; adherence	Patient and provider satisfaction Patient experience of care Satisfaction-expense ratio	1, 2, 3, 6, 11, 16
Coverage/ utilisation rates	Coverage/utilisation rates and trends for specific conditions/areas Collateral benefits across different service areas	6, 18
Health status outcomes		
Health status, 'better health'	Self-perceived health, wellbeing Disease control (BP, glycaemic) Teenage pregnancies Aversion of new NCD events, secondary prevention, increased early detection, e.g. for cancer, CHD Post-surgery care outcomes Premature mortality more than overall and cause specific mortality Disease specific potential years of life lost e.g. for asthma, CVD Disability from mental ill health; asthma, CCF	1, 2, 3, 4, 6, 7, 11, 18
Health equity outcomes		
Financial protection; equity	Costs to clients; rational use of resources (e.g., reduced fragmentation and duplication) Relative levels and distribution of prepayment (tax or insurance) vs direct charges Levels, distribution of catastrophic health spending, medical bankruptcy Cost savings to clients and services due to reduced utilisations	4, 11, 18, 41
Health inequalities; access	Geographical and social inequalities in resources, personnel. If evaluating PC systems in terms of their impact on equity, then geographic regulation, financing, and access (co-payments) noted to weigh more heavily than provider type and family orientation Access to services in vulnerable groups	5, 7, 8, 18
DOMAIN 5: MANAGING AND SUSTAINING CHANGE		
Organisational and leadership roles, resources and competencies	*Organisational values, level of clear and shared goals, transformational leadership with clarity on elements for and benefits of change, and of collaborative practice-based networks for exchange, voice and scale up.* Sustained leadership of any person, group or organisation exercising influence; sustained clinical and managerial leadership; support from outside the practice, including the larger healthcare system and community; role of champions or a parent organisation; public, stakeholder, staff participation, empowerment; PC provider voice in the wider health system and as a community leader. Management, support, feedback and accountability systems that incentivise innovation. Quality improvement activities aligned with targets, accountability and performance agreements. Measures for addressing tensions and trade-offs in balancing professional and bureaucratic control and in the linking of quality and accountability mechanisms; conflict management. Resources allocated for change processes; work stress and time available for changes; pace of change. Workers autonomy for, perception about possibility of task accomplishment.	2, 6, 11, 12, 14, 26, 27, 28, 39

CONSTRUCTS (In the domains)	CONTENT (content in italics have highest frequency of inclusion in the literature)	SOURCE: reference # in 6.1
Transforma-tional/ transactional skills and processes.	*Opportunities for small-scale testing, for reflection and learning. Spread strategy, provider networks to facilitate communication of successful practice between providers.* Interactional determinants. Capability, readiness for change - collective expertise, motivation, cohesion, role of 'early adopters'. Stakeholders' understanding and ownership of change options. Workforce motivation, commitment to, goal congruence, multiple channels for worker motivation and worker beliefs about the outcomes. Regular and systematic exchange of experiences and programmes for innovation between patients, professionals, managers and policy makers, and for stimulating the dissemination of best practices in primary care provision and policies; mapping office processes to identify improvement opportunities; use of measurement and improvement methods and plan-do-study-act cycles for small rapid changes; integration of successful improvements into regular functioning. Existence of a virtual learning community-webinars, team learning; support for transfer of proven improvement approaches across sites.	2, 6, 11, 12, 22, 26, 27, 28, 39
Use of information and monitoring systems	PC information infrastructure; information management systems. IT capacities and use in PC workforce. Speed and level with which information is recognised and used for care. Use of information, e.g. for review of quality, access and cost against well-defined goals and to understand population needs. System for PC performance measurement that address multi-stakeholder needs, including for public information.	2, 4, 5
Supportive systems - embedding PC in wider system changes	Level and duration of social, political support; social values and expectations and organisational culture in the health system. Multiplicity and coherence of channels supporting change; Changes in health system features and their effect on PC - e.g. in tax financing, geographical allocation, measures for training and employing PC physicians, bureaucratic systems, management, accountability, and compensation structures and systems that incentivise (or block) innovation and new behaviours and practices.	8, 36, 39

5. Discussion

The detailed elements of these domains and constructs outlined in *Table 2* provide an indicative, rather than a prescriptive, list to guide review and analysis, to point to broad domains and constructs as thematic categories within which to organise evidence on PC. The more detailed elements within constructs are prompts rather than checklists for understanding how different systems are or are not delivering on health and health care outcomes.

While the domains and constructs have relevance in all settings, not all have equal priority in strengthening the PC system in different countries. Health systems vary according to their wider socioeconomic, cultural and political contexts and the principles of their organisation. A later paper in this project, synthesising evidence from the background review papers gathered within this broad conceptual framework, identifies some of the key challenges specifically for the US health care system and the specific questions around which learning from other countries may have relevance (Loewenson et al 2014).

The diversity of PC models, including across different subnational levels within countries, is associated with a number of features of the wider health system. These include the diversity of financing systems, the market or public sector orientation of the system; the level, e.g. prioritisation of expenditure on PC and methods of registering clients or of reimbursing the PC workforce. The table shows, at least from the literature, **contextual** features that are raised in the literature as having relevance to PC practice, particularly in relation to the health system context:

- The organisation, segmentation and universality of the health system, its financing and its distribution of resources, roles and authorities across public, for profit and not-for-profit providers;

- The level of policy support and clarity of vision and mission for the role and organisation of PC in high performing, equitable, patient-centred and universal health systems, and clarity of PC goals set within general health system goals;

- The extent of regulation in the health system, including introduction of new technology and accreditation of PC practice to support equity in access and value for money;

- The mechanisms for controlling out-of-pocket and catastrophic expenditures;

- The level of (de)centralisation in policy and service development, in powers and management of PC between central (federal/national) and subnational (state/ local) levels;

- The mix of workforce skills and their organisation; and

- The attention and means given to public and patient empowerment and social accountability in the system.

The framework sets PC as a locus (where a patient is able to get care when needed from an organised, usual team of providers in an accessible and familiar environment) and as a process (where inputs and services are organised to provide person-focused care over time). Within this the framework identifies as key constructs the various forms of continuity also identified in many other frameworks, i.e. longitudinal, relational and information continuity.

Within the PC system itself the mode of care is shaped by the services inputs (workforce, medicines, resources, infrastructure and technology), the content of the services and the processes of service delivery. A wide range of features is identified within each of these areas. Those most prominently noted in the literature and in the framework include:

- The level of focus in PC services on prevention, on population health and on whole person/ patient-focused care vs disease-focused care.

- The type and density of PC workforce and distribution by geographical area.

- The role of team-based approaches and of multidisciplinary teams with tasks allocated and shared according to skill set and scope of practice.

- The extent of and systems for client enrolment/ registration and the population health focus of PC practice.

- The manner and level to which PC practices serve and are used as first access and gatekeepers for the wider health system and for links with supporting services outside the health system.

- The level to which PC practices are networked and supported for functions and capacities that may be difficult to achieve within single practices.

Further analysis should address the extent to which the PC system functions effectively as entry point and gatekeeper or support for access to the referral system, and collaborates with other services, including those outside the health sector, to ensure these features of continuity. Further, and linked to the later domain of change management, the framework includes the extent to which innovations in health reach are motivated by, and accessible to, PC practice.

In a systems mapping these broad domains and their detailed elements don't lie in 'neat boxes' with unidirectional linear relations. They interact in synergistic positive or negative relationships, across elements within and across domains. The simple representation in *Figure 2* communicates an interactive system, with many levels of interaction that affect the PC system and the relationship of interest: that is its role in producing improved health outcomes, with more effective, efficient and equitable use of resources.

The framework acknowledges this complex, dynamic and adaptive nature of the systems shown, and the multiple and colinear relationships between different constructs and features. The arrows linking domains and constructs in *Figure 1* and the interfaces in *Figure 2* suggest this synergy and interaction between domains, constructs and elements within constructs, where changes in one area create new pressures or dynamics in other areas. The literature reviews and country case studies separately reported point to these inter-relationships and to those that appear to be more decisive in the contribution of PC systems to greater improvements in the health (and health care, health equity) gains relative to the resources applied, particularly for those with greatest health needs.

Figure 2: Mapping the PC system and its determinants and interactions
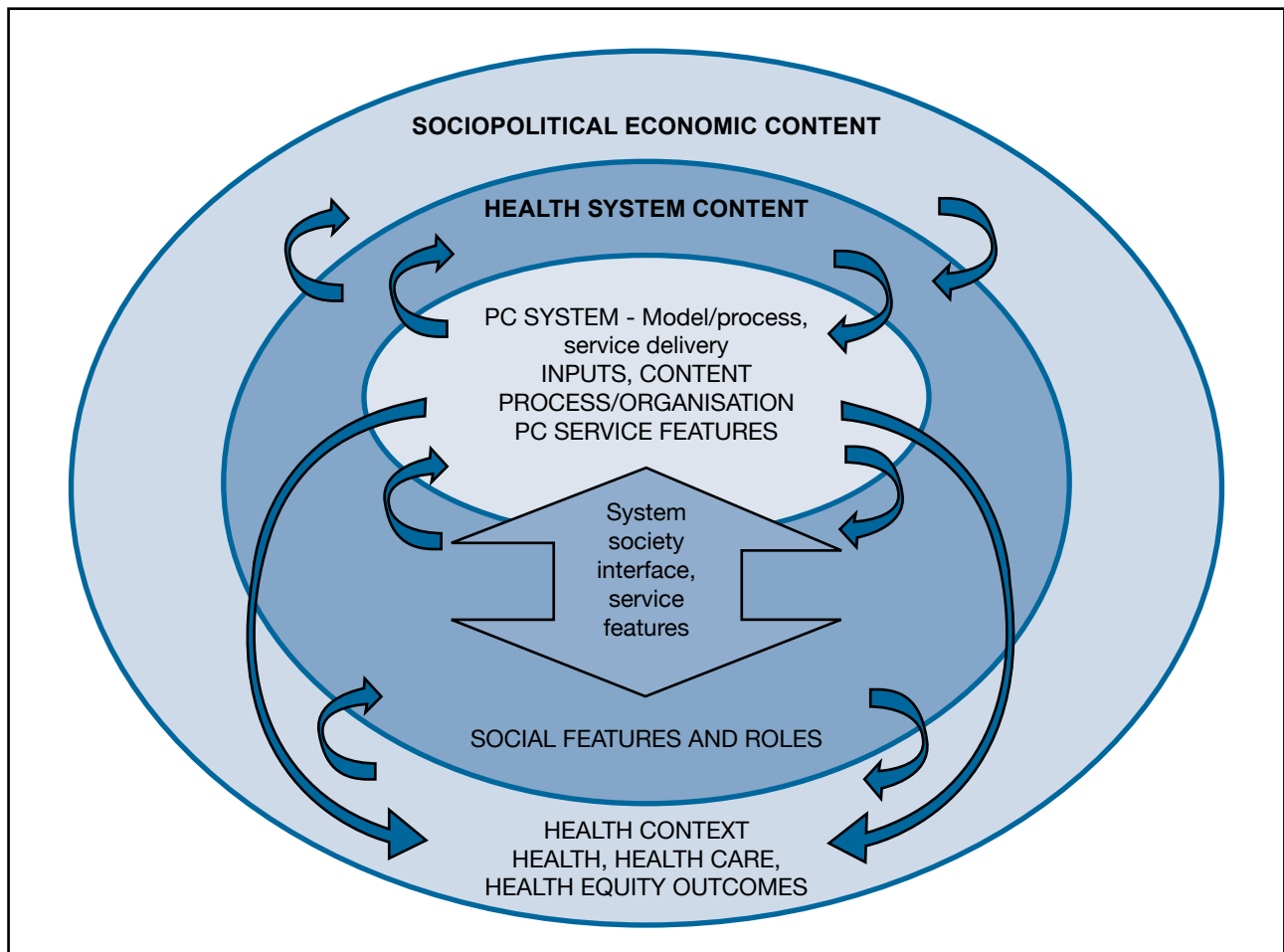
The framework gives specific attention to the **interface between the PC system and the society** it is located in. This is identified as playing a role both in the experience and perception of the service features, in the delivery of a person- focused care approach and in the transfer of practice and learning from one context to another. It also plays a political role in the social support needed to sustain momentum of change in PC services and to give legitimacy to the policies being applied. Within this domain, some features of the society itself need to be understood (the empowerment, health literacy and roles people have and the trust, perceptions and social beliefs people have in relation to their health care system). Equally there are features of the interface between the society and the health system, such as the extent of orientation of services to clients, families and communities, the involvement of clients in planning and decisions on their care and, within this, the measures put in place to support this.

The **health outcomes** identified include commonly used measures of acceptability, coverage and distribution of benefit in health care and health status outcomes. While measures of inequalities in health and in access to health care and the level of financial protection are less commonly described in other frameworks, they are included as outcomes. They have a relationship with key features of PC (prevention oriented, population approaches; access to first point of care, reducing cost barriers etc) and with policy goals of widening access in vulnerable populations and ensuring that resources are used to obtain greatest health improvement for those with highest health need.

Finally, the model draws on a less well-developed set of information for the domain on **managing and sustaining change**, including literature on continuous quality improvement and performance management. Constructs in this domain (organisational leadership, competencies and resources, transformational skills and processes, use of information systems and support from wider systems) shape how the model and functioning of PC and the interface with society are able to meet challenges, absorb innovation and take up areas of change. While the domain refers to change management *within* the PC system, PC champions and actors can also influence the wider health systems, such as when evidence shows positive impacts of models, or when changes are supported by professional, social and policy alliances. The model also recognises the support needed to manage change at national level, while keeping the focus of PC local and connected to communities. This includes measures for integration of community and local practitioner voice in design of reforms, for horizontal networking and vertical support of PC practices and approaches that facilitate and use local evaluation and review involving practitioners and communities as part of PC practice and reform processes.

The framework is a means and not an end, and its primary purpose is to guide the next stages of review and analysis. The evidence and analysis in the project from the desk reviews and the country case studies will further deepen understanding of the constructs and elements of and linkages across the framework, by:

- Identifying and highlighting those constructs and areas of content that appear to have most significance in understanding how PC systems produce widest, most sustained and equitable health gain for resources applied;

- Identifying more clearly the linkages between domains and constructs that are associated with improved services features and health outcomes; and by

- Identifying plausible pathways connecting specific contexts, constructs or elements within and across domains where PC models and practices are associated with improved health outcomes.

6. References

6.1 For the framework

1. Harzheim E, B Duncan, AT Stein, CRH Cunha, MR Goncalves et al. (2006) 'Quality and effectiveness of different approaches to primary care delivery in Brazil', *BMC Health Serv Res* 6:156.

2. Kates N, B Hutchison, P O'Brien, B Fraser, S Wheeler et al. (2012). 'Framework for advancing improvement in primary care', *Healthcare papers* 12:8–21.

3. Starfield B (1991) 'Primary care and health. A cross-national comparison', *JAMA* 266:2268–71.

4. Starfield B (1994) 'Is primary care essential?' *Lancet* 344:1129–33.

5. Kringos D, W Boerma, Y Bourgueil, T Cartier, T Dedeu et al. (2013) 'The strength of primary care in Europe: An international comparative study', *Br J Gen Pract* 63:742–50.

6. Starfield B, LShi, J Macinko (2005) 'Contribution of primary care to health systems and health', *Milbank Quarterly* 83:457–502.

7. Starfield B, L Shi (2002)' Policy relevant determinants of health: An international perspective', *Health policy* 60: 201–18.

8. Macinko J, B Starfield, L Shi (2003). 'The contribution of primary care systems to health outcomes within Organisation for Economic Cooperation and Development (OECD) countries, 1970–1998', *Health services research* 38:831–65.

9. Kelley E and J Hurst (2006) 'Health care quality indicators project conceptual framework', *OECD health working papers 23*. OECD: Paris.

10. Mattke S, E Kelley, P Scherer, J Hurst, ML Gil Lapetra, the HCQI Expert Group Members (2006) 'Health care quality indicators project initial indicators report', *OECD health working papers 22*) OECD: Paris.

11. McMurchy D (2009) 'What are the critical attributes and benefits of a high-quality primary healthcare system?' Submitted to *The Canadian working group on primary healthcare improvement*. Canadian Institutes of Health Research: Ontario.

12. Brennan, S. E., Bosch, M., Buchan, H., & Green, S. E. (2012) Measuring organizational and individual factors thought to influence the success of quality improvement in primary care: a systematic review of instruments. Implementation Science, 7(1), 121. doi:10.1186/1748-5908-7-121

13. Stigler FL, B Starfield, M Sprenger, HJF Salzer et al. (2013) 'Assessing primary care in Austria: Room for improvement', *Family practice* 30(2):185–89. doi:10.1093/fampra/cms067

14. Stenger RJ, J Smith, JB McMullan, GS Rodriguez, DA Dorr et al. (2012) 'Defining the medical home: The Oregon experience', *Journal of the American board of family medicine* 25(6):869–77.

15. Lester H and M Roland (2009) *Performance measurement in primary care in Performance measurement for health system improvement*. Experiences, challenges and prospect 371–405. Cambridge University Press. Retrieved from http://www.euro.who.int/en/about-us/partners/observatory/studies/performance-measurement-for-health-system-improvement-experiences,-challenges-and-prospects

16. Polluste K, V Kasiulevicius, S Veide, DS Kringos, W Boerma et al. (2013) 'Primary care in Baltic countries: comparison of progress and present systems', *Health policy* 109(2):122–30. doi:10.1016/j.healthpol.2012.08.015

17. Kitreerawutiwong N, V Kuruchittham, R Somrongthong and Y Pongsupap (2010) 'Seven attributes of primary care in Thailand', *Asia-Pacific journal of public health/Asia-Pacific academic consortium for public health* 22(3):289–98. doi:10.1177/1010539509335500.

18. Kruk ME, D Porignon, PC Rockers and WV Lerberghe (2010) 'The contribution of primary care to health and health systems in low- and middle-income countries: A critical review of major primary care initiatives', *Social science & medicine* 70(6):904-11.

19. Pasarín MI, S Berra, A González, A Segura, C Tebé et al. (2013) 'Evaluation of primary care: The "Primary Care Assessment Tools – Facility version" for the Spanish health system'. *Gac Sanit.* 27(1):12–18

20. Haggerty JL, R Pineault, M Beaulieu, Y Brunelle, J Gauthier et al. (2008) 'Practice features associated with patient-reported accessibility, continuity, and co-ordination of primary health care', *Ann Fam Med* 6:116-123. Doi: 10.1370/afm.802.

21. Russell G, S Dahrouge, M Tuna, M Hogg, R Geneau et al. (2010) 'Getting it all done. Organisational factors linked with comprehensive primary care', *Family practice* 27:535–541. Doi:10.1093/fampra/cmq037.

22. Health Council of the Netherlands (2004) *European Primary Care, 20E. The Hague: The Hague.*

23. Kringos DS, WG Boerma, A Hutchinson, J van der Zee and PP Groenewegen (2010) 'The breadth of primary care: A systematic literature review of its core dimensions', *BMC health services research* 10:65. doi:10.1186/1472-6963-10-65.

24. Oldroyd J, J Proudfoot, FA Infante, GP Davies, T Bubner et al. (2003) 'Providing healthcare for people with chronic illness: The views of Australian GPs', *MJA*179: 30–33

25. Villalbí JR, M Pasarín, I Montaner, C Cabezas, B Starfield y Grupo de Trabajo sobre Evaluación en la Atención Primaria de Salud de Barcelona (2003) 'Evaluación de la atención primaria de salud', *Aten Primaria* 31(6):382-25

26. RWJF (Robert Wood Johnson Foundation) (2012a) *Advancing primary care: opportunities to support care delivery redesign in practices serving medicaid and racially and ethnically diverse patients* RWJF: New York.

27. RWJF (Robert Wood Johnson Foundation) (2012b) *Improving the science of continuous quality improvement program and evaluation.* Princeton, NJ: Robert Woods Johnson Foundation;. http://www.rwjf.org/en/research-publications.html. Accessed December 8 2013.

28. Ohman-Strickland PA, JA Orzano, PA Nutting, PW Dickinson, J Scott-Cawiezell et al. (2007) 'Measuring organizational attributes of primary care practices: development of a new instrument', *Health Serv Res* 42:1257–73.

29. WHO Regional Office for Europe (2010) 'Primary care evaluation tool', WHO Regional Office for Europe: Copenhagen.

30. Thorlby R (2013) 'Reclaiming a population health perspective: Future challenges for primary care', *Nuffield Research report*, UK

31. Johns Hopkins School of Public Health (JHSPH) (2010) 'Primary care assessment tools'.JHSPH USA http://www.jhsph.edu/pcpc/pca_tools.html (accessed on 8 June 2010).

32. McDonald, J, Cumming J, Harris M, Davies GP and Burns P (2006) 'Systematic review of comprehensive primary health care models' Canberra Australia

33. *Health systems in transition (HiT) series* (n.d.). European Observatory on health systems and policies. WHO Euro, Copenhagen, Retrieved December 17, 2013, from http://www.euro.who.int/en/about-us/partners/observatory/health-systems-in-transition-hit-series.

34. O'Malley AS, DR Samue DR, AM Bond and E Carrier E (2012) 'After-hours care and its co-ordination with primary care' *U.S. Journal of general internal medicine*, online first.

35. The Commonwealth Fund (2013) 'International profiles of health care s:ystems, 2013 Australia, Canada, Denmark, England, France, Germany, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, and the United States' Washington DC. Retrieved from http://www.commonwealthfund.org/~/media/Files/Publications/Fund%20Report/2013/Nov/1717_Thomson_intl_profiles_hlt_care_sys_2013_v2.pdf

36. Yee T, Boukus, ER, Cross DA, and Samuel DR (2013). 'Primary care workforce shortages: Nurse practitioner scope-of-practice laws and payment policies' *NIHCR Research Brief No. 13*. National Institute for Health Care Reform: Washington, DC.

37. Gruen RL, SD Pearson and TA Brennan (2004) 'Physician-citizens—public roles and professional obligations' *JAMA* 291(1):94-98.

38. Kyle MK and DB Ridley (2007) 'Would greater transparency and uniformity of health care prices benefit poor patients?' *Health affairs* 26(5):1384-91.

39. Franco LM, S Bennett and R Kanfer (2002) 'Health sector reform and public sector health worker motivation: A conceptual framework', *Social science and medicine* 54(8):1255-66.

40. Kringos DS, WG Boerma, J van der Zee and PP Groenewegen (2013) 'Political, cultural and economic foundations of primary care in Europe', *Social science & medicine* 99:9-17.

41. Canadian Health Services Research Foundation (2012) *The economic impact of Improvements in primary healthcare performance.* Canadian Health Services Research Foundation: Ontario.

42. Epstein L, J Gofin, R Gofin and Y Neumark (2002) 'The Jerusalem experience: Three decades of service, research, and training in community-oriented primary care', *Am J public health* 92(11):1717–21.

43. Safran DG, M Kosinski, AR Tarlov, WH Rogers, DA Taira et al. (1998) 'The primary care assessment survey', *Medical care* 36(5): 728–39.

44. Schafer W, Boerma W, Kringos D, De Maeseneer J , Greß S, Heinemann S, Rotar-Pavlic D, Seghieri C, Svab I, Van den Berg, M, Vainieri M, Westert G, Willems S, Groenewegen P (2011) 'QUALICOPC, a multi-country study evaluating quality, costs and equity in primary care', *BMC family practice* 12(1):115.

6.2 Further references (relevant background/in discussion text)

Cheng T and B Solomon (2013) 'Translating life course theory to clinical practice to address health disparities', *Matern child Health* J: 1–7.

De Savigny D and T Adam (2009) *Systems thinking for health systems strengthening*, Alliance for Health Policy and System Research and WHO, Geneva.

Delnoij D, G Van Merode, A Paulus and PP Groenewegen (2000) 'Does general practitioner gatekeeping curb health care expenditure? *J Health Serv Res Pol.* 5(1):22-26

Gilson L, J Doherty, R Loewenson and V Francis (2008) *Challenging inequity through health systems.* Final report of the Knowledge Network on Health Systems, WHO Commission on the Social Determinants of Health. Johannesburg: Centre for Health Policy, EQUINET, London School of Hygiene and Tropical Medicine: London. http://www.who.int/social_determinants/resources/csdh_media/hskn_final_2007_en.pdf

Gruber J (2010) 'The cost implications of health care reform', *New England Journal of Medicine* 362:250–55.

Kringos DS, WGW Boerma, Y Bourgueil, T Cartier, T Hasvold et al. (2010) 'The European primary care monitor: Structure, process and outcome indicators', *BMC Fam Pract* 11:81.

Kringos DS, WGW Boerma, J Van der Zee and PP Groenewegen (2013) 'Europe's strong primary care systems are linked to better population health, but also to higher health spending', *Health affairs* 32(4):686-94. doi: 10.1377/hlthaff.2012.1242

Loewenson R and M Whitehead (2012) 'Robust and equity oriented health systems', WHO European Office for Investment for Health and Development, Venice.

Loewenson R (2014) Analysis of databases on country performance on health expenditures and outcomes, TARSC

Loewenson R, Simpson S, Nolen A (2014) Synthesis and analysis of evidence on promising primary care practice: Learning from high and middle income countries to address challenges and opportunities in the USA, TARSC

Macinko J, B Starfield and L Shi (2003) 'The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970–1998',. *Health serv res.* 38(3):831–65.

Molla S, Yordy KD, Lohr KN, Vanselow NA (1996) 'Primary care: America's health in a new era', Committee on the Future of Primary Care. Institute of Medicine: Washington, DC.

Nolen A (2014) Primary care in the United States of America Health System: Literature review of strengths, weaknesses and opportunities for improved health outcomes, UTMB, TARSC

RWJF (Robert Wood Johnson Foundation) (2009) 'Beyond health care: New directions to a healthier America, recommendations from the Commission to Build a Healthier America', RWJF: New York.

RWJF (Robert Wood Johnson Foundation) (2012) 'Advancing primary care: Opportunities to support care delivery redesign in practices serving medicaid and racially and ethnically diverse patients' RWJF: New York.

Shi L, B Starfield, B Kennedy and I Kawachi (1999) 'Income inequality, primary care, and health indicators", *J Fam Pract* 48:275–84.

Simpson S (2014) Desk review of key features of promising Primary care practices in middle- and high-income countries, TARSC

World Health Organisation (WHO) (2000). *World Health Report: Health Systems Improving Performance.* WHO: Geneva.

WHO (2013) 'Primary health care, including health system strengthening'. Report by the Secretariat to the Sixty-Second WHA A62/8. WHO: Geneva

White J and Marmor M (2009) Primary Care and Health Reform-Concepts.Confusions and Clarifications in Marmor M et al (ed) Comparative Studies and the Politics od Modern Medical Care, Yale University Press USA pp180-202

Appendix 1:

Search methods and decisions on papers

The initial search was undertaken using PubMed and ISI Web of Science databases. The PubMed searches were repeated on Web of Science (ISI). No time or language limits were applied to the searches. Results for search terms are below:

Table 4a: Search terms and results in Pubmed and ISI Web of science in all fields (Pubmed) and the topic field (ISI)

Search terms		PubMed	ISI
i.	(Primary care) AND (strength)	n = 1613	n = 849
ii.	(Primary care) AND (health system) AND (outcome*)	n = 342	n = 250
iii.	(Primary care) AND (contribution) AND (health outcome)	n = 1	n = 3
iv.	(Primary care) AND (framework) AND (better health)	n = 5	n = 5
v.	(Primary Care) AND (health outcome*)	n = 84	n = 91

Both investigators reviewed all the papers for inclusion/ exclusion by assessing their content against the five domains for PC identified in the project proposal: (i) context; (ii) PC service delivery (iii) public/social roles (iv) outcomes and (v) change management. Abstracts for the first set of search terms in *Table 4a* on both PubMed and Web of Science were reviewed separately and entered into an automated referencing system. While reviewing, the abstracts were checked for the presence of frameworks and evaluative tools or studies, as a form of verification for the search terms. Duplicates were removed, leaving 138 articles. The abstracts of these articles were reviewed, 32 were excluded and the remaining 105 were categorised as in *Table 4b overleaf.*

From this search 9 articles (Harzheim et al., 2006; Kates et al., 2012; Kringos et al., 2013, 2010a, 2010b; Macinko et al., 2003; Shi et al., 1999; Starfield and Shi, 2002; Stenger et al., 2012) were identified as directly relevant to a framework for or assessment of PC tool.

Further papers were sourced as below:

- The PubMed & ISI search results were checked against the generic literature search done for the project (September 2013), using similar search terms but more expanded using -- (primary care OR primary health care) AND (system OR service OR patients OR health workers OR family doctors OR nurse practitioners OR general practitioners) AND (chronic diseases OR non-communicable diseases OR risk factors) AND (monitoring OR evaluation) AND (equity OR effectiveness OR efficiency OR continuity OR low cost) AND (best practice OR good practice or promising practice) -- and largely time limited to 2000+ and English language articles, to see if there were any additional or different papers and to verify if key papers in the set identified as directly relevant to a framework for or assessment of PC tool were included. This search used the following databases (PubMed, GoogleScholar, EAGLE OpenSIGLE), as well as snowballing from references of entered articles and articles found in the grey literature searches

- Additional papers were identified for inclusion from the existing literature on primary care in Europe, including the WHO European briefing on the advantages and disadvantages of primary care.

- The OECD website pages on the Health Care Quality Indicators project were reviewed, as this was cited as used in major PC studies and identified in the September 2013 literature search. From this three key references were identified for inclusion, viz: a conceptual framework, and a paper related to development of indicators for PC and PC quality of health promotion, prevention and primary care (Kelley and Hurst, 2006; Mattke et al., 2006).

- A search of the Health Systems Evidence (HSE) database using the same searches as for PubMed yielded four further papers and three that were already included. For the HSE search on PC plus Effective/ best plus practice, 614 articles were identified but

HSE only makes 50 records available. Due to time constraints, we only included those studies that were available and reviewed and from this three further articles were included.

- Snowballing from other sources identified a chapter on primary care and performance management (Lester and Roland, 2009).

- In the process of reviewing the papers, both investigators added further information on the content of the domains to develop a matrix for the literature review. Snowballing from the references of the initial 24 papers identified an additional 15 papers.

- Abstracts of 37 papers identified by the US peer reviewer of the draft framework were reviewed and a further two papers included as relevant to frameworks (vs studies of specific sites or settings).

- A structured search of the Center for Health Systems Change, Commonwealth Health Fund, Kaiser Family Foundation websites and Rand Foundation were undertaken using the search terms shown in *Table 4a*. A review of the abstracts by PI1 and PI2 showed that the studies largely implemented in specific countries or settings verified many of the constructs selected for the framework, with four more papers selected for new information on workforce practices.

- Six more papers were identified by external peer reviewers and reviewed and four were included.

Table 4b: Categorisation of papers identified in the search

Area of work	Categorisation	Decision
1. Primary care frameworks and evaluation tools/ approaches	1a. Directly relevant e.g. framework or PC assessment tool	Included in first sets to be reviewed
	1b. Indirectly relevant - commentary/ making the case for the value of PC	Included for review in second round of development
	1c. Indirectly relevant/directly relevant - markers/ indicators or measures for primary care	Included to be used in the first round of development of the framework in case set 1a highlighted relevance and or in case of absence of information
	1d. Country studies, results etc. For example, review of PC in Baltic countries, 7 attributes of PC in Thailand	Included to be used in the first round of development of the framework in case set 1a highlighted relevance and or in case of absence of information
Models of primary care	2a. Patient-centred medical home and related models	Identified as potential sources of information but excluded from category 1 and priority set of articles because not directly relevant to or including frameworks. However, noted because of future relevance to other tasks in the project and for background information.
	2b. Chronic disease as an entry point	
	2c. Financing	
Other aspects of primary care	3a. Electronic health records	
	3b. US-specific contextual factors	
	3c. PC practitioners	
	3d. Vulnerable gps, social disparities	
	3e. Quality	
	3f. Team work and composition	
4a. Implementation issues	Such as change management and or change management in a US context	

Table 5. References reviewed for the framework

Reference (see 6.1 for full references)	Identified how	Reason for inclusion
1. Harzheim, et al 2006.	PubMed and Web of Science lit search(es).	Include: It uses the PCATool (Starfield PC assessment tool for adults), and has elements that link to the five domains.
2. Kates, N., Hutchison, B., O'Brien, P., Fraser, B., Wheeler, S., Chapman, C., 2012.	PubMed and Web of Science lit search(es)	Include: Innovative and different way to other frameworks/ tools and features of primary care. Raises 6 characteristics of (a) high-performing PC system similar to process/practice characteristics of PC defined by Kringos/Starfield Also discusses system/structural characteristics needed to enable high performance useful in understanding processes for transforming PC.
3. Starfield, B., 1991.	Snowballing/from literature (eg. Starfield et al 2005)	Include: Early version of framework concepts for structural and practice characteristics.
4. Starfield, B., 1994.	Snowballing/from literature (eg. Starfield et al 2005)	Include: Advancement on 1991 paper but uses same data. NB: also refers to "great voids" in knowledge about the actual effect of other health system features of care that are related to PC practice and notes that the differences between countries in these characteristics are greater than the similarities.
5. Kringos, D., et al 2013.	PubMed and Web of Science lit search(es)	Include: useful in thinking through the tool/framework and its elements. Used in cross country reviews ,
6. Starfield, B., Shi, L., Macinko, J., 2005.	PubMed and Web of Science lit search(es)	Include: Provides important additional references plus "evolution" or history of the different frameworks and concepts. Critical piece.
7. Starfield, B., Shi, L., 2002.	PubMed+ Web of Science lit search	Include: builds on previous studies & some useful information in it.
8. Macinko, J., Starfield, B., Shi, L., 2003.	PubMed and Web of Science lit search(es)	Include: Useful for comparing against areas for the framework. Builds on earlier tools by Starfield. Uses one measure for each of the structural characteristics and practice features, and sum all 10 variables in a composite indicator
9. Kelley, E., Hurst, J., 2006.	Search of OECD website snowballing from HCQI project and Kringos et al	Include: Useful information and linkages to Starfield and Kringos et al studies or approaches.
10. Mattke, et al , 2006.	Search of OECD website snowballing from HCQI project and Kringos et al	Include: some useful info for the framework from it.
11. McMurchy, D., 2009.	HSE search.	Include: referenced in Kates et al and contains a significant amount of information for use in the framework/table.
12. Brennan, et al 2012.	HSE search	Include: and used in framework.
13. Stigler et al 2013.	PubMed + Web of Science lit search	Include: used but applies Starfield framework included earlier.
14. Stenger,et al . 2012	PubMed + Web of Science lit search	Include: used, very helpful on models and broader engagement in development front.
15. Lester, H., & Roland, M. (2009).	Opportunistic identification	Include: used first and second chapters. (Second chapter on Chronic Care by McKee et al).
16. Polluste, et al 2013	PubMed and Web of Science lit search(es)	Include: used for specific indicators. Uses the PHAMEU framework already described in Kringos, D et al 2013
17. Kitreerawutiwong, et al . 2010	PubMed, Web of Science lit search	Include: useful approach and indicators
18. Kruk ME, et al 2010	Previous search and HSE search.	Include: Critical review of PC within primary health care – imp overview of studies; equity dimension.
19. Pasarín MI, , et al 2013	Snowballing.	Include: noting it applies the PCAT Starfield already covered, some info on adaptation in Spain.
20. Haggerty JL et al , 2008	Snowballing	Include: Highlights key PC practice issues.
21. Russell G, et al 2010	Snowballing	Include: Highlights key PC practice issues.
22. Health Council of the Netherlands. 2004	Snowballing/from literature (eg. Starfield et al 2005)	Include: Key historical document in development of PC field in past 20 years, provides imp overview of issues considered by countries.

Reference (see 6.1 for full references)	Identified how	Reason for inclusion
23. Kringos, D. S., Boerma, W. G. W., Hutchinson, A., van der Zee, J., & Groenewegen, P. P. 2010	PubMed and Web of Science lit search(es)	Include: Extensive literature review for PC measurement & assessment tool, imp foundational work.
24. Oldroyd J, et al (2003)	From literature search for project proposal.	Include: Important insights into how PC practitioners see chronic care & incentives or not for working on it, particularly in solo practices.
25. Villalbí JR, et al (2003)	From literature search for proposal.	Include: Builds on Starfield PCAT tool
26. Robert Wood Johnson Foundation (2012)	Identified in literature search for project proposal.	Include: Provides examples of how to support PC practices to work with diverse communities eg. alliances and regional coalitions.
27. Robert Wood Johnson Foundation: 2012.	Snowballing/from literature	Include: relevant to USA setting and on change management and innovation.
28. Ohman-Strickland PA et al : 2007	Snowballing/from literature	Include: has information on attributes relevant to change in PC practice.
29. WHO Regional Office for Europe. (2010).	From literature search for proposal.	Include: key tool being used by WHO Regional office for Europe in working with countries.
30. Thorlby R (2013)	From literature search for proposal.	Include: broader population health perspective.
31. JHSPH. Primary Care Assessment Tools. 2010	From literature search for proposal.	Include: publicly available version of PCAT.
32. McDonald, J, et al. (2006).	From literature search for proposal.	Include: Australian analytic model
33. Health Systems in Transition series. (n.d.).	Snowball search of related websites -	Include: Cross country analysis
34. O'Malley, A. S., Samuel, D. R., Bond, A. M., & Carrier, E. (2012).	Snowball search of related websites -	Include: Most recent paper in series on elements of continuity of care
35. The Commonwealth Fund. (2013).	Snowball search of related websites -	Include: Cross country analysis
36. Yee, T., Boukus, E. R., Cross, D. A., & Samuel, D. R. (2013).	Snowball search of related websites -	Include: Recent paper in series on factors in scope of practice
37. Gruen, R L, Pearson, S D, Brennan, T A 2004,	US reviewer	Include: definition and a conceptual model of public roles
38. Kyle, M K & Ridley, D B 2007	US reviewer	Include: review of effects of price transparency and costs
39. Franco, L M, Bennett, S, & Kanfer, R 2002	US reviewer	Include: information on workforce and change management
40. Kringos, D.S, et al 2013	Snowball search of related websites -	Include: information on health expenditure and PC
41. Canadian Health Services Research Foundation. 2012.	Peer reviewer	Include: Information on economic and health outcomes measurement
42. Epstein L, Gofin J, Gofin R, Neumark Y. 2002	US reviewer	Include: COPC relevant to population focus and prevention
43. Safran DG, et al . 1998	Peer reviewer	Include: example of patient focused quality improvement tool.
44. Schafer W, etal. . 2011	Peer reviewer	Include: outlines QUALICOPC study framework.

Appendix 2:

Indicators and proxy measures for areas of the framework

The indicators in this list derive from the references shown in Section 6.1 and from review of international data (Loewenson 2013), with databases referenced by letter according to the key below

A. World Development Indicators database 2013
B. European Observatory on Health Systems and Policies (EOHSP) (2013)
C. OECD (2013) OECD Online Database:
D. World Health Statistics 2013

CONSTRUCTS (factors In the domains)	PROXY MEASURES/ INDICATORS *As found in the literature and the database work.* Many areas assessed also through qualitative evidence	SOURCE: # in Sec 6.1 and key
DOMAIN 1: CONTEXT/ SYSTEM/STRUCTURAL		
Socio-political, cultural and economic context		
National socio-political context	Demographic profile % and male/female distribution of elderly people Population growth Population (Total, % female, male) Population % total -0-14yrs; 15-64ys; Completeness of birth registration Population 65+ as % total Age dependency ratio : 65+ as % working-age population and <16 as % of working-age population Life expectancy at birth, total (years) Fertility rate, total (births per woman) Survival to 65yrs %male/ female cohort CPIA gender equality rating CPIA policy and institutions for environmental sustainability rating Internet users (per 100 people) Rural population % of total	8,12,1,37 All from (A)
National economic context	% income in top to bottom 10% GDP/Capita, Gini coefficient Poverty rates, indices of deprivation; Rurality index Coverage of social protection GDP/capita (constant 2005 US$) GDP/capita growth (%) General government final consumption exp as % GDP Tax revenue as % GDP; % total Taxes on - income, profits and capital/goods and services Total debt service as % of GNI Depth of the food deficit Employment to pop ratio, 15+, total; Vulnerable employment % total Adjusted net national income; GINI index; Income share held by highest and lowest 10% CPIA social protection rating Poverty % pop at $2 a day (PPP); Poverty gap at $2 a day (PPP) (%) % benefits held by 1st 20% population % coverage all Social Insurance; Generosity of All Social Safety Nets Primary completion rate; Progression to secondary school Public spending on education % GDP	5, 7 4,5,6,7, 21 All from (A)

CONSTRUCTS (factors In the domains)	PROXY MEASURES/ INDICATORS *As found in the literature and the database work*. Many areas assessed also through qualitative evidence	SOURCE: # in Sec 6.1 and key
National health context	Health profiles; Disease prevalence by key groups Frequency, causes of hospitalisation Prevalence undernourishment (% pop) Malnutrition prevalence % <5 yrs: weight for age/height for age Smoking prevalence % females, males HIV Prevalence, % of pop 15-49 yrs CO_2 emissions from manufacturing industries and construction (% of total fuel combustion)	1,4, 6, 8,33 All from (A)
Health system context		
Policy; extent of a national PC orientation	Qualitative content analysis CPIA policies for social inclusion/equity cluster average	A
Laws	Qualitative content analysis	
Governance/ stewardship of the health system and PC system;	Dialogue processes mechanisms for developing policies, standards/ guidelines for and monitoring of PC practice, including between national and subnational levels; Share of public participation on central, regional boards Presence of a unit for PC at central level; CPIA public sector management and institutions cluster average	5, 11, 14,16, 22, 29, 32 A
Organisation of the health and PC system	See financing, workforce and other indicators	
Financing of Health system and of PC system	Health expenditure per capita PC expenditure per capita (although noted to be unreliable due to different definitions) Govt, insurance, OOP as share of total health expenditure Health insurance coverage Co-payment levels relative to incomes; Administration as % total health expenditure Hospital vs PC spending External resources for health as % total expenditure on health Out-of-pocket (OOP) health expenditure as % total/private expenditure on health Health expenditure per capita, PPP (constant 2005 international $) Health expenditure, private % GDP Health expenditure, public as % GDP/total health expenditure/ government expenditure) Health expenditure, total as % GDP Growth in Total health expenditure/capita	3, 4, 5,6, 8, 11, 16, 18, 23, 29, 32, 35, 36 A, C
Workforce development and regulation	Age, sex distribution of PC workforce % and age/sex distribution of GPs /physicians in employment Number of undergraduate curricula/ professional development programmes supporting PC skills	2, 5, 6, 7, 8, 13, 16, 23, 34
DOMAIN 2: PC SERVICE DELIVERY/ MODEL OF CARE/ MODE OF PRACTICE/ PROCESS		
Service inputs		
Workforce density, training, type and capacities	PC workforce type/1000 population Ratio GPs to specialists Paediatricians/ 1000 population % active physicians who are specialists Community health workers /1,000 people Nurses and midwives/1,000 people Physicians/1,000 people	2, 3, 4, 6, 9, 11, 13, 23, 34, 41 A
Workforce organisation, provider teams and *collaboration*	% GPs/ PC physicians/PC personnel who are satisfied with their work and work requirements	1, 2, 5, 11, 12, 14, 23, 24, 32, 34, 36
Workforce incentives	Income of PC physicians relative to specialists Income (and sex disaggregated income) of PC workers Reported job satisfaction (for different cadres) % Physician satisfaction with their practice	2, 5, 6, 11, 12, 21, 32, 39 B

CONSTRUCTS (factors In the domains)	PROXY MEASURES/ INDICATORS *As found in the literature and the database work*. Many areas assessed also through qualitative evidence	SOURCE: # in Sec 6.1 and key
Medicine, technology. infrastructure	Medications per capita Hospital beds (per 1,000 people)	4, 5, 7, 9, 11, 14 A
Service content		
Person centred, Needs based first contact	Share of patients self-referred by care level % patients who have a usual source of PC Risk, duration, effects of acute/ chronic health conditions	2, 4, 6, 8, 13, 20, 21, 23, 30, 34 41
Prevention focus: health promotion, public health	Breadth and uniformity of preventive services in the benefits covered No of referrals for non-medical interventions e.g. exercise classes	2, 4, 5, 6, 10, 11, 14, 22 23, 30
Public health integration	Improved sanitation facilities (% of population with access) Tuberculosis case detection rate (%, all forms)	A
Personal care services: curative, rehabilitative, emergency; incl. for chronic conditions	Level of avoidable hospitalisation Frequency of home visiting (direct and through electronic contact) Level of emergency and hospital use for ambulatory care sensitive conditions Chronic disease outcomes Level of client adherence, compliance	4, 5, 6, 7, 8, 11, 14, 15, 23, 24, 32
Service organisation/ process attributes		
Longitudinal continuity- person focused care over time	Waiting times Unmet care needs Completeness and portability of patient access, records Contraceptive prevalence (% of women ages 15-49) Wanted fertility rate (births per woman) Unmet need for contraception (% of married women ages 15-49) Pregnant women receiving prenatal care (%) Waiting times Occupancy rates in acute care hospitals	2, 3, 4, 5, 8, 9, 11, 13, 14, 17, 20, 21, 23 A, C
Relational (or interpersonal) continuity	Duration of relationship with PC provider Waiting times Availability and type of after hours service Teenage mothers (% of women ages 15-19 who have had children or are currently pregnant) Pregnant women receiving prenatal care (%) % reporting for treatment, and % filling prescriptions	3, 5, 6, 7, 11, 13, 17, 22, 23, 34 A
Informational continuity	Presence of guidelines for information transfer	4, 5, 6, 8, 11, 13, 14, 17, 29
Co-ordination of services	Number of other health care establishments with which the PC provider has formal, operational agreements Presence of occupational and physical therapists in PC services Availability of 24/7 telephone access Tuberculosis case detection rate (%, all forms)	2, 3, 5, 9, 13, 14, 15, 20, 22, 29 A
Collaboration between PC and other levels of care ; referral	*Reduced emergency service visits and hospitalization* *Reduced acute , avoidable hospitalizations* Level of overtreatment Patient satisfaction with gatekeeping role	5, 6, 8, 11, 44 2, 6, 8, 11, 14, 44
Innovation		2, 22, 32
Service features		
Availability	Service density Gap analysis of services relative to population, health needs indicators	5, 20, 23
Comprehensiveness; patient –centredness, holistic care	Positive or negative list Level of appropriate/inappropriate treatment Availability of and distance to other options for care	4, 5, 8, 11, 13, 14, 17, 21, 29

CONSTRUCTS (factors In the domains)	PROXY MEASURES/ INDICATORS *As found in the literature and the database work*. Many areas assessed also through qualitative evidence	SOURCE: # in Sec 6.1 and key
Access/ accessibility and equity	*Level of OOP* *Percent of secondary care users with no prior PC visit* Access to first contact by social group Share of co-payment at PC Workforce density by area Outreach/home visits per week Unmet healthcare needs Earlier stages of detection of cancers Tuberculosis treatment success rate (% of registered cases) Tuberculosis case detection rate (%, all forms) Wanted fertility rate (births per woman) Unmet need for contraception (% of married women ages 15-49) Pregnant women receiving prenatal care (%) Births attended by skilled health staff (% of total) Confidence to afford care	1, 4, 5, 7, 8, 11, 13, 14, 18 16, 17, 18, 23, 29, 30, 41 A
Service quality	Outcomes of specialist procedures through PC referral vs direct /self-referral Levels of unnecessary intervention Range of diagnoses for which follow up care provided at PC level	2, 4, 7, 11, 14, 23, 26, 27, 32
Service effectiveness, appropriateness safety	Diagnostic tests per patient Tuberculosis case detection rate (%, all forms)	2, 14, 1, 15 8, 9, 11 A
Service costs and efficiency ' better value'	Specific health outcomes/ per capita PC expenditure Share of waste in health care expenditure Share of inappropriate treatments	2, 9, 14, 18, 23
Trust, supportive relations within the system	Level of adverse effects and medical errors % Physician satisfaction with their practice	6, 12, 41 B
DOMAIN 3: PUBLIC/ SOCIAL ROLES		
PC System interface with society		
Population, community orientation of PC services	Tuberculosis case detection rate (%, all forms)	A
Client – centredness, responsiveness involvement % accountability	Patient's report of her or his experience of care Early detection of risk of child abuse Doctor visits per capita Quality audits; financial audits Level of denial of care Earlier detection of cancer	1, 2, 5, 6, 7, 8, 9, 11, 12, 14, 15, 17, 38, 41
Family- centredness involvement		
Features of society in PC systems		
Social and client health literacy, roles, empowerment	**Availability of health education materials at PC** **health literacy level** **Community consultation mechanism.** **Level of awareness of patient rights**	2, 11, 14, 17, 18, 22
Social and client choice and trust	**Client adherence to appointments** Unmet need for contraception (% of married women ages 15-49) Teenage mothers (% of women ages 15-19 who have had children or are currently pregnant)	1, 2, 4, 6, 9, 12, A

CONSTRUCTS (factors In the domains)	PROXY MEASURES/ INDICATORS *As found in the literature and the database work*. Many areas assessed also through qualitative evidence	SOURCE: # in Sec 6.1 and key
DOMAIN 4: OUTCOMES		
Health service outcomes		
Acceptability; responsiveness; adherence, 'better care'	Waiting times Acute episodes/ recurrence Frequency of repeat hospitalisation Level of admission for preventable conditions Tuberculosis treatment success rate (% of registered cases) Wanted fertility rate (births per woman) Teenage mothers (%15-19 who have had children/currently pregnant) Age standardised level of insufficient activity in adults % reporting for treatment; % filling prescriptions Occupancy rates in acute care hospitals	1, 2, 3, 6, 11, 16 A, C, D
Coverage/utilisation rates	Acute hospital admissions Coverage/ utilisation rates for specific conditions/social gps Unmet need for contraception (% of married women ages 15-49) % pregnant women receiving prenatal care Births attended by skilled health staff (% of total) Immunization, measles (% of children ages 12-23 months) % Tuberculosis case detection rate	6, 18, 41 A
Health status outcomes		
Health status, 'better health'	*Neonatal mortality, post neonatal mortality;* *Potential years of life lost* IMR, Under 5 year mortality; age adjusted and SMR LE age 1; LE age 20; LE age 65; birth-weights <2500g Mortality- Cancer related; CHD related; Cervical cancer; Lifetime risk of maternal death (%) Under-5; infant and neonatal mortality/1,000 live births) Low-birthweight babies (% of births) Maternal mortality ratio/ 100 000 live births: modelled/national est Prevalence overweight % <5yr olds Incidence of tuberculosis/100,000 pop Adult Mortality/1000 adults; % Survival to age 65 by sex % with Self reported good health by income quintile % Raised blood pressure in adults Age standardised mortality rates/100 000 for NCDs, diabetes, CVD	1, 2, 3, 4, 6, 7, 11, 18 A, C, D
Health equity outcomes		
Financial protection; and equity in financial burdens	OOP spending; Catastrophic spending Per capita expenditure on elderly OOP health expenditure as % total/private expenditure on health Tuberculosis case detection rate (%, all forms) % Income spent on health care	4, 11, 18 A, B
Health inequalities; access;	Child survival equity Inequalities across regions, social groups in access, financing, quality, health outcomes CPIA equity of public resource use rating	5, 7, 8, 18 A
DOMAIN 5: MANAGING AND SUSTAINING CHANGE		
Organizational and leadership roles, resources competencies;		
Transformational/ transactional skills and processes.	Funding of PC research- amount, purpose, length of time of grants	2, 11, 12, 22, 26, 27, 28, 39
Use of information and monitoring systems	Availability of reports on performance. Frequency of financial audits	2, 4, 5
Supportive systems- Embedding PC in wider system changes	Recognition system for improving and or best PC practices – non-financial incentives in place	8, 36, 39