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# Informing the development of a resource allocation framework in the German healthcare system

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# Preface

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This report provides the National Association of Statutory Health Insurance Physicians (*Kassenärztliche Bundesvereinigung*, KBV) in Germany with an overview of quality indicators and approaches that are currently used for ‘high stakes’ assessment in a range of countries in Europe and elsewhere and so inform the development of the quality component of a proposed national resource allocation framework in the German statutory healthcare system.

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# Summary

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In the German statutory health insurance (SHI) system, the payment of office-based physicians in the ambulatory care sector is based on a complex system involving national and regional stakeholders. Payment rates are derived from a national relative value scale but, as budgets are negotiated at the regional level, conversion factors for the relative values and thus prices for the same service can vary by region. In a move towards a simplified and comprehensible approach that adequately represents services provided in the ambulatory care sector, the government has asked the Valuation Committee (*Bewertungsausschuss*) for a proposal for the gradual convergence of payment based on nationally uniform prices.

Against this background, the National Association of Statutory Health Insurance Physicians (*Kassenärztliche Bundesvereinigung*, KBV), member of the Valuation Committee, is looking to develop a national approach that allocates funds according to a unified framework, while taking account of regional characteristics. As part of this new approach, the KBV seeks to incorporate quality indicators into the allocation formula so as to improve the overall quality of care provided by SHI physicians. This report aims to inform the development of the quality component of the proposed national resource allocation framework in the German statutory healthcare system by providing an overview of quality indicator systems and quality measurement approaches, including criteria for selecting measures of quality currently used for ‘high stakes’ assessment in high-income countries globally. High stakes uses of performance measures mean that the provider’s performance scores are used for public accountability (making results transparent through public reporting) and/or for differentially allocating resources (pay-for-performance or P4P).

## Defining good quality care

The operationalisation of healthcare quality ranges from simple approaches such as Donabedian’s seminal ‘structure–process–outcome’ classification to complex, multiple-domain frameworks. The most common domains relate to effectiveness, efficiency and access, followed by patient focus and related concepts, and patient safety. On the basis of published frameworks we propose nine domains of healthcare quality for consideration by the KBV:

1. *Screening/primary prevention*: Strategies aimed at preventing the development of a disease (e.g. immunisation) (primary prevention) or the testing of a symptomless population in order to detect cases of a disease at an early stage (screening).

2. *Access/availability*: Extent to which services are available and accessible in a timely manner.
3. *Clinical effectiveness*: Extent to which a service achieves the desired result(s) or outcome(s) at the patient, population or organisational level.
4. *Safety*: Extent to which healthcare processes avoid, prevent and ameliorate adverse outcomes or injuries that stem from the processes of healthcare itself.
5. *Efficiency*: Relationship between a specific product (output) of the healthcare system and the resources (inputs) used to create the product.
6. *Equity*: Extent to which the distribution of healthcare and its benefits among a population is fair; equity implies that, in some circumstances, individuals will receive more care than others to reflect differences in their ability to benefit or in their particular needs.
7. *Comprehensiveness/coordination*: Extent to which a range of services is provided that is broad enough in scope and depth and/or continuous, integrated and organised to meet service user needs.
8. *Patient experience*: Extent to which the patient perspective and experience of a service is measured and valued as an outcome of service delivery.
9. *Management/organisation*: Extent to which management processes are in place to deliver on the above domains of quality.

### **Criteria for selecting indicators for ‘high stakes’ applications**

If quality measurement is to guide quality improvement, indicators should meet certain criteria based on the evidence that taking a particular action leads to some desired outcome, such as lower morbidity or mortality. However, quality measures are frequently selected on the basis of what is available and practical (‘measurable’), and the extent to which these reflect the quality of healthcare, or indeed their implications for policy, often remains unclear.

Of the range of desirable attributes of quality indicators that have been proposed we suggest adapting those maintained by the US National Quality Forum, which are used widely:

- *Importance*: Does the indicator provide information on a topic of relevance to decisionmakers?
- *Scientific soundness*: Does the indicator capture the underlying construct in a reliable and valid way, and is it based on evidence or solid professional consensus?
- *Feasibility*: Is it possible to collect data for the indicator with reasonable effort?
- *Usability*: Can the indicator provide actionable information for decisionmakers?

### Indicators in current use

We reviewed 18 quality measurement systems that are being used by a variety of public and private organisations in six countries, with one pan-European indicator system added. From these we extracted 826 quality or performance indicators that we attributed to at least one of the nine domains of quality guiding this work.

The key findings of our review are:

- *The majority of quality indicators being used in 'high stakes' applications address clinical effectiveness and there were few measures of efficiency and equity.* The relative weight assigned to the indicator domains varied by organisation and country; for example, while clinical effectiveness indicators are represented in all systems their proportion varies between 19% (Australia) to over 60% (Sweden, US) of all indicators. Screening/primary prevention indicators are represented in most systems, accounting for between 16% (Australia, Canada) and 26% (New Zealand), while indicators on access/availability form an important component in Australia, Canada and Sweden only. Indicators of patient experience and patient safety are less common and indicators of coordination, efficiency and equity are rarely used. This is mostly because there is a lack of appropriate indicators in these domains.
- *What is being measured within certain domains is highly variable, reflecting differences in the importance that is attached to different diseases and conditions.* For example, access, whether in relation to specific services and/or by specific population groups, is a high policy priority in a number of countries, including Australia, Canada, New Zealand and Sweden.
- *Measurement focuses on common and well-defined conditions with a solid evidence base, such as heart disease and diabetes.* In clinical areas where the evidence base for clinical management is not as well developed and there is less consensus on the management of the condition, indicator development is more difficult; consequently, these areas remain underrepresented. An example is mental health, with the possible exception of depression. The tendency to focus on what can be measured is problematic in 'high stakes' assessment, such as P4P schemes, as it may divert attention from areas not covered by indicators, irrespective of their clinical importance.
- *Indicators tend to focus on what should be done rather than on what should not be done.* We consider this a significant weakness in the current state of performance measurement systems, especially as overuse of medical procedures is a significant problem in many countries. Better evidence-based criteria to identify areas of overuse of care are needed.
- *Local priorities, perceptions of problems and political factors drive priority setting.* In Canada and Sweden there is great concern about waiting times for treatment. In New Zealand, there is concern that Māori and Pacific Island populations do not have fair access to medical care. Systems in the US and England/the UK tend to emphasise indicators of clinical effectiveness. Because of the higher penetration of electronic medical records, clinical effectiveness indicators in England/the UK are more detailed, so they can track intermediate outcomes such as blood pressure and cholesterol levels and whether counselling was provided to the patient. In other countries there is a

stronger emphasis on tracking whether the right process of care was delivered (e.g. whether those with diabetes were given an HbA1c test). This suggests that it will be important for the KBV to tailor a German framework for quality indicator selection that is based on both German priorities and the particularities of Germany's delivery system, which includes the type of data available to construct a performance measure.

### **Quality indicators in resource allocation in Australia, Canada, England and New Zealand**

The use of quality or performance indicators in 'high stakes' assessments mostly takes the form of accountability frameworks that involve public reporting, including systems that use quality indicators as part of pay for performance schemes.

Operating at national (Australia, England, New Zealand) or regional level (Canadian provinces), the accountability frameworks reviewed vary in nature, scope and level of implementation. However, with the possible exception of Ontario's Cancer System Quality Index (CSQI), there is little documented evidence of the impact of the public reporting systems identified here. Evaluation of the CSQI noted that because it included clinicians in indicator selection and reports publicly only on indicators that have been used internally for a number of years, it has encouraged change by identifying quality gaps.

This is in contrast to the use of quality indicators as part of pay for performance (P4P) schemes operating in Australia, England/the UK and New Zealand. These include the Practice Incentives Program (PIP) in Australia, which offers financial incentives for general practices to support quality care and so improve access and health outcomes; the Quality and Outcomes Framework (QOF), a P4P scheme for general practice in England and the UK; and the Primary Health Organisation (PHO) Performance Management Programme in New Zealand, which provides PHOs with additional funding for achieving a range of national indicators.

There is evidence of impact for all three schemes, including increased adoption of electronic records and/or transfer systems, facilitated by support structures at a regional level (Australia: divisions of general practice) or a national level (national IT system for the automated extraction of data in England/the UK). There were also documented improvements in care processes for major chronic diseases and effects in reducing health inequalities (England) or increased access for disadvantaged groups (Australia, New Zealand). However, perceived limitations included a potential mismatch between national priorities and local relevance of assessed indicators (New Zealand), and the potential for distortion. Experience in England in particular suggests there is no single approach that can be guaranteed to lead to a major improvement in quality. Indeed, it is likely that only a combination of multiple interventions sustained over time will improve quality.

### **Development of a quality measurement framework for Germany**

Based on our review, and taking account of the evidence presented in country case studies, we conclude that the development of a quality framework for Germany will depend on:

- data availability (and willingness to invest in data capture, such as through electronic medical records or dedicated data collection)

- regional and/or local perceptions of the priority areas for quality improvement
- societal norms, especially in relation to the relative importance of some aspects of care.

The work that has occurred in other countries to build quality measurement systems can inform decisions for Germany. Lists of indicators such as those reviewed here offer a range of possibilities to include in a framework for the KBV. There are also well-tested methods for combining evidence with local professional opinion to select quality indicators sensitive to the needs of individual countries. However, because of the importance of incorporating local priorities and local context, the work to develop a German framework has ultimately to be carried out in Germany, preferably with substantial input from German physicians and other stakeholders.

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The German healthcare system is largely funded through statutory health insurance (SHI) contributions from employers and employees, covering about 90% of the population, with the remainder covered by substitutive private health insurance.<sup>1</sup> Responsibility for the statutory system is shared by federal, 16 state (*Land*) and local authorities, and many tasks have been delegated to corporatist actors. The highest decision-making body in the SHI system is the Joint Federal Committee (*Gemeinsamer Bundesausschuss*, G-BA). It brings together the National Association of Statutory Health Insurance Funds (*GKV-Spitzenverband*) and the federal associations of healthcare providers (including physicians, dentists and hospitals), with patient representatives involved in an advisory role. Regulation of the healthcare system is embedded in legislation, set out in Social Code Book V (*Sozialgesetzbuch*, SGB V).

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

The National Association of Statutory Health Insurance Physicians (*Kassenärztliche Bundesvereinigung*, KBV) represents, at federal level, the interests of office-based physicians and psychotherapists in the SHI system. The KBV is the national association of the 17 regional associations of SHI physicians (*Kassenärztliche Vereinigung*, KV) in Germany (one in each of the 16 federal states, except for North Rhine-Westphalia, the most populated of the federal states, which is represented by two KVs). Membership in a regional KV is mandatory for physicians and psychotherapists to qualify for reimbursement through the statutory health insurance system ('SHI physicians').

The regional associations of SHI physicians contract with the regional associations of statutory health insurance funds and other parties. They negotiate a regional budget, which the KVs then disburse to the individual SHI physicians. Contracts with SHI fund associations cover almost all services provided by SHI physicians. Disbursement of funds is calculated from the regional budget (*Gesamtvergütung*) and the claims submitted by individual SHI physicians with payments disbursed quarterly. Services are paid on a fee-for-service basis, using a national relative value scale (*Einheitlicher Bewertungsmaßstab*, EBM), which is negotiated by the Valuation Committee (*Bewertungsausschuss*), formed by the KBV and the National Association of Statutory Health Insurance Funds. But as the

budget is set on a regional level, the monetary conversion factors and thus prices for the same service vary by region.

The payment of office-based doctors in the German statutory health insurance system has been subject to reform for some time. A recent proposal by the coalition government to reform the financing of the German SHI system emphasises the need to develop a simplified and comprehensible approach that adequately represents services provided in the ambulatory care sector while considering regional characteristics.<sup>2</sup> To this end, the government has asked the Valuation Committee for a proposal for the gradual convergence of payment based on nationally uniform prices by 30 April 2011, for consideration by Parliament in due course.

Against this background, the KBV is looking to change the current system and replace regionally negotiated budgets with a national approach that allocates funds according to a unified framework, moving towards annual, prospective regional budgets based on the needs of the population in the respective region. The proposed framework includes three components:

- need for care (based on morbidity, socio-demographic and structural factors)
- quality of care (access, patient satisfaction, efficiency etc.)
- target areas ('investment fund', targeted payments, e.g. R&D budget).

To further inform the second component of the newly proposed framework, the KBV is seeking to develop a set of quality indicators, which could be applied at regional level to relate a proportion of payments to quality and so provide an incentive to improve the overall quality of care provided by SHI physicians. One proposed dimension of 'quality' includes access, and there is a particular interest in identifying measures that help improve the currently uneven distribution of doctors between rural and urban areas. Further dimensions currently considered are measures of effectiveness (technical and interpersonal) and efficiency.

This report aims to inform the development of the quality component of the proposed national resource allocation framework in the German statutory healthcare system. The specific objectives are:

- to describe the components of 'good care'
- to describe criteria that could be used to select indicators for 'high stakes' applications (e.g. as part of an accountability framework or public reporting on quality of care)
- to provide an overview of quality indicators currently being used for 'high stakes' assessment, including in the US, the UK and other countries in Europe and elsewhere
- to suggest a framework that could be used for selecting indicators which could be applied in Germany at regional level to relate a proportion of payments to quality
- to assess resource allocation models that have been used to distribute healthcare resources in other countries.

This report builds on earlier work by the authors in the field of quality of care, indicator development and application of quality measures for quality improvement (QI), pay for performance, and public reporting/transparency.<sup>3-12</sup>

### 2.1 **Identification of quality indicators currently being used for ‘high stakes’ assessment in high-income countries**

The selection of quality measurement systems to be reviewed for this report was informed by our previous work.<sup>3 8 13-15</sup> For the purposes of this study, we define ‘quality measurement system’ as a programme that applies indicators, or a set of indicators used by organisations, to assess the quality of care. We use the terms ‘indicator’ and ‘measure’ interchangeably while recognising that they are conceptually different (a ‘measure’ operationalises what the indicator intends to assess). Likewise, although ‘quality’ and ‘performance’ have been conceptualised in different ways we here use these terms interchangeably to reflect that in some settings indicators that elsewhere are considered as quality indicators are being used as elements of performance frameworks and consequently labelled as such (e.g. New Zealand PHO Performance Program; Saskatchewan’s (Canada) Performance Management Accountability Indicators; see below).

Three key criteria informed the selection of indicators included in this report:

1. *The measurement system should focus on assessing the quality of care delivered in the ambulatory care sector* because the resource allocation framework currently under review in Germany relates to the ambulatory care sector only. Ambulatory care in Germany is delivered by independent, office-based physicians in private practice, including both primary care physicians and specialists. About 50% of office-based doctors work as family physicians (*Hausarzt*). Of these, about half hold a board certification in family medicine; around 25% are general internists or paediatricians while the remainder are family practitioners without board certification. The remaining 50% are office-based specialist physicians, most frequently in gynaecology; neurology, psychiatry and/or psychotherapy; dermatology; ophthalmology; orthopaedics; and ENT. The KBV represents both groups.

Against this background we reviewed clinical and service quality measurement systems that are designed to assess healthcare providers in ambulatory care settings. In some cases the unit of analysis is the individual physician or groups of physicians, in others it

is health plans or geographical regions. While the focus of the KBV is on establishing a system that will allow for measurement at a regional level, we included all levels in this analysis as regional indicators are often formed by aggregating data from lower levels (with an increase in stability as the level of aggregation increases).

2. *The measures are currently being used in other healthcare systems* in order to demonstrate their ‘workability’ in practice.
3. As our review focuses on ‘high stakes’ applications, measurement systems had to meet at least one of the two requirements:
  - Indicators are currently partly/fully included in a pay for performance (P4P) scheme
  - Indicators are used to release information on quality of care into the public domain (‘public reporting’).

For the review of indicators being used in the US, we identified ‘high stakes’ uses of quality measures by an array of entities, including health plans, the government (e.g. the Veterans Administration) and community collaboratives that represent multi-stakeholder groups (purchasers, payers and providers). The ‘high stakes’ applications included P4P, pay for improvement, and public reporting. As there are over a hundred P4P applications in the US targeted at physicians or groups of physicians, we selected a sample of robust programmes and indicator sets that would illustrate the types of measures used and domains of care covered. Many programmes and indicator sets use similar measures, largely derived from the National Committee for Quality Assurance (NCQA) HEDIS set of measures (see below).

The multitude of quality measurement programmes and indicator sets in place in the US reflects the complex nature of the US healthcare system with multiple overlapping public and private elements. Outside the US, quality measurement systems tend to be more commonly employed at national and/or regional level, usually overseen by public or quasi-public organisations and institutions.<sup>16</sup> Pay for performance and, more frequently, public reporting schemes have only been implemented fairly recently, with the latter most common in the hospital care sector.<sup>13</sup> We focus here on systems in the ambulatory care sector that are in place in Australia, England, New Zealand and Sweden, and selected provinces in Canada. While recognising that other high-income countries or organisations therein are operating quality measurement systems capturing the ambulatory care sector (e.g. the Netherlands and Italy<sup>13</sup>), many tend to be in a developmental stage only and therefore do not meet our criterion of measures in current use.

The only exception is the European Practice Assessment (EPA) indicator set, which we have included in this report even though it is not tied to pay for performance schemes or publicly reported.<sup>17</sup> We included this instrument as it is used widely across European countries, including Germany, as part of accreditation schemes.<sup>16</sup> It is also of interest because it includes a large set of management/organisation indicators that are being used in Germany and are poorly represented in many other indicator sets.

Table 2.1 provides an overview of quality measurement systems reviewed in this study.

**Table 2.1 Quality measurement systems reviewed**

Country	Quality measurement system	Acronym	User	Description
n/a	European Practice Assessment <sup>17</sup>	EPA	Accreditation organisations	Accreditation
Australia	Divisions of General Practice Program. National Performance Indicators 2009/10 <sup>18</sup>	DGPP-NPI	Department for Health and Ageing	Public reporting
	Practice Incentive Program <sup>19</sup>	PIP	Medicare Australia	Pay-for-performance
Canada/ Alberta	Alberta Health Services Board. Quality and Patient Safety Dashboard <sup>20</sup>	AHS-QPSD	Alberta Health Services	Public reporting
	Alberta Health Services. Performance Report <sup>21</sup>	AHS-PR	Alberta Health Services	Public reporting
Canada/ Saskatchewan	Health Quality Council Reports on Quality/Performance <sup>22</sup>	HQC	Health Quality Council and Saskatchewan Health	Public reporting
	Performance Management Accountability Indicators <sup>23</sup>	PMAI	Saskatchewan Health	Public reporting
England	Quality and Outcomes Framework (QOF) <sup>24</sup>	QOF	National Health Service	Pay-for-performance
	World Class Commissioning <sup>25</sup>	WCC	National Health Service	Public reporting
New Zealand	Primary health organisation (PHO) Performance Programme <sup>26</sup>	PHO-PP	District health boards	Pay-for-performance
Sweden	Open Comparisons (Öppna jämförelser) <sup>27</sup>	OC	County councils	Public reporting
United States	American Medical Association – convened Physician Consortium for Performance (PCP) Improvement®	AMA-PCPI	Centers for Medicare & Medicaid Services (CMS); Veterans Administration; Bridges to Excellence (Care First; BlueCross BlueShield)	Pay-for-performance or pay-for-improvement
	Integrated Health Care Association’s pay-for-performance programme, incl. P4P Physician Incentive Bonus; P4P-IT and CAHPS survey implemented by California Cooperative Healthcare Reporting Initiative (CCHRI)	IHA P4P	Integrated Healthcare Association (IHA)	Pay-for-performance or pay-for-improvement
	Centers for Medicare & Medicaid Services – Doctor’s Office Quality	CMS-DOQ	Centers for Medicare & Medicaid Services	Pay-for-performance or pay-for-improvement
	Centers for Medicare & Medicaid Services – Quality Insights of Pennsylvania	CMS-QIP	Centers for Medicare & Medicaid Services	Pay-for-Performance
	Healthcare Effectiveness Data and Information Set <sup>28</sup> and National Committee on Quality Assurance <sup>29</sup>	HEDIS/N CQA	Anthem Blue Cross; CMS; HealthPartners Minnesota; HealthPlus of Michigan; IHA; Bridges to Excellence; Veterans Administration	Pay-for-performance, pay-for-improvement or accreditation
	Institute for Clinical System Improvement <sup>30</sup>	ICSI	Bridges to Excellence (Care First; BlueCross BlueShield)	Pay-for-performance or pay-for-improvement
	Health Plan internal measures	Internal	HealthPlus of Michigan; HealthPartners Minnesota; Anthem Blue Cross	Pay-for-performance or pay-for-improvement

### 2.1.1 Selection of resource allocation models in other countries

The selection of resource allocation models to be reviewed in this study was informed by a scan of the literature on resource allocation<sup>31-32</sup> and earlier work by the authors.<sup>33-34</sup> We consider four countries: Australia, Canada, England and New Zealand, which we chose because they introduced quality measurement systems in the early to mid-2000s, and they are, in part, linked to resource allocation. Consequently, they provide documented experience on the use and potential impact of these systems.

Countries reviewed here provide a fairly broad range of approaches to healthcare organisation and governance. Although all four systems are tax-funded, Australia and Canada operate decentralised systems while England and New Zealand are perceived as more centralist. In all countries, office-based doctors tend to be self-employed, but the usual method of payment differs. Those in Australia and Canada are traditionally paid on a fee-for-service basis, which reflects more closely the situation in Germany; GP practices in England and New Zealand usually receive capitation as the basic form of payment.

Data collection involved a review of the published and grey literature as identified from bibliographic databases (PubMed, Web of Knowledge); the World Wide Web using common search engines (Google Scholar); and governmental and non-governmental agencies and organisations on quality measurement systems and initiatives in the countries under review.

## 2.2 This report

This report proceeds as follows: Chapter 3 describes the components of ‘good care’ as identified from the published and grey literature, with Chapter 4 reflecting on criteria commonly used to select quality indicators for use in ‘high stakes’ assessments. Chapter 5 summarises the key observations of our review of quality indicators in current use, and discusses the strengths and weaknesses of existing sets of indicators, including comments on data requirements, the context for indicator development and stakeholder involvement. Chapter 6 reports on experiences of resource allocation models in four countries.

This report further contains an electronic appendix, which provides a detailed overview of over 800 quality indicators in use in six countries. This dataset can be sorted by country, domain of quality, clinical area and so on.

The literature on quality of care in health is extensive and definitions vary. Indeed the wealth of literature makes it difficult to systematise the concept, reflecting to a substantial degree the diversity in the terms and theories used, with different disciplinary paradigms, norms and values.<sup>16</sup> There has been considerable work on the development of taxonomies and frameworks to acknowledge and capture the multi-domain nature of healthcare quality although a commonly agreed systematic framework is still lacking. We here present a high-level summary of published taxonomies of healthcare quality as a means to identify a set of quality domains for the KBV to consider taking forward.

Donabedian (1980) conceptualised quality of care as “the kind of care which is expected to maximize an inclusive measure of patient welfare, after one has taken account of the balance of expected gains and losses that attend the process of care in all its parts”.<sup>35</sup> Donabedian’s definition has at its core the performance of the individual practitioner in his/her interaction with the patient, which is composed of two elements: technical and inter-personal performance.<sup>36</sup> The ‘goodness’ of technical performance, he argued, is judged in comparison with the best in practice, or the expected ability to achieve improvements in health status made possible by current knowledge in and technology of healthcare (effectiveness). Interpersonal performance is the way in which technical care is delivered. It includes the social and psychological interaction between a patient and the practitioner, requiring a range of skills that have to take account of individual and social expectations and standards, “whether these aid or hamper technical performance”.<sup>36</sup> Subsequent definitions of healthcare quality have expanded on these elements. A widely used definition by the US Institute of Medicine states that quality is “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current medical knowledge”.<sup>37</sup> In a variation of this definition the UK Department of Health (1997) noted that quality of care is “doing the right things (what), to the right people (to whom), at the right time (when), and doing things right the first time”.<sup>38</sup> Ultimately, the choice of definition will depend on the specific context, intended use and acceptability, as will the approach to operationalise the concept for practical use.<sup>16</sup>

As indicated earlier, there has been considerable work on the development of taxonomies and frameworks to operationalise healthcare quality. A comparatively simple approach is that proposed by Donabedian (1980, 1988),<sup>35-36</sup> who noted that healthcare can be evaluated according to structure, process and outcome, as “good structure increases the likelihood of good process, and good process increases the likelihood of good outcome”.<sup>36</sup>

This approach has subsequently been adopted widely in health services research, and, more importantly, been used to guide the development of measures that address all aspects of quality. For example, Campbell et al. (2000) define quality of care in relation to individuals, that is whether they can access the health structures and processes of care they need and whether the care received is effective.<sup>39</sup> They relate this further to healthcare structures, care processes and outcomes, producing a taxonomy of quality of care for individual patients (Table 3.1).

**Table 3.1 Domains of quality of care for individual patients**

<b>Quality</b>	<b>Care</b>		
	<i>Healthcare system (structure)</i>	<i>Patient-centred care (process)</i>	<i>Consequences of care (outcome)</i>
Accessibility	Geographic/physical access Affordability Availability	Affordability Availability	Health status User evaluation
Effectiveness		Effectiveness of clinical care Effectiveness of inter-personal care	Health status User evaluation

SOURCE: adapted from Campbell et al. (2000)<sup>39</sup>

More complex frameworks have evolved since, distinguishing a range of domains, sometimes also referred to as dimensions, of quality of care. Table 3.2 provides an overview of the most common domains proposed by a range of (seminal) frameworks/authors.<sup>16</sup>

**Table 3.2 Domains of quality of care**

	Donabedian (1988) <sup>36</sup>	Maxwell (1992) <sup>40</sup>	UK Department of Health (1997) <sup>38</sup>	Council of Europe (1997) <sup>41</sup>	Institute of Medicine (2001) <sup>42</sup>
Effectiveness	✓	✓	✓	✓	✓
Efficiency	✓	✓	✓	✓	✓
Access	✓	✓	✓	✓	
Safety	✓			✓	✓
Equity	✓	✓	(✓)		✓
Appropriateness	✓	✓		✓	
Timeliness					✓
Acceptability		✓		✓	
Responsiveness		Respect Choice Information			Respect Patient-centeredness
Satisfaction			(✓)	✓	
Health improvement	✓		✓		
Continuity					✓
Other		Technical competence Relevance		Efficacy	

SOURCE: adapted from Legido-Quigley et al. (2008)<sup>16</sup>

A similar overview was presented by Kelley and Hurst (2006), who reviewed national documents on performance and/or quality indicators in a range of OECD countries (Table 3.3).<sup>43</sup>

**Table 3.3 Domains of the technical quality of healthcare**

	UK (1999) <sup>44</sup>	Canada (2005) <sup>45</sup>	Australia (2004) <sup>46</sup>	USA (2006) <sup>47</sup>	European Community Health Indicators (2003) <sup>48</sup>	Commonwealth Fund (2004) <sup>49</sup>	WHO (2000) <sup>50</sup>
Acceptability		✓				✓	
Accessibility	✓	✓	✓	✓*		✓	
Appropriateness		✓	✓			✓	
Capacity	✓						
Competence or capability	✓	✓	✓				
Continuity		✓	✓			✓	
Effectiveness or improving health or clinical focus	✓ ✓	✓	✓	✓	✓	✓	✓
Efficiency		✓	✓	(✓)	✓	✓	✓**
Equity		✓***	✓***	✓***			✓
Patient-centeredness or patient-focus or responsiveness	✓	✓?	✓	✓			✓
Safety		✓	✓	✓			
Sustainability			✓				
Timeliness	✓?*			✓			

NOTE: \* operationalised as a dimension of equity; \*\*implied in the calculation and definition of attainment indices; \*\*\*cross-cutting dimension that applies to all other domains/dimensions; () not yet operationalised; ? implied in operationalisation of 'acceptability'; ?\* implied in operationalisation of 'patient focus'

SOURCE: adapted from Kelley & Hurst (2006)<sup>43</sup>

Generally, the range of domains proposed by different authors/frameworks is fairly similar with the most common domains of quality in healthcare relating to effectiveness, efficiency and access, followed by patient focus or responsiveness and related concepts, as well as safety and equity. However, distinctions are not clear cut, with for example the equity domain considered as cross-cutting across a range of quality or performance measurement frameworks as illustrated in Table 3.3.

More recently, Klassen et al. (2010) performed a systematic review of performance and improvement frameworks in a range of systems, including health systems.<sup>51</sup> In an advance on previous reviews of domains of quality and/or performance, they applied a 'concept sorting exercise' to identify a set of common quality concepts. Using this approach, they extracted 16 concept groups, which they then used to describe the "salient aspects of quality" of 88 primary frameworks (identifying 111 frameworks) across health, education and social services systems. They grouped the 16 concepts further according to five

headings: collaboration, learning and innovation, management perspective, service provision and outcome (Table 3.4).

**Table 3.4 Quality concepts in performance measurement and improvement frameworks**

Theme	Quality concept
Collaboration	<i>Collaboration</i> : Linkages and partnerships that are established among different service delivery systems, networks and providers to enable effective planning and the implementation of a high-quality integrated service
Learning and innovation	<p><i>Creating and using knowledge</i>: extent of commitment to a continuous learning environment that supports research, the development, dissemination and exchange of information and knowledge, and the creation and application of evidence-based practice guidelines and standards</p> <p><i>Quality improvement processes</i>: system of processes and activities that promote continuous quality improvement, including those related to programme evaluation, performance monitoring, accountability and accreditation</p> <p><i>Workforce development and support</i>: degree to which a service delivery system manages and develops its workforce through a variety of processes (e.g. providing a supportive and safe work environment, providing opportunities for learning and growth, valuing staff satisfaction)</p>
Management perspective	<p><i>Leadership/governance</i>: how a service or organisation engages in strategic planning processes to develop and facilitate the achievement of its values, mission and vision, to be responsive to change, and to achieve sustainable success</p> <p><i>Infrastructural capacity</i>: a service or organisational infrastructure, e.g. physical facilities, equipment, fiscal resources, human resources and process management</p> <p><i>Business/financial management</i>: extent to which business and financial development plans are developed, implemented and monitored, and address issues such as efficiency, resource allocation, stability and process management</p>
Service provision	<p><i>Equity/fairness</i>: provision of services that are of equal quality and that are distributed fairly across populations, regardless of client characteristics</p> <p><i>Availability/accessibility</i>: extent to which services are available and accessible (geographical location, physical environment, affordability) in a timely manner</p> <p><i>Comprehensiveness</i>: extent to which there is a range of services provided that is broad enough in scope and depth to meet client needs</p> <p><i>Appropriateness</i>: services represent a 'best fit' with client needs, and are based on established standards and evidence</p> <p><i>Client centeredness</i>: extent to which the planning and delivery of services involves clients, provides them with information to support their decision-making, and is positive, acceptable and responsive to their needs and expectations, and respectful of privacy, confidentiality and differences (e.g. cultural, socioeconomic)</p> <p><i>Coordination</i>: provision of services that are continuous, integrated and organised around the client, both within and across service settings and over time</p> <p><i>Client safety</i>: any actual or potential harm to the client, through the provision of a service, that is prevented, avoided, reduced or minimised through integrated risk management activities</p>
Outcome	<p><i>Effectiveness</i>: extent to which a service achieves the desired result(s) or outcome(s), at the client, population or organisational level</p> <p><i>Client perspective</i>: extent to which the client perspective and experience of a service is measured and valued as an outcome of service delivery</p>

SOURCE: adapted from Klassen et al. (2010)<sup>51</sup>

Klassen et al. (2010) further distinguished three levels of application, defined as level of aggregation with regard to the provider–service user interface, with level 1 relating to specific services, programmes, units or departments (e.g. hospital department, primary care team); level 2 to organisations or institutions that comprise individual programmes, units

or departments (e.g. hospitals); and level 3 to systems that comprise a number of organisations or institutions (e.g. national health system).<sup>51</sup> This differentiation is similar to that proposed by Plochg and Klazinga (2002) who highlighted the need to distinguish the different levels of decision-making within a healthcare system for assessment, separating the micro- (primary process of patient care) from the meso- (organisational context) and the macro-level (financing and policy).<sup>52</sup> Klassen et al. (2010) found that within the health sector 46 of 97 identified frameworks were at the system level. The frameworks covered a broad range of settings and service areas including health systems (33), hospitals or health organisations (17), and population/public health or community health (10). Several were applicable to specific populations (e.g. children, women, elderly) or service areas (e.g. palliative care, mental health, rehabilitation services).<sup>51</sup>

The quality concepts identified by Klassen et al. (2010) bring together the various quality domains described in earlier frameworks (Table 3.2, Table 3.3) in a way that allows for a better distinction between overlapping domains while confirming that frameworks, irrespective of their origins, tend to be composed of very similar elements.<sup>51</sup>

Building on the concepts presented here, we propose nine domains of healthcare quality for consideration by the KBV. Our selection of domains was guided by the themes identified by Klassen et al. (2010) (Table 3.4)<sup>51</sup>, focusing on ‘service provision’ and ‘outcome’ in accordance with seminal frameworks described above and management/organisation added to reflect the importance of formalised structural and/or management aspects that are considered important for the delivery of high quality care.<sup>36</sup> We include ‘screening/primary prevention’ as a separate domain to emphasise its role in population health improvement efforts:

1. *Screening/primary prevention*: Strategies aimed at preventing the development of a disease (e.g. immunisation) (primary prevention) or the testing of a symptomless population in order to detect cases of a disease at an early stage (screening).
2. *Access/availability*: Extent to which services are available and accessible in a timely manner.
3. *Clinical effectiveness*: Extent to which a service achieves the desired result(s) or outcome(s), at the patient, population or organisational level.
4. *Safety*: Extent to which healthcare processes avoid, prevent and ameliorate adverse outcomes or injuries that stem from the processes of healthcare itself.
5. *Efficiency*: Relationship between a specific product (output) of the healthcare system and the resources (inputs) used to create the product.
6. *Equity*: Extent to which the distribution of healthcare and its benefits among a population is fair; it implies that, in some circumstances, individuals will receive more care than others to reflect differences in their ability to benefit or in their particular needs.
7. *Comprehensiveness/coordination*: Extent to which there is a range of services provided that is broad enough in scope and depth and/or are continuous, integrated and organised to meet service user needs.

8. *Patient experience*: Extent to which the patient perspective and experience of a service is measured and valued as an outcome of service delivery.
9. *Management/organisation*: Extent to which management processes are in place to deliver the above domains of quality.

## CHAPTER 4 **Selecting indicators for ‘high stakes’ applications**

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Measurement has an important role in quality improvement, as a means to monitor effectiveness, protect patient safety, inform decision-making and ensure value for money, among many other purposes.<sup>53</sup> Therefore, most countries that have prioritised quality improvement have established systems in which, in one way or another, the quality of care provided is measured first.<sup>16 54</sup>

The range of methods chosen to improve quality vary widely between countries.<sup>55</sup> For example, in England/the UK in the last ten years, the following measures have been used as part of a national strategy to improve the quality of primary care:

- developing national standards for the management of major chronic diseases
- introducing clinical governance, using a coordinated approach to local quality improvement activities
- doctors joining quality improvement collaboratives as one approach to rapid quality improvement (‘plan–do–study–act’ cycles)
- annually appraising all doctors working in the National Health Service (NHS); during their appraisals they are expected to provide evidence on the quality of care they provide
- introducing new types of contract, including specification on the quality of care to be provided
- releasing information on quality of care in individual primary care practices publicly
- using financial incentives to doctors to reach a range of quality targets (Box 4.1)
- introducing a national system of inspection of healthcare providers.

**Box 4.1 Pay for performance in UK primary care**

In England/the UK, a substantial investment was made in primary care through a pay for performance scheme, the Quality and Outcomes Framework (QOF), so 25% of UK general practitioners' pay now relates to the quality of care they provide (see also Section 6.4.3). This was made possible because of a government commitment in the late 1990s to increase levels of health spending (so it reached mid-European levels as a percentage of gross domestic product). Recruitment to general practice was poor at the time, and professional morale was low. The government and the British Medical Association agreed that a significant increase in pay was necessary to address problems of recruitment, and payments for quality were used as the vehicle to justify the increase in resources.<sup>56</sup>

In general, the literature suggests that none of these methods provides a 'magic bullet' – there is no single approach that can be guaranteed to lead to a major improvement in quality. Indeed, it is likely that only a combination of multiple interventions sustained over time will improve quality.<sup>9 57</sup> However, this does not mean that major improvements in quality cannot be achieved. Table 4.1 shows data from a representative sample of primary care practices in the UK, illustrating that major improvements in quality have been achieved over time as a function of concerted efforts regarding quality improvement support, financial incentives and transparency.

**Table 4.1 Improvements in the quality of care provided in UK primary practice, 1998 and 2007**

	1998	2007
Patients with coronary heart disease, total cholesterol $\leq$ 5mmol/l	17%	80%
Patients with coronary heart disease, blood pressure $\leq$ 150/90	48%	83%
Asthma: smoking cessation advice recorded for smokers	63%	99%
Asthma: self-management plan recorded for patients on high dose inhaled steroids	35%	89%
Diabetes: Haemoglobin A1 $\leq$ 7.4	35%	55%
Diabetes: Total cholesterol $\leq$ 5mmol/l	22%	79%

SOURCE: adapted from Campbell et al. (2009)<sup>3</sup>

Yet, while measurement is an important component of quality improvement, identifying measures to capture the quality of care in its different domains remains a challenging aspiration.<sup>58</sup> In the following section we provide a high-level summary of the published evidence on desired attributes of quality indicators as a means to inform indicator development.

The term 'quality indicator' has been defined in different ways,<sup>7 59-60</sup> however, the common notion is that an observed change in a given indicator reflects a change in the underlying healthcare delivery and in quality of care.<sup>58</sup> Therefore, if quality measurement is to guide quality improvement, indicators should meet certain criteria to allow for appropriate conclusions about cause and effect to be drawn and/or a course of action taken. More simply, the evidence needs to show that taking a particular action leads to some desired outcome – such as lower morbidity or mortality. However, quality measures are frequently selected on the basis of what is available and practical ('measurable'),<sup>61</sup> and the extent to which they reflect the quality of healthcare, or indeed their implications for policy, often remains unclear.

As the role of quality indicators has changed from use in research projects to use in policy and purchasing decisions, the selection of indicators has become more formalised, and explicit evaluation criteria have been developed to guide selection decisions. This development originated in the US with the work of the Institute of Medicine for the national quality report<sup>54</sup> and the Strategic Framework Board for a national quality measurement and reporting system.<sup>7</sup>

The initial work of those two groups resulted in four core evaluation criteria:

- *Importance*: Does the indicator provide information on a topic of relevance to decisionmakers?
- *Scientific soundness*: Does the indicator capture the underlying construct in a reliable and valid way, and is it based on evidence or solid professional consensus?
- *Feasibility*: Is it possible to collect data for the indicator with reasonable effort?
- *Usability*: Can the indicator provide actionable information for decisionmakers?

These and other efforts have led to formal and universally accepted evaluation criteria for the initial adoption of indicators that are now being used by a variety of organisations worldwide. For example, the criteria have been incorporated into the framework for the OECD Health Care Quality Indicators (HCQI) project, an international collaboration to define indicators for health system comparisons (Box 4.2).<sup>43</sup>

#### **Box 4.2 OECD HCQI project: Indicator selection criteria**

Indicators selected for inclusion in the OECD HCQI project are considered a tool for evidence-based policy decisions and therefore have to meet two conditions: to capture an 'important performance aspect' and to be scientifically sound.<sup>43</sup> Importance is assessed according to three dimensions: the measure addresses areas in which there is a clear gap between the actual and potential levels of health; the measure reflects important health conditions in terms of burden of disease, cost of care or public interest; and measures can be directly affected by the healthcare system. The second criterion, scientific soundness, requires indicators to be valid (i.e. the extent to which the measure accurately represents the concept/phenomenon being evaluated) and reliable (i.e. the extent to which the measurement with a given indicator is reproducible).

The most detailed operational definitions for those criteria are currently maintained by the National Quality Forum (NQF) (2009), a consensus body to select indicators in the US.<sup>62</sup> A summary of those criteria adapted for potential use by the KBV is provided in Box 4.2 below. These criteria usefully capture the wide range of desirable attributes of quality indicators discussed in the literature,<sup>8</sup> with for example Pringle et al. (2002) proposing a list of 12 attributes to guide indicator selection, arguing that these should, in addition to being valid and reliable, also be communicable, effective, objective, available, contextual, attributable, interpretable, comparable, remediable and repeatable,<sup>63</sup> while others have added adaptability,<sup>64</sup> feasibility,<sup>65</sup> acceptability,<sup>59</sup> policy relevance<sup>65-66</sup> and actionability<sup>67</sup> as further criteria for quality indicators.

The set of NQF criteria are completely exhaustive and mutually exclusive, which make them a very useful tool for operational decisions. They are widely used in the US, and have also been adapted for indicator selection projects in, for example, the Netherlands<sup>68</sup> and

Singapore.<sup>69</sup> Given their widespread use and operational utility for indicator evaluation, we recommend that KBV uses them to inform the development of a resource allocation framework in the German healthcare system.

We would like to point out that these criteria do not function like algorithms that will select an undisputed set of indicators based on explicit rules. In many cases, experts need to judge whether or not an indicator meets a criterion, and those decisions will be context dependent. For example, priorities differ between healthcare systems, leading to different judgements on the ‘importance’ criterion. Similarly, evaluation of the ‘scientific acceptability’ criterion has to incorporate expert opinion, because only a few areas of medicine, e.g. coronary heart disease, have an evidence base robust enough to be used as sole source of information.<sup>58-59</sup> Further challenges may arise in relation to the transferability of quality indicators between countries<sup>70</sup> because of differences in professional opinion and in the interpretation of evidence; also the evidence base used might vary, for example building on evidence that is available in the native language of one country only.<sup>71-73</sup>

Structured expert consultation methods, such as the RAND/UCLA Appropriateness Method, can and have been widely used as a formal and transparent method of combining evidence with professional opinion in order to develop quality indicators.<sup>74</sup>

**Box 4.3 Indicator evaluation criteria (adapted from NQF)**

1. *Importance*
  - a. Does the measure address a priority area or focus on a high impact aspect of healthcare (epidemiological relevance, financial relevance, policy relevance)?
  - b. Do data demonstrate variability in care and/or uniformly poor performance across providers or population groups, presenting an opportunity for improvement?
2. *Scientific acceptability*
  - a. Is the specific outcome, intermediate outcome, process or structure captured by the measure consistent with clinical practice guidelines, reflecting a solid of evidence base?
  - b. Is the scientific basis behind the measure mature and stable, ensuring that the measure will remain valid in the foreseeable future?
  - c. Can the measure be constructed reliably?
  - d. Does the measure possess face validity as representing quality of care and capturing variable or poor performance?
  - e. Is there a sound evidence base for the specifications and any exclusions?
  - f. For outcome measures, has an adequate risk adjustment approach been specified?
  - g. What is the rationale for any stratification by population characteristics to detect disparities in care and outcomes?
3. *Usability*
  - a. Can the measure inform actions and decisions by users such as providers, public, purchasers?
  - b. Does the measure provide a distinctive or additive value to existing measures?
  - c. Can real differences in performance be identified and interpreted using comparative data?
  - d. Is the information produced by the measure meaningful and understandable to relevant audiences?
  - e. To what extent are processes and outcomes related to this measure under the control of the entity being measured?
  - f. Can the measure be adapted to multiple populations or applied across different healthcare settings?
4. *Feasibility*
  - a. Can readily available data be used to assess this measure to minimise the burden of data collection?
  - b. Is data collection feasible with realistic burden (timing, frequency and sampling)?
  - c. Does the value of information provided by the measure outweigh the cost and burden of data collection?
  - d. Are data items auditable to detect errors or inaccuracies and can misrepresentation and fraud be minimised?
  - e. Can unintended consequences be foreseen and avoided?
  - f. Is patient confidentiality adequately protected?

SOURCE: adapted from the National Quality Forum<sup>62</sup>



## CHAPTER 5 **Overview of quality indicators in current use**

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This chapter summarises the key observations of our review of quality indicators in current use. It discusses the strengths and weaknesses of existing sets of indicators, comments on data requirements and illustrates the importance of context for indicator development and stakeholder involvement.

### 5.1 **Overview of key observations**

#### 5.1.1 **Classification of indicators into domains of quality**

We identified and catalogued a broad set of quality indicators being used in ‘high stakes’ applications by organisations in six countries as described in Chapter 2. The complete list of indicators is available in the electronic appendix.

To categorise the measures, we allocated each indicator to one or more of nine domains of quality as identified in Chapter 3:

1. screening/primary prevention
2. access/availability
3. clinical effectiveness
4. safety
5. efficiency
6. equity
7. comprehensiveness/coordination
8. patient experience
9. management/organisation.

We adopted Donabedian’s quality framework to further classify indicators as structure, process and outcome measures (Table 5.1).<sup>36</sup> We divided the outcomes category into intermediate and clinical outcomes. Intermediate outcomes capture control of physiologic parameters, such as blood pressure or LDL cholesterol level, whereas clinical outcomes reflect actual endpoints, such as acute myocardial infarction. As a convention, we classified indicators relating to staff job satisfaction as intermediate outcomes.

**Table 5.1 Defining structure, process and outcome according to Donabedian**

	<b>Definition</b>
Structure (input)	Attributes of the settings in which care occurs; resources needed for healthcare: <ul style="list-style-type: none"> <li>• material resources (facilities, capital, equipment, drugs etc.)</li> <li>• intellectual resources (medical knowledge, information systems)</li> <li>• human resources (healthcare professionals).</li> </ul>
Process	Use of resources: what is done in giving and receiving care: <ul style="list-style-type: none"> <li>• Patient-related (clinical care, intervention rates, referral rates etc.)</li> <li>• Organisational (supply with drugs, management of waiting lists, payment of healthcare staff, collection of funds etc.).</li> </ul>
Outcome	Effects of healthcare on the health status of patients and populations: <ul style="list-style-type: none"> <li>• definite: mortality, morbidity, disability, quality of life, patient experience</li> <li>• intermediate: blood pressure, LDL cholesterol levels.</li> </ul>

SOURCE: Adapted from Nolte et al. (2005)<sup>75</sup>

It is important to note that some indicators were not exclusive to one domain of quality, and we therefore allocated up to two domains to each indicator. Even so, the distinction between domains is not always clear cut and we used an element of judgement to classify indicators. Senior members of the research team reviewed all codes, working in pairs to reconcile disagreements. Although most indicators were simple to classify, the issue of classification is a general one and Box 5.1 provides an example for an indicator that could be classified in a number of different ways.

#### **Box 5.1 Example of overlapping domains of quality**

*Indicator.* The percentage of patients without documentation of ‘red flags’ who had back surgery within the first six weeks of the onset of back pain (US/NCQA).

*Comment.* The purpose of this indicator is to discourage unnecessary back surgery – people should not have back surgery within a few weeks of the onset of pain unless there are imperative clinical reasons (‘red flags’) for surgery. This could be regarded as an indicator of **clinical effectiveness** (patients should not have treatments that are not clinically indicated), a **safety indicator** (patients are exposed to harm by having unnecessary operations) or an **efficiency indicator** (unnecessary operations waste resources).

We did not consider sole utilisation indicators, such as rates of office visits, except for cases in which differential utilisation among selected population groups likely reflects unmet need and increasing utilisation is therefore seen as a measure of improved access or equity, as is the case in the New Zealand Primary Health Organisation (PHO) Performance Programme.<sup>26</sup> We also excluded indicators that related mainly to hospital care, including procedures carried out solely in hospitals and indicators such as rates of emergency readmission within 28 days of a previous admission. These are generally regarded as measures of hospital quality rather than quality of care in the ambulatory care sector.

#### **5.1.2 What quality indicators measure and what they do not measure**

When using explicit measures of quality and performance (those that have a specific numerator and denominator population) it is important to understand what they do and do not measure. Inspection of the list of indicators compiled for this work (see electronic appendix) reveals that the measures are very selective in what aspects of care they cover.

First, the majority of the 826 indicators considered here relate to clinical effectiveness with few on efficiency and even fewer on equity. Our review of 18 indicator systems in six countries found that clinical effectiveness indicators are represented in all systems, although their relative weight varies, ranging from 19% (Australia) to over 60% (Sweden, US) of all indicators in a given set. Screening/primary prevention indicators are represented in all but one system (EPA), accounting for between 16% (Australia, Canada) and 26% (New Zealand). Indicators relating to aspects of management are also represented in most systems, ranging from 1–2% (Canada, New Zealand) to 70% (EPA). Indicators on access/availability form an important component in Australia (just under 40%), Canada (26%) and Sweden (around 20%) only. Indicators for patient experience and patient safety are less common while indicators of coordination, efficiency and equity are rarely used. It should be noted, however, that these relative figures only reflect the primary quality domain to which we assigned indicators. As the example of back pain (Box 5.1) illustrates, domain assignment is often not clear-cut and the distribution and relevance of certain dimensions as measured by indicator count might change if the second domain were taken into account. Also, the absolute number of indicators per system/country varies considerably, ranging from 19 indicators in New Zealand and 37 in Australia to 212 in England and the US. Consequently, reassigning indicators to domains will have a differential impact on the relative importance of domains by country. Finally, it should be noted that the apparent lack of explicit indicators on equity may be misleading, because equity is often not measured by dedicated indicators but by looking at the variance of indicators across socio-demographic subgroups.<sup>43</sup> Overall, while it is important to emphasise that the lists do not reflect a complete inventory of all indicator systems, we are confident that we have covered a representative selection of indicator systems used for high-stakes applications in high-income countries.

Second, coverage within certain domains remains highly variable. For example, most clinical effectiveness measures focus on primary care and there is a dearth of measures for specialty care services. Coverage is generally good for well-defined, common conditions with a solid evidence base, such as heart disease and diabetes, but fewer measures exist for complex conditions, such as mental disorders, disability and frailty. Table 5.2 shows selected indicators on clinical effectiveness and the conditions/clinical areas to which they apply as extracted from the indicator systems under review. The relatively high number of indicators classified as ‘mental health’ might appear contradictory to what we observe above; however, it should be noted that the great majority of these measures focus on depression (see electronic appendix for further details).

**Table 5.2 Selected indicators of clinical effectiveness**

Condition/clinical area	Number of indicator systems	Country	Number of indicators in appendix*
Cancer	4	England, Sweden, US	12
Diabetes	12	Australia, Canada, England, New Zealand, Sweden, US	59
Cardiovascular disease (CVD)			
Coronary heart disease	7	Australia, England, Sweden, US	28
Heart failure	3	England, US	13
Stroke and TIA	2	England, Sweden	9
Other	11	Canada, England, New Zealand, Sweden, US	29
Respiratory disease			
Asthma	9	Australia, Canada, England, New Zealand, Sweden, US	20
Chronic obstructive pulmonary disease (COPD)	3	England, US	13
Mental health	9	Canada, England, Sweden, US	32
Epilepsy	1	England	3
Maternal and newborn health	4	England, Sweden, US	11
Orthopaedics	3	Sweden, US	15
Geriatrics	3	Canada, Sweden, US	4
Medication	4	EPA, Sweden, US	7
Population health	2	England, Sweden	5

NOTE: \*some indicators had duplicates or near duplicates in other indicator sets, so the numbers in the table only give a general idea of the frequency with which areas were covered.

In ‘high stakes’ assessments (e.g. pay for performance), such selective coverage can lead to distortion, because only aspects of care that can be measured get incentivised. Some refer to this as “teaching to the test”. To some extent this may be intentional (the aim of a P4P scheme is to draw attention to the need for quality improvement for certain aspects of care). However, unintended consequences, such as the risk of distracting attention and resources from areas not covered by indicators, should not be overlooked. For example, a review of the impact of annual performance ratings of NHS providers in England between 2001 and 2005 showed that the assessment system improved reported performance on key targets such as hospital waiting times.<sup>76</sup> However, the analysis also revealed that in some cases these improvements were made at the expense of clinical areas where performance was not measured or were undermined by different forms of gaming such as data manipulation.

We also note that indicators mostly capture gaps in care or underuse of recommended services (e.g. blood glucose test not administered). Indicators for overuse are relatively rare, because it remains difficult unambiguously to identify inappropriate service delivery. The example of back surgery illustrated in Box 5.1 provides one of the few indicators to this

effect identified in this study. More generally, we do not have the evidence to support what things in medicine should not be done or will cause harm. This is a significant weakness of current approaches to quality measurement, especially as overuse of medical procedures is a substantial problem in many developed countries,<sup>77-78</sup> including Germany.<sup>79</sup>

Risk adjustment is another concern. For example, Giuffrida et al. (1999) demonstrated how using emergency admission rates for certain conditions (asthma, diabetes, epilepsy) as an indicator of the quality of primary care can be misleading.<sup>4</sup> They found that admission rates are influenced by a range of factors, including population characteristics such as socioeconomic profile and morbidity ('case-mix') and secondary care characteristics, which are usually outside the control of primary care practices. Adjusting rates to take account of these factors is a pre-condition to make this indicator applicable as a measure of primary care quality.

Attributing responsibility to a provider is also a major challenge, especially for population health indicators that are being used by some quality measurement systems, such as total and infant mortality or life expectancy at birth (England/World Class Commissioning<sup>25</sup>; Sweden/Open Comparisons<sup>27</sup>). These long-term outcomes are affected by the actions of many providers as well as patient behaviours, patient characteristics, and the underlying features of the public health and delivery system. While they are important tools for quick and simple assessments of societal achievement, these indicators provide only limited insights into specific components of the healthcare system that impact on health.<sup>80</sup>

### 5.1.3 Efficiency measures

There is a particular interest in measures of efficiency given the position of the KBV in the German healthcare system, but the measurement science in this field is not well advanced and consequently very few efficiency indicators could be identified as being in routine use for this report. The challenge is that, while efficiency relates to value for money, indicator development has so far focused on effectiveness and cost indicators, with little combination of the two (Box 5.2).

#### Box 5.2 Measuring efficiency

Measuring healthcare efficiency is fraught with challenges. This relates, in part, to the terminology, with concepts varying by discipline and/or perspective, and, importantly, to the uncertainties in measuring efficiency. A recent systematic review of healthcare efficiency measures identified 265 such measures from 172 peer-reviewed articles out of which only about one-fifth were related to physicians (as individuals or in groups).<sup>81-82</sup> Importantly, there was little evidence of scientific soundness, one of the key indicator evaluation criteria (Chapter 4), with only about 2% of all efficiency indicators reviewed having information on reliability or validity reported.<sup>81</sup> Few measures had evaluated health outcomes as the output and the link to quality is rarely established, indicating that available indicators tend to reflect costs of care only, and not efficiency.

The UK NHS routinely publishes data on a set of efficiency measures ('NHS Better Care, Better Value Indicators') although they relate mainly to hospitals.<sup>83</sup>

There has been a desire to combine quality and efficiency measures; however, at this stage there are few combined measures that truly reflect value for money. Rather, quality and efficiency measures are shown side by side to give some sense of value.

Efficiency measures currently in use in the US are so-called measures of relative resource use. For those measures, all care delivered to a given patient during a calendar year is grouped into episodes with computerised algorithms. To illustrate, an office visit for a diagnosis of shortness of breath, chest x-rays and several blood tests, followed by an admission for pneumonia and a follow-up visit after discharge, could be grouped as an episode of acute pneumonia. Two office visits for diabetes, HbA1c blood tests and an eye exam could be grouped as an episode of uncomplicated diabetes, and so on. Efficiency metrics then compare the resources used to handle those episodes either against other physicians or against normative standards of care.

Such relative resource use measures are commonly used by health plans in the US, but applying them to other jurisdictions is not straightforward. First, the episode grouping technologies and the standards are commonly proprietary. Second, the evidence base behind the measures is often not documented or not accessible in the public domain. Third, the measures are based on US prices and care standards, which may differ substantially from those in Germany although these tools can be used without prices by just measuring differential use of services.

#### 5.1.4 Importance of local priorities

Inspection of the indicators in the electronic appendix shows that the patterns of indicators differ by country:

- Canada and Sweden have a high proportion of indicators on access.
- New Zealand and Australia include equity indicators relating to particular population groups.
- England/the UK has a high proportion of clinical effectiveness indicators.

These differences in focus can be explained by local values and perceptions of problems in local healthcare systems, and political factors. In Canada and Sweden, for example, there is great concern about waiting times for treatment. In New Zealand, by contrast, there is concern that Māori and Pacific Island populations do not have fair access to medical care; similar issues apply to indigenous groups in Australia. England/the UK has a high proportion of detailed clinical effectiveness indicators, reflecting the higher penetration of electronic medical records in England/the UK compared with other countries and thus better availability of clinical data for indicator implementation. The US has a long tradition of preventive medical care, with high patient demand for medical ‘check ups’; this is reflected in the comparatively high number of screening/primary prevention indicators.

#### 5.1.5 Examples of quality indicators in each of the domains of quality

In this section we give illustrative examples of six indicators from each of the main domains of quality that we identified in Chapter 3 (Tables 5.3–5.11).

A full listing of the indicators can be found in the electronic appendix, which allows sorting indicators by domain of quality and other characteristics.

**Table 5.3 Selected indicators of screening/primary prevention**

Source	Indicator summary	Organisation/country
PHO-PP	Percentage of women aged 20–69 (adjusted for the expected number of hysterectomies) who have had a cervical smear in the past three years	New Zealand
AHS-PR	Influenza immunisation rate for over 65s	Alberta, Canada
PHO-PP	Percentage of eligible population who have had a cardiovascular risk assessment recorded in the previous five years	New Zealand
NCQA	Percentage of adults aged 50–75 who had appropriate screening for colorectal cancer	US: CMS, Integrated Healthcare Association
AHS-PR	Immunisation coverage for mumps, measles and rubella (MMR) at age 2	Alberta, Canada
WCC	Percentage of women aged 15–24 screened or tested for Chlamydia	England

**Table 5.4 Selected indicators of access/availability**

Source	Indicator summary	Organisation/country
HQC	Number of days from the family physician visit that initiates a referral for breast cancer to the diagnosis confirmed through a biopsy	Saskatchewan, Canada
HEDIS- NCQA	Percentage of calls received by the Health Plan's call centers (during operating hours) that were answered by a live voice within 30 seconds.	US: Health Plans
OC	Visit to psychiatry clinic: percentage with waiting time >90 days	Sweden
AHS-QPDS	Time from referral to consultation with an oncologist	Alberta, Canada
PIP	The practice GPs provide after hours cover to practice patients 24 hours, 7 days a week	Australia
QOF	Percentage of patients who could get a GP consultation within 2 days (of those who tried in preceding 6 months)	UK/England

**Table 5.5 Selected indicators of clinical effectiveness**

Source	Indicator summary	Organisation/country
AMA-PCPI	Percentage of patients aged 18 and older with a diagnosis of coronary artery disease (CAD) and prior myocardial infarction (MI) who were prescribed beta blocker therapy	US: CMS
OC	Percentage of HIV-patients with good viral control (HIV-RNA <50 copies/ml) of all patients receiving antiretroviral therapy, 2008–2009	Sweden
PIP	Completed 'cycles of care' for people with moderate to severe asthma	Australia
QOF	Percentage of patients with a history of transient ischaemic attack (TIA) whose last blood pressure (measured in previous 15 months) is 150/90 or less	UK/England
HQC	Percentage of persons with asthma who have poor asthma control	HQC Saskatchewan, Canada
QOF	Percentage of patients on lithium with a record of lithium levels in the therapeutic range in the previous 6 months	UK/England

**Table 5.6 Selected indicators of safety**

<b>Source</b>	<b>Indicator summary</b>	<b>Organisation/country</b>
OC	Percentage of people aged 80 or older who take 10 or more drugs concurrently	Sweden
AHS-QPSD	Number of falls while receiving continuing care	Alberta, Canada
QOF	The practice has undertaken a minimum of 12 significant event audits in the previous year (including new cancer diagnoses and suicides)	UK/England
QOF	There is a system for checking the expiry date of all drugs held in the practice	UK/England
HEDIS-NCQA	The percentage of Medicare members aged 65 or older who received at least one high risk medication	US: health plans
QOF	The hepatitis B status of all doctors is recorded and immunisation recommended if required, in accordance with national guidelines	UK/England

**Table 5.7 Selected indicators of efficiency**

<b>Source</b>	<b>Indicator summary</b>	<b>Organisation/country</b>
Internal	A decrease in the primary physician group utilisation of PCP treatable non-emergent ER visits, per 1000 members for the measurement year	US: HealthPlus of Michigan
NCQA	Percentage of members with a primary diagnosis of low back pain who did not have imaging (X-ray, CT or MRI) within 28 days	US: Integrated Healthcare Association
NCQA	Percentage of patients without documentation of 'red flags' who had back surgery within the first six weeks of the onset of back pain	US: Bridges to Excellence
HEDIS NCQA	Frequency of procedures with evidence of inappropriate over-utilisation (inc. tonsillectomy, non-obstetric D&C, hysterectomy, prostatectomy)	US: health plans
Internal	Generic drug prescribing rate	US: Anthem Blue Cross
PHO-PP	Investigation of thyroid function: the number of TSH tests claimed (compared with the number of FT4 tests claimed)	New Zealand

**Table 5.8 Selected indicators of equity**

Source	Indicator summary	Organisation/country
PHO-PP	Doctor consultation rate for Māori / Pacific Islanders compared to non high need population	New Zealand
PHO-PP	Nurse consultation rate for Māori / Pacific Islanders compared to non high need population	New Zealand
QOF	Ethnic origin recorded for 100% of new registrations	UK/England
WCC	The Primary Care Trust can demonstrate health gains and reductions in health inequalities through achieving Local Area Agreement priorities	England
WCC	The Primary Care Trust identifies gaps in care and opportunities to improve services for populations on an ongoing basis	England
DGPP-NPI	Indigenous Health Incentive: Indigenous patients aged 15 years and over, registered with the practice for chronic disease management for a 12 month period	Australia

**Table 5.9 Selected indicators of comprehensiveness/coordination**

Source	Indicator summary	Organisation/country
AMA-PCPI	Percentage of patients aged 18 and older with a diagnosis of diabetic retinopathy who had a dilated macular or fundus exam performed with documented communication to the physician who manages the ongoing care of the patient with diabetes mellitus regarding the findings of the macular or fundus exam at least once within 12 months	US: CMS
EPA	Patients at risk are recalled	EPA
WCC	Multiple partnerships are in place across a broad range of settings to support and deliver the health and well-being agenda	England
QOF	The practice has a protocol for the identification of carers and a mechanism for the referral of carers for social services assessment	UK/England
EPA	Information (outcomes, results) about (unplanned) out-of-hours care provided by other doctors for patients is made available to practice staff	EPA
EPA	There is a team meeting held at least monthly and a written record is made available to all staff	EPA

**Table 5.10 Selected indicators of patient experience**

Source	Indicator summary	Organisation/country
EPA	The patients feel sufficiently involved in decisions about their medical care	EPA
WCC	The local population strongly agrees that the local NHS is improving services	England
AHS-PR	Patients' perception of access to healthcare	Alberta, Canada
OC	Percentage of the general population with high or very high confidence in primary care	Sweden
Internal	Reports how well doctors listen to their patients and explain things in a way they can understand	US: HealthPartners Minnesota
OC	Rheumatoid arthritis: patient reported health improvement six months after commencement of treatment, 2006–2008	Sweden

**Table 5.11 Selected indicators of management/organisation**

Source	Indicator summary	Organisation/country
DGPP-NPI	Proportion of practices participating in the Practice Incentive Programme	Australia
QOF	There is a system of alerting the out of hours service or duty doctor to patients dying at home	UK/England
DGPP-NPI	Proportion of general practices within (a) the Division and (b) the State using electronic register/recall/reminder systems to identify patients with a chronic disease for review and appropriate action	Australia
EPA	The practice monitors staff satisfaction regularly / Staff satisfaction is monitored regularly	EPA
PIP	Practice hosts undergraduate for teaching placements	Australia
Internal	Implemented and in use prior to Jan 1 2009 an electronic disease/patient registry system that must be able to produce lists of patients with chronic diseases/conditions, such as diabetes, and must be able to produce patient lists that can be used for patient recalls, follow ups, and other purposes.	US: Anthem Blue Cross

## 5.2 The context for quality measurement

The preceding section summarised the key findings of our review of quality indicators in current use, highlighting some of the limitations of existing sets of indicators. This section discusses the context for quality measurement. In particular, it highlights some of the practical issues that need to be considered for the development and implementation of any indicator system.

### 5.2.1 Should quality measurement be clinically or managerially led?

Quality improvement systems can be designed 'top down' by healthcare managers or come from quality improvement needs identified by the clinicians who deliver care, and practices vary across countries.<sup>16</sup> Top down imposition of quality indicators without adequate involvement of care providers risks antagonising clinicians, especially if the quality indicators are seen as distracting them from providing the care their patients need. If that occurs, quality measurement can have serious negative effects on internal motivation and professionalism. It is therefore important that physicians are closely involved in the

development and/or selection of quality measurement or quality improvement schemes (Box 5.3).

**Box 5.3 Capacity requirements for healthcare quality measurement and improvement**

Measuring and improving quality of care requires a new set of skills that are not generally found among health professionals, e.g. in medical schools; indeed they are only just starting to be taught about quality of care. These skills include how to measure quality and how to improve. Therefore, any quality improvement programme has to address capacity building so that physicians and administrators have the appropriate set of skills. Substantial investment has been made in these areas, for example by the Institute of Healthcare Improvement in the US ([www.ihl.org](http://www.ihl.org)) and the Health Foundation in the UK ([www.health.org.uk](http://www.health.org.uk)). The websites of these organisations provide details of the types of scheme that have been developed in order to provide the healthcare workforce with the knowledge and skills to carry out successful quality improvement programmes.

**5.2.2 Should information on quality be made publicly available?**

There is growing interest in the public release of information on the quality of healthcare delivered by identified providers.<sup>84</sup> This development can be seen to be located within broader concerns about accountability of health systems with public reporting seen as a means to promote high quality, efficient healthcare delivery.<sup>53 85</sup>

Berwick et al. (2003) described two principal pathways through which measurement and reporting can improve quality.<sup>86</sup> In one pathway, information on quality provides different users (patients, purchasers, regulators) with knowledge that will enable them to select providers according to quality criteria ('improvement through selection'). In the second pathway, information on the quality of care is expected to help providers identify areas of underperformance and so encourage behaviour change ('improvement through change').

The evidence of whether the public release of performance data improves quality of care remains somewhat inconsistent, however,<sup>12</sup> in part because of the lack of rigorous evaluation of many major public reporting systems. Evidence from the US suggests that users as well as purchasers or payers rarely search out publicly available information and do not understand or trust it.<sup>87</sup> Also, physicians appear to be sceptical about the data and only a small proportion appears to be using them. In contrast, growing evidence suggests that managers and some providers do use comparative information, with data from the US indicating that hospitals appear to have been most responsive to publicised data, with some evidence pointing towards improvements in care and selected patient outcomes where public reporting occurred.<sup>88-90</sup>

Several authors have highlighted the risk of unintended consequences of the systematic reporting of information of quality of care delivered by healthcare providers. One example includes providers avoiding high-risk cases in an attempt to improve their quality ranking, a phenomenon already documented by Florence Nightingale in the 19th century. Also, as noted earlier, public reporting may result in providers focusing on improving those indicators that are reported on, such as waiting times, while diverting attention away from other, non-reported areas.<sup>53</sup> As a consequence, public reporting may inadvertently reduce, rather than improve, quality.<sup>91</sup>

Thus, any system designed to report systematically on quality must be developed carefully so as to ensure that reporting indeed leads to quality improvement.<sup>92</sup> If a system of public

reporting on the quality of care provided by office-based doctors in Germany is to be considered, it will therefore be crucial to identify a priori what a system of public reporting is aimed at achieving. If the aim is to improve transparency and accountability, it may not be necessary to identify areas where quality of care is poor. Indeed, granted that the quality of care in Germany is very high, one might specifically choose areas where care is known to be good, especially if they are thought to represent quality of care as a whole. This approach is more likely to engage physicians in the process of quality measurement.

If the aim is to improve quality in areas where it is believed to be poor, then aspects of care and/or geographic areas will be chosen where there are believed to be problems with quality. In contrast to the first approach, the aim is specifically to identify areas of poor quality so they can be addressed. Especially for physicians who are not used to quality measurement, this approach will be much more challenging.

In a system where physicians are not in general familiar with routine quality measurement, a combination of these two approaches is likely to maximise engagement while at the same time allowing for quality improvement initiatives to be introduced.

### 5.2.3 **Should doctors be able to exclude individual patients from quality measurement?**

When using performance measures in ‘high stakes’ applications, consideration should also be given to allowing doctors to exclude patients from a quality calculation if they do not believe that a particular indicator applies to that patient. This can help avoid physicians delivering care that is inappropriate and that would thus lead to the misallocation of resources. A challenge in allowing ‘exception reporting’ is that it can lead to gaming (when providers set aside difficult cases in order to gain financial rewards), and audits will be required to ensure that providers are using exceptions appropriately.

The concept of exception reporting has only been rolled out on a large scale within the UK Quality and Outcomes Framework (QOF) where GPs have the ability to ‘exception report’ patients. The rationale for this was that clinical guidelines were never intended to apply to every patient. To take an extreme example, one would not expect a physician to try and control the cholesterol of a patient who is dying of liver cancer. Instead, the scheme in place in the UK takes account of a doctor’s own clinical judgement when considering the appropriateness of a given indicator to individual patients (Box 5.4) and so increasing ‘buy in’ by physicians, since they do not feel they are being given an incentive to do something that might not be in their patient’s best interest.

The risk is that physicians might exclude patients inappropriately, e.g. exclude patients whose condition is difficult to control in order to improve their indicator ratings. The evidence from the UK suggests this is not a widespread problem, with an average of 5% of patients excluded by physicians in this way.<sup>93</sup> However, although the average is low, individual rates of exception reporting vary widely across UK practices. Exception reporting rates of UK doctors are however published, and they are subject to external scrutiny<sup>94</sup> so identifying practices or physicians who appear to be excluding a high proportion of patients.

#### **Box 5.4 Reasons for 'exception reporting' within the UK Quality and Outcomes Framework**

Reasons that physicians can document when excluding a patient from reporting are:

- (a) Patients who have been recorded as refusing to attend review and who have been invited on at least three occasions during the preceding twelve months.
- (b) Patients for whom it is not appropriate to review the chronic disease parameters due to particular circumstances e.g. terminal illness, extreme frailty.
- (c) Patients newly diagnosed within the practice or who have recently registered with the practice, who should have measurements made within three months and delivery of clinical standards within nine months e.g. blood pressure or cholesterol measurements within target levels.
- (d) Patients who are on maximum tolerated doses of medication whose levels remain sub-optimal.
- (e) Patients for whom prescribing a medication is not clinically appropriate e.g. those who have an allergy, another contraindication or have experienced an adverse reaction.
- (f) Where a patient has not tolerated medication.
- (g) Where a patient does not agree to investigation or treatment (informed dissent), and this has been recorded in their medical records.
- (h) Where the patient has a supervening condition which makes treatment of their condition inappropriate e.g. cholesterol reduction where the patient has liver disease.
- (i) Where an investigative service or secondary care service is unavailable.

An alternative used in the US, where exception reporting has not been used, is to set performance targets; often these are set based on the 90th percentile of current performance, which is viewed as achievable, but it does not require that 100% of patients receive the service.

#### **5.2.4 What sources of data are available for measuring quality of care?**

Routinely collected data, such as claims data, or encounter data, have become very popular for quality measurement.<sup>95</sup> These data can be used retrospectively and enable compilation of data sets extending over longer time periods. Routinely collected data are typically low-cost as the data are being collected already for other purposes. They provide a rich source of information on a large number of patients with different health problems across diverse settings and/or geographical areas. Data typically capture information on diagnoses, services delivered, place of services and charges based on standardised codes. Their content makes them suitable to capture processes of care linked to payment (e.g. maintenance treatment given for asthmatics, vaccination rates and cancer screening rates) and health outcomes that are reflected in diagnosis, such as myocardial infarction.

At the same time, however, there are considerable limitations of these sources. For example, they tend to lack the level of clinical detail required to assess many aspects of quality. Thus, administrative data may capture an office visit for a patient with coronary heart disease but not whether the patient was counselled on smoking cessation. Physiological parameters such as blood pressure are typically not recorded, reducing the ability to use administrative data to construct intermediate outcome measures, such as adequate blood pressure control. These problems are illustrated in a US study in which 182 quality indicators were developed to assess 22 conditions relevant to geriatric care, but only 37 could be constructed from administrative data.<sup>96</sup> Overall performance was 83% on the 37 indicators derived from administrative data, but only 55% when a medical record was used to assess all 182 indicators.

Other problems include potential changes in reporting practices over time, which may falsely suggest improvement or deterioration in a given indicator.<sup>95</sup> Differences in data collection methods between providers, regions and systems may also lead to bias.

The UK is one of the few countries that has designed its national electronic medical record systems specifically to assess quality of care as part of its pay for performance scheme. While this is a considerable step forward in providing information on quality of care, the requirement routinely to code clinical information brings its own problems, such as the need to train doctors, to lengthen consultations to record data, the risk of gaming or fraud, and so on.

#### 5.2.5 **The importance of the denominator**

Most indicators are expressed as the number of events in a defined population. Defining the event correctly (implementing valid definitions for the numerator) is often easier than selecting the correct denominator (identifying the correct population to which the indicator should be applied). As outlined above, events are typically identified based on diagnoses and medical services and can usually be operationalised with clinical input in a fairly unambiguous manner. But identifying the correct population is difficult in situations in which no clear assignment of patients to providers exists, such as the registration with a GP. In those cases the development of algorithms, so-called attribution rules, which assign responsibility for a given patient to given provider(s), is required. For example, the US Medicare program attributes patients to primary care physicians based on a plurality rule.<sup>97</sup> A provider is identified as being responsible for a patient if that patient had at least one office visit to this provider. If a patient had two or more office visits with more than one provider, the provider with the most office visits, and in the case of a tie, the provider with the most recent visit, is selected. However, where data are available for the whole of a defined geographical population, then the denominator is more clearly defined (although in this case it may sometimes be difficult to ensure that all events in the numerator have been captured).

#### 5.2.6 **Knowing the baseline**

If there are plans to commit significant resources to quality improvement, for example through a pay for performance scheme, it is essential to measure quality before the introduction of such a system. This step was ignored by the UK government when it introduced a pay for performance scheme for primary care doctors (the QOF) in 2004 (see also Section 6.4.3). It was not aware of how much quality had already been improving before the introduction of the incentive scheme.<sup>3</sup> As a result, the NHS had to pay out much more than anticipated as doctors very rapidly achieved the maximum scores possible.<sup>98</sup>

#### 5.2.7 **Moving from individual indicators to sets of indicators or aggregate scores**

Individual indicators can be combined and weighted to create a composite measure. For example, one can aggregate individual measures of diabetes care to form a composite measure of the quality of diabetes care.

The weighting of indicators presents conceptual as well as practical problems, however. There are two main alternatives: formative or empirical weighting.<sup>99</sup> Empirical weighting is based on statistical and distributional characteristics of the data while the formative

approach is essentially based on clinical judgement. It is important to conduct sensitivity analyses to test the impact of setting different weights. Generally, physicians tend to want to weight more heavily the things that are clinically more important to do.

The formative approach can be further distinguished into:

- Weighting by the work required to achieve specific quality targets. This is the approach taken in the UK QOF because that scheme was developed as part of national pay negotiations for GPs and so was designed to reflect the effort that doctors would have to make to achieve the quality targets.
- Weighting by health gain. This takes a public health approach, which has often been advocated<sup>100-101</sup> but which we have not seen explicitly applied to pay for performance schemes.
- Explicit weighting of policy priorities.

Romano and colleagues (2010) provide an overview of the different types of formative approaches to construct composites,<sup>99</sup> based on work by Reeves et al. (2007).<sup>102</sup> This overview is reproduced in Table 5.12.

**Table 5.12 Types of scoring methods for composite indices**

Scoring method	Definition	Example	Adopting organisation
All or none	Percentage of patients for whom all indicators triggered by that patient are met	'Appropriate Care measure' for four conditions; patients must receive all identified interventions for a condition to be included in the numerator	Pennsylvania Health Care Quality Alliance's Progress and Performance Report of Hospital Quality
70% standard	Based on all or none with less strict criteria; 70% or more of indicators must be triggered	Not known	
Overall percentage (opportunity weighting)	Percentage of all audited care events that are met, where each opportunity to 'do the right thing' counts equally	149 hypertensive triggered 26 hypertension indicators 828 times; required care was given 576 times, which yields 69.6%	US: Centers for Medicare & Medicaid (CMS) Pay for Performance Premier Quality Incentive Demonstration Project
Indicator average (equal indicator or event weighting)	For each indicator, the percentage of times the indicator was met is computed; scores are averaged across all indicators, which represents the mean rate at which each aspect of care was met	Hospital quality of care for acute myocardial infarction, congestive heart failure and pneumonia is rated by averaging multiple indicators within each clinical domain	US: Hospital Quality Alliance
Patient average (equal patient weighting)	The percentage of triggered indicators successfully met is computed for each patient; scores are averaged across all patients to represent the mean percentage of audited aspects of care met for each patient	Not known	
Expert opinion (evidence based)	Each indicator is weighted based on the evidence of its impact on population health or evidence of effort required to achieve it	QOF or GP contract, which pays physicians more for achieving targets that require more time and other resources	UK: NHS

SOURCE: Based on Romano et al. (2010)<sup>99</sup>

### 5.2.8 Should indicators be developed nationally or locally?

Sets of quality indicators can be developed and implemented nationally or regionally with different advantages and disadvantages.

Developing a single set of national quality indicators allows for standardisation of indicators across the entire country, and therefore the quality of care provided provided by different regions to be compared. The drawback of this approach is that opportunities for local buy-in are limited, and there will be limited scope for the development of indicators that are targeted at meeting the needs of particular populations in a given region. A national approach has for example been adopted by the New Zealand Primary Health Organisation (PHO) Performance Management Programme, with providers noting limitations about competing national priorities at the practice level (see Section 6.5.3).

Allowing quality indicators to be locally developed will increase buy-in from local physicians and stakeholders, but this has two major limitations. First, it severely restricts comparability of data across localities or regions. Second, local organisations are unlikely to have the technical skills to develop clear and unambiguous indicators. Considerable skill is required to develop good quality indicators, and in most countries these skills are not widely distributed. Furthermore, allowing for indicators to be developed locally has the potential to perpetuate geographic variations in care, which is one of the rationales for developing quality indicators and guidelines in the first place.

In practice an intermediate approach might be used by allowing localities to choose from a national basket of indicators. This allows a degree of buy-in while retaining some of the benefits of standardisation for all indicators to be developed nationally, but for regions to decide which indicators they will use to assess quality in their locality. There can, of course, be a core set of mandatory indicators, with localities being free to select their own additional indicators. This approach has been pursued in England within the NHS operating framework (see Section 6.4.3). It requires primary care trusts, which purchase the majority of care for their populations, to meet local needs and priorities within national standards and priorities; however, the system is currently undergoing change. Another example is the Australian National Quality and Performance System (NQPS), a performance management framework operating at the level of regionally organised divisions of general practice. It comprises a set of national performance indicators addressing five national priority areas, including prevention or early detection and multidisciplinary care, but also allows for regional priorities to be addressed through optional additional indicators (see Section 6.2.3).

Wherever indicators are developed, implementation remains the responsibility of local teams. It is important that a cadre of people (clinical and non-clinical) is developed who have these skills (see also Box 5.3 on page 29, on capacity development).

## 5.3 Development of a quality measurement framework for Germany

### 5.3.1 Indicators suitable for application at regional level

In this section we discuss indicators that could be applied at regional level, drawing on the indicators that we identified in this project (see the electronic appendix). We should emphasise that these indicators are discussed as illustrative examples for the actual indicators that would be included in any regional bundle. The actual selection process must have substantial input from within Germany in order to ensure that the indicators address problems of importance in Germany and can be implemented using available data. A large proportion of the indicators presented in the electronic appendix require detailed clinical data that are usually not captured in administrative data systems but need to be extracted from electronic medical records or abstracted from charts.

The KBV has a particular interest in indicators, which can be applied at regional level, and this section contains some comments on this approach (Table 5.13).

**Table 5.13 Examples of quality indicators that could be applied at regional level**

<b>Indicator</b>	<b>Comment</b>
<b>Mortality</b>	
Standardised mortality rates for cancer (e.g. breast, colon, lung)	Mortality may be seen as a measure of need or a measure of quality. Five-year mortality/survival rates are often used as a measure of quality of care when comparing countries. One-year mortality/survival rates are more dependent on the stage of diagnosis, so may depend on patterns of late presentation in the population. Survival rates need to be interpreted in the context of mortality and incidence <sup>8</sup>
Standardised mortality rates for CVD/ischaemic heart disease. Premature mortality (under 75 years)	As with cancer mortality, CVD mortality may be seen as a measure of need or a measure of quality of care. Change in mortality is potentially more valuable as a quality measure, though may be determined by factors outside the healthcare system. The literature on avoidable mortality frequently considers only about 50% of ischaemic heart disease deaths as amenable to healthcare <sup>90</sup>
Five-year survival rates for patients with renal replacement therapy	Case mix adjustment may be important for this type of indicator to avoid providers selecting low risk patients ('cream skimming')
Infant mortality: deaths per 1,000 live births under 1 year old	Combines neonatal and postneonatal deaths, which are differentially sensitive to healthcare quality
Neonatal mortality: deaths within 28 days per 1,000 live births	Mortality in the first four weeks of life is frequently considered more sensitive to the quality of healthcare than infant or postneonatal mortality, with the latter more strongly associated with socio-economic factors <sup>103</sup>
Number of suicides and deaths with undetermined intent per 100,000 inhabitants	Suicide mortality is used by some authors as an indicator of healthcare quality and included in indicator lists of mortality considered amenable to healthcare <sup>104</sup>
<b>Morbidity</b>	
Patients with avoidable hospitalisations per 100,000 inhabitants, age and gender standardised	There is some evidence that emergency admissions for 'ambulatory care sensitive admissions' may reflect access to and quality of ambulatory care
Incidence of end stage renal disease (ESRD) among persons with diabetes aged 20 years or older	May be regarded as a measure of quality or a measure of need. Reduction on mortality would produce a paradoxical increase in incidence of ESRD
Number of live and still births where babies have weighed less than 2,500 grams	
Teenage pregnancy rate	Likely to be heavily dependent on socio-demographic characteristics of population. Change in indicator may be a measure of quality of health services, also determined by a other services, including education
<b>Population screening/prevention</b>	
Proportion of female patients aged 20–49 who have had a pap smear in the previous 3 years	
Proportion of female patients aged 50–69 who have had mammography screening in the previous 3 years	
Proportion of people age 50–74 who have had screening for colorectal cancer	
Antenatal care and screening are offered according to current local guidelines	Can record institutional compliance with guidelines of indicators like this as 'Yes' or 'No' but monitoring of performance may require more detailed information from individual patients
Child development checks are offered at intervals consistent with national guidelines and policy	Can record institutional compliance with guidelines of indicators like this as 'Yes' or 'No' but monitoring of performance may require more detailed information from individual patients

Children age 3–5 who received a well care visit during the measurement year.

Influenza immunisation rate per 100 population (age 65 years and over)

Proportion of children who complete MMR immunisation by their 2nd birthday

Percentage of women known to be smokers at the time of delivery

Likely to be heavily dependent on socio-demographic characteristics of population. Change in indicator might be a measure of quality of health services

Percentage of women aged 15–24 screened or tested for chlamydia

**Indicators relating to individual clinical conditions/groups** (These are only examples: the great majority of indicators in the appendix relate to individual clinical conditions)

Percentage of patients with atrial fibrillation diagnosed after 1 April 2008 with ECG or specialist confirmed diagnosis

This type of indicator requires data from individual patient records, which are then aggregated to regional level

Percentage of patients with atrial fibrillation who are currently treated with anti-coagulation drug therapy or an anti-platelet therapy

This type of indicator requires data from individual patient records, which are then aggregated to regional level

Percentage of patients with COPD who have had influenza immunisation during preceding period

Other conditions might be included, e.g. diabetes, heart failure

Percentage of patients aged 18 years and older with a diagnosis of COPD who received pneumococcal immunisation in the previous 15 months

Percentage of patients with newly diagnosed angina who are referred for exercise testing and/or specialist assessment

Percentage of patients with a history of MI who are currently treated with an ACE inhibitor or Angiotensin II antagonist

Percentage of people with diabetes who had an eye examination with an eye care professional (ophthalmologist or approved optician) in the previous year

Investigation of thyroid function: the number of TSH tests claimed compared with the number of free T4 tests claimed

This type of indicator can be used when there is a clear preference for one type of treatment/investigation over another (in this case TSH over serum thyroxine)

Polypharmacy: average number of different drugs (classified by generic drug name) prescribed for long-term care home residents

This indicator could also relate to an age group, e.g. patients over 70

Proportion of nursing home residents receiving prescription for benzodiazepines

This type of indicator is suitable for clinical activities that should be discouraged. It could also relate to an age group, e.g. patients over 70

Percentage of patients with a diagnosis of heart failure, which has been confirmed by an echocardiogram or by specialist assessment

Percentage of patients 18 years and older with a diagnosis of heart failure and LVSD (LVEF < 40%) who were prescribed an ACE inhibitor or ARB therapy

Percentage of patients with hypothyroidism with thyroid function tests recorded in the previous 15 months

Percentage of patients with diabetes with HbA1 recorded in the previous 15 months

Percentage of patients with a primary diagnosis of low back pain who did not have an imaging study (plain x-ray, MRI, CT scan) within 28 days

Uncommon type of indicator used to discourage clinical activities (in this case to reduce over-investigation)

of diagnosis

Percent of members 3 months to 18 years old who were given a diagnosis of upper respiratory infection and were not dispensed an antibiotic prescription on or three days after the date of upper respiratory tract infection (URI) diagnosis

This type of indicator may encourage 'coding drift', e.g. recording a diagnosis of otitis media rather than URI when an antibiotic is prescribed

End of life care: proportion of all deaths that occur at home

Indicator commonly used as a measure of the quality of care at the end of life

### ***Patient experience***

Self-reported patient/user experience defined by:

- access and waiting
- communication with doctor
- safe, high quality co-ordinated care
- clean, friendly, comfortable facilities
- good information
- involvement in decisions about care.

Patient experience indicators generally require bespoke surveys to be developed

Patient perception of overall quality of healthcare received

### ***Organisation/management***

Patient satisfaction with handling of complaints

Translator services are available on request

Physicians have direct access to clinical guidelines (either on paper or electronically) in the consultation room

There are arrangements with other providers to ensure continuity of care

There is an electronic medical record that allows patients with particular diseases (e.g. diabetes, hypertension) to be identified

There is an electronic medical record that allows quality of care to be measured for patients with particular diseases (e.g. blood pressure levels for people with hypertension, cholesterol levels for people with diabetes)

The selection of the actual quality indicators, for example by KBV, needs to reflect the particularities of the German delivery system, stakeholder expectations and perceptions of highest priority improvement opportunities. For this reason it will be critical to include physicians and other stakeholders in prioritising and selecting measures. Thus, any quality framework developed for Germany will depend on:

- data availability (and willingness to invest in data capture, e.g. through electronic medical records or dedicated data collection)
- regional and/or local perceptions of the need for quality improvement
- societal norms, especially in relation to the relative importance of some aspects of care.

Work undertaken in other countries can inform decisions for Germany. Lists of indicators such as those reviewed here offer a range of possibilities to include in a framework for the KBV. There are also well-tested methods for combining evidence with local professional opinion to select quality indicators sensitive to the needs of individual countries. However, because of the importance of incorporating local priorities and local context, the work in

developing a German framework has ultimately to be carried out in Germany, preferably with substantial input from German physicians and other stakeholders.



## CHAPTER 6 **Quality indicators in resource allocation in four countries**

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### 6.1 **Experiences of resource allocation models in four countries**

This chapter describes resource allocation models in Australia, Canada, England and New Zealand. It outlines the principal structures and processes of allocation mechanisms in the ambulatory care sector, and the extent to which quality indicators have been, or are being, considered in the process. We place these experiences in the context of wider health system features of the countries under review to better understand the objectives behind relevant initiatives, specific factors (if any) that have enabled, or indeed hindered, systems to achieve set aims, as well as efforts to develop existing approaches further.

This section provides a high-level summary of key observations from the four countries reviewed. A detailed description of mechanisms in place in each is presented in sections 6.2-6.5.

#### 6.1.1 **Summary of observations**

The use of quality or performance indicators in 'high stakes' assessments is mostly in the form of accountability frameworks that involve public reporting in all four countries, with systems that utilise quality indicators as part of pay for performance schemes in the ambulatory care sector in place in Australia, England and New Zealand.

Operating at national (Australia, England, New Zealand) or regional level (Canadian provinces), accountability frameworks reviewed here vary in nature, scope and level of implementation. For example, the National Quality and Performance System (NQPS) in Australia, introduced in 2005, is a performance management framework targeted at the level of regional divisions of general practice. It involves a set of nationally defined performance indicators, which aim at improvements in five priority areas, including prevention and early intervention, access, integration and multidisciplinary care, and management of chronic disease, with the option of additional indicators to allow for regional priorities to be addressed. The NQPS intended to link the allocation of resources to achievement of agreed targets; however, to date the system is still essentially set up as a reporting framework.

In Canada, several provinces operate regional performance assessment frameworks, including Alberta, Ontario and Saskatchewan. Within these provinces, indicators are used as part of the accountability responsibilities to provincial governments of regional

organisations that purchase and/or deliver healthcare. One example is Ontario's Cancer System Quality Index (CSQI), which comprises 32 evidence-based quality measures in the area of cancer care. Data is made available publicly although reporting is on aggregate results only; local and facility-specific data are reported internally. Indicator development involved multiple stakeholders and it has been noted that because the CSQI included clinicians in indicator selection and publicly reports only on indicators that have been used internally for a number of years, it has encouraged change by identifying quality gaps.

In England, primary care trusts (PCTs), which purchase the majority of care for local populations, are required to meet local needs and priorities within a national NHS operating framework, which defines national standards and sets out priorities for service delivery. In 2010/11, national priorities included for example improving access to ambulatory specialist care; improving population health and reducing health inequalities; and improving patient experience. The programme also includes an annual process that reviews PCTs' progress towards achieving better health outcomes for their populations and provides a common basis for agreeing further development.

Similar to England and Canadian provinces, the regional purchasers of healthcare in New Zealand, the district health boards (DHBs), are held accountable through a performance measurement and reporting system. One of the four dimensions of performance assessed within that framework focuses on outcomes, involving 15 specific indicators DHBs report on quarterly, so enabling the Ministry of Health to identify areas of deficiency and need for improvement.

With the possible exception of Ontario's Cancer System Quality Index there is little documented evidence of the impact of the reporting systems described above.

This is in contrast to the use of quality indicators as part of pay for performance (P4P) schemes operating in Australia, England and New Zealand. Thus, in Australia, the Practice Incentives Program (PIP), introduced in the late 1990s, offers financial incentives for general practices to support quality care and so improve access and health outcomes. It includes capitation payments for practice infrastructure and a P4P element to encourage higher quality of care in specific areas. In England, as in the UK as a whole, a P4P scheme, known as the Quality and Outcomes Framework (QOF), has been in place in general practice since 2004. Its aim was to reduce the wide variation in payments to practices, to fairly link reward to workload, and to help reduce health inequalities. In New Zealand, a Primary Health Organisation (PHO) Performance Management Programme was introduced in 2006, designed to improve the health of populations and reduce inequalities in health outcomes. PHOs participating in this scheme receive additional funding for achieving a range of national indicators.

There is evidence of impact for all three schemes. Thus, the PIP scheme in place in Australia was rated as successful in increasing the availability of out-of-hours care and the participation in incentivised programmes such as immunisation. There was also evidence of improvements in diabetes care (processes), in particular for higher need populations. Importantly, a considerable part of observed improvements on indicators of infrastructure was linked to practice support received from regional associations (divisions of general practice), in particular reduced administrative costs and improved communication and

electronic transfer of data, although there were no significant effects on clinical performance in relation to support by regional organisations.

In England, the QOF, which accounts for 25% of general practitioners' income, was shown to have led to rapid and universal adoption of electronic records by GPs. There was evidence of an increase in the rate of quality improvement for major chronic diseases and of the scheme having an effect in reducing inequalities in the delivery of primary care. As QOF data are publicly reported, this has been seen to act as an additional incentive to doctors to improve care. However, observed improvements within QOF have to be set against a background of care that was already improving rapidly and within two years of the new incentives, the rate of improvement had flattened.

In New Zealand, the PHO Performance Management Programme was generally perceived as positive while highlighting a number of limitations. For example, there was a perceived mismatch between programme indicators set nationally and those seen of importance at practice level. There was also concern about the potential that a focus on programme indicators might divert attention of providers from other equally important components. This observation was made within the QOF in the UK, showing that an incentive to reduce waiting times for appointments with general practitioners had the perverse effect of introducing over-rigid booking systems.

The timely availability of data was also noted as crucial to inform improvement, highlighting the need to invest in relevant systems. In the UK, QOF data are collected automatically from GP electronic medical records through an IT system, which was developed at national level, the Quality Management Analysis System (QMAS).

An overall assessment of the impact of the UK pay for performance (P4P) scheme is that P4P should not be seen as a 'magic bullet' for quality improvement. The quality of primary care in the UK has improved dramatically over the last ten years, especially in the management of major chronic conditions. However, this has been a result of a series of sustained policies, including the development of national guidelines, local audits with feedback, annual appraisal of all doctors working in the NHS, and public release of information on quality of care.

## 6.2 Australia

### 6.2.1 Healthcare system context

In Australia, healthcare funding, service provision and regulation is shared between the Commonwealth, the six states and two self-governing territories (hereafter: the states) and local government. Medicare Australia is the national authority responsible for processing and dispensing benefits; state health departments administer public hospitals and public health.<sup>105</sup>

In 2007, 67.5% of total health expenditure was funded from general taxation, 7.8% from private insurance, 18% from out-of-pocket payments and 6.6% from other sources.<sup>106</sup> The tax-funded public Medicare programme, established in 1984, provides health insurance for all citizens, with full or partial coverage of all medical services including hospitals stays according to a fee schedule (Section 6.2.2). About 43% of the population has taken out private health insurance<sup>107</sup> to cover treatment as a private patient in hospital and for additional services such as dental care and physiotherapy;<sup>105</sup> uptake is promoted by the federal government and subsidised by its tax policy.<sup>108</sup>

About two-thirds of hospital beds in Australia are public, owned and operated by state and territory governments with the remaining 30% in the private for-profit and non-profit sector.<sup>106 109</sup> Just under 40% of physicians are primary care practitioners<sup>110</sup> in private practice; specialists work in public and/or private hospitals and private practices.<sup>111</sup> Physicians in public hospitals are either salaried (with options to undertake limited private practice) or combine private medical practice with a visiting medical officer engagement at one or more public hospitals.<sup>112</sup> Physicians working in private hospitals are in private practice and do not concurrently hold salaried positions in public hospitals.

Patients have free choice of GPs who act as gatekeepers to specialist care in so far as Medicare will reimburse specialists only the schedule fee payment for referred consultations.<sup>105</sup> GPs may establish their practice where they wish. The number of solo practices has declined over time, and multi-GP practices now constitute the majority.<sup>113</sup> In 1992, divisions of general practice were established to encourage GPs to collaborate and form links with other health professionals to improve the quality of health service delivery to local communities.<sup>113-114</sup>

### 6.2.2 Resource allocation in the ambulatory care sector

Resource allocation in the Australian healthcare system is mainly determined by the Commonwealth's commitments under three schemes: Medicare, the Pharmaceuticals Benefits Scheme (PBS) and the Australian Health Care Agreements.<sup>105</sup> Medicare reimburses non-hospital generalist and specialist medical care delivered in private practice while the Australian Health Care Agreement, co-funded by the states, finances public hospitals and public health services. States fund community-based services.

Cost sharing between Commonwealth and states under the Australian Health Care Agreement is negotiated five years in advance; since 1984 the division of cost sharing has on average been at 50%, although in 2007/08 contributions by the Commonwealth were

at 40%.<sup>111 115</sup> Allocations from the Commonwealth to the states are based on a population formula plus components of performance measurement.<sup>105</sup>

All state health departments negotiate funding agreements with area health boards or with hospitals and other healthcare providers, but they differ in the way they allocate funds. Allocation formulas include various elements, for example historical funding, population-based formulas weighted for age and sex, adjustments for resource use, and activity-related measures such as casemix.<sup>105</sup> State departments of finance then determine how funding is distributed to hospitals and other healthcare services. States use case-mix indicators as a mechanism for resource allocation and for tracking the performance of hospital care.<sup>115</sup> All states negotiate financial agreements with the hospitals or hospital groups in the form of prospective budgets, with fee and volume agreements negotiated with pathologists and radiologists.<sup>105</sup> The conditions and rates of payment of doctors working in public hospitals vary across states, with those in full-time employment receiving a salary while visiting medical officers are independent contractors to the hospital and are paid on a per session basis for treating public patients.

Office-based physicians in private practice are paid on a fee-for-service basis, with generalist and specialist services either fully or partly reimbursed based on the Medicare Benefits Schedule. All Australians are eligible for a full rebate of the schedule fee for general practitioner services; 85% of the schedule fee for other out-of-hospital services including specialist consultations; and 75% of the schedule fee for inpatient medical services. Recognised specialists can claim a higher rebate when the patient is referred by a medical practitioner.<sup>105</sup> The Medicare fee schedule is set by the Commonwealth.

Doctors may charge more than the Medicare fee, which leaves the patient with a copayment plus any additional charges, the so called 'gap'.<sup>111</sup> Although the Medicare Benefits Schedule is very explicit and leaves little room for interpretation by the physician,<sup>116</sup> private practitioners may in principle charge patients what the market will allow as there are no price controls.<sup>117</sup> However, the Australian Medical Association (AMA) provides guidance on what fees can be charged for services provided. Doctors may also choose to accept 100% of the Medicare Benefits Schedule fee as full payment, in which case Medicare will pay the benefit directly to the doctor (bulk-billing). In 2005, bulk-billing for general practitioner services accounted for about 75% of all services.<sup>105</sup>

The fee schedule for general practitioners is based on payment for each consultation provided, with the fee increasing with level of complexity and consultation length (four levels). In 2008, fees ranged between AUS\$ 15 and AUS\$ 91.70.<sup>117</sup> GPs may also be paid a small amount (in relation to their overall income) to deliver agreed public health services.<sup>105</sup>

In 1999, the Enhanced Primary Care (EPC) package was introduced to promote the provision of coordinated care.<sup>118</sup> Among other things it allowed for additional payments under the Medicare Benefits Schedule for annual health checks for older people and for multidisciplinary care planning and case conferencing. This followed the introduction of the Practice Incentives Program (PIP) in 1998, adding a performance-related component to the fee-for-service reimbursement in general practice (Section 6.2.3).<sup>119</sup> Service Incentive Payments (SIPs) were introduced from 2001–2002 to target improvements in the prevention and treatment of chronic diseases. The method by which divisions were funded

changed in 1998 from short-term infrastructure grants to outcomes-based formula reflecting GP workload, rurality and socio-economic status.<sup>120</sup>

### 6.2.3 Quality indicators in resource allocation

There are two major nationwide mechanisms that introduce quality indicators into resource allocation. These are the National Quality and Performance System (NQPS) introduced in 2005 at the level of divisions of general practice and the Practice Incentives Program (PIP) at individual practice level (with the Service Improvement Payments (SIP) at individual practitioner level). These efforts are primarily targeted at strengthening and improving multidisciplinary care as a means to improve chronic care.<sup>121</sup> At the state level, in 2007/08, Queensland introduced the Clinical Practice Improvement Payment (CPIP) as a new hospital funding model with a pay-for-performance (P4P) element. Areas addressed by the CPIP include mental healthcare through rewarding the timely follow-up to improve patient safety, stroke (reducing death and dependency), emergency care (improving communication with GP and nursing homes), and hospital discharge (information for patients with complex medication requirements).<sup>122</sup>

The NQPS for divisions of general practice is a performance management framework that aims at increasing accountability and improving performance in line with the ideal of continuous quality improvement. It comprises three mechanisms: a set of national performance indicators, a requirement for accreditation and a process of performance assessment. The national performance indicators aim at improvements in five national priority areas: governance, prevention and early intervention, access, supporting integration and multidisciplinary care, and better management of chronic disease.<sup>118</sup> The NQPS allows for regional priorities to be addressed through optional additional indicators. Indicators were developed at four levels: organisational, practice, community/family and patient. Indicators are supported by a points system with the intention that allocation of resources to the divisions would ultimately be related to achievement of agreed targets. For example, an area 'earned autonomy' included reduced reporting requirements for high performers. In contrast, those not performing to expectation would qualify for development support, added to by competitive access to additional funds for divisions that were shown to have particular strengths in areas of work that could support improvement and build capacity in the network, through the establishment of a Performance and Development Funding Pool.<sup>114</sup> This pool was however only implemented in the first year and earned autonomy has not been implemented. Overall, the NPQS is still essentially set up as a reporting framework rather than as a measurement system.<sup>120</sup>

At the individual practice level, the Practice Incentives Program (PIP) offers financial incentives for general practices to support quality care and to improve access and health outcomes. It includes capitation payments for practice infrastructure and a pay-for-performance element to encourage higher quality of care in specific areas. PIP was introduced in response to perceived limitations of the fee-for-service payment system, which rewards practices with high patient throughput and short consultations.<sup>117</sup> Service improvement payments (SIPs) provide additional payments to GPs for completing asthma and diabetes cycles of care, cervical screening for under-screened women, and, until 2007, mental health.<sup>119</sup>

The basis for the PIP payment formula was developed in consultation with the General Practice Financing Group (GPF), a negotiating body bringing together the Australian government and the associations of general practitioners and of rural physicians.<sup>123</sup> PIP comprises a series of elements or incentives. The level of PIP payments a general practice will receive is determined by the particular incentive which is generally adjusted by<sup>119</sup>:

- the Standardised Whole Patient Equivalent (SWPE), which aims to measure a practice's patient load independent of the number of services provided to patients. It is based on the proportion of care a practice provides to each patient using the value of the patient's Medicare Benefits Schedule fees, which is then weighted using an age–sex factor. Over 75% of PIP payments to practices use the practice's SWPE as a determinant.
- the location of the practice as determined by the rural, remote, metropolitan area (RRMA) classification. Practices that are located in RRMA have a loading of 15–50% added to other PIP payments.

Table 6.1 provides an overview of the incentives and their aims in the PIP (see also appended Excel file for a detailed overview of PIP indicators).

**Table 6.1 Practice Incentives Program (PIP) incentives and aims**

	<b>Aim of incentive</b>
eHealth Incentive	To encourage practices to keep up to date with the latest developments in eHealth
After-hours Incentive	To encourage general practices to provide patients with access to quality after-hours care
Teaching Incentive	To encourage general practices to provide teaching sessions to undergraduate medical students, to ensure practitioners of tomorrow are appropriately trained and have actual experience of general practice
Quality Prescribing Incentive	To encourage practices to keep up to date with information on the quality use of medicines
Practice Nurse Incentive	To encourage general practices in rural and remote areas to employ practice nurses and/or Aboriginal health workers, and in urban areas of workforce shortage, to employ practice nurses and/or Aboriginal health workers and/or other allied health workers
Cervical Screening Incentive	To encourage general practitioners (GPs) to screen under-screened women, and to increase overall screening rates
Diabetes Incentive	To encourage GPs to provide earlier diagnosis and effective management of people with established diabetes mellitus
Asthma Incentive	To encourage GPs to better manage the clinical care of people with moderate to severe asthma
Procedural GP Incentive	To encourage GPs in rural and remote areas to maintain local access to surgical, anaesthetic and obstetric services
Domestic Violence Incentive	To encourage general practices in rural and remote areas to act as a referral point for women experiencing domestic violence
GP Aged Care Access Incentive	To improve access to primary care for residents of Commonwealth-funded aged care facilities
Rural Loading	To recognise the difficulties of providing care, often with little professional support, in rural and remote areas
Indigenous Health Incentive	To support general practices and Indigenous health services to provide better health care for Aboriginal and Torres Strait Islander patients, including best practice management of chronic diseases

SOURCE: Adapted from Australian National Audit Office (2010)<sup>119</sup>

To join the PIP, GP practices must, among other things, be accredited or registered for accreditation as a ‘general practice’ against the Standards for General Practice set by the Royal Australian College of General Practitioners (RACGP).<sup>124</sup> In addition to these entry requirements, there are eligibility requirements, which vary by incentive.

For example, the Diabetes Incentive is subdivided into three payments, a ‘sign on’ payment, an ‘outcome’ payment and a service improvement payment (SIP):<sup>19</sup>

- Sign on payment: practices are required to register for the payment and use a patient register and a recall and reminder system for their patients with diabetes (one-off payment only; approximately AUS\$ 1,000 per FTE GP).
- Outcome payment: registered practices must have at least 2% of their patients diagnosed with diabetes and their GPs must have completed a diabetes cycle of care for at least 20% of these patients (payment made only to practices where 20% of diabetics have completed an Annual Cycle of Care; AUS\$ 20 per patient with diabetes per year).
- Service incentive payment: GPs must work in a practice registered for the incentive, and complete cycles of care for patients with established diabetes mellitus (AUS\$ 40 per patient).

The annual cycle of care for diabetes includes assessment of HbA1c, blood pressure, lipids, weight, behavioural risk factors and screening for complications.<sup>118</sup> Table 6.2 provides an overview of the minimum requirements for diabetes care within an 11–13-month period that have to be met by GPs to qualify for the relevant PIP and SIP.

**Table 6.2 Minimum requirements of diabetes care under the Practice Incentives Program**

Activity	Frequency/description
Assess diabetes control by measuring HbA1c	At least once every cycle
Ensure that a comprehensive eye examination is carried out	At least once every two years
Measure weight and height and calculate Body Mass Index (BMI)	At least twice every cycle
Measure blood pressure	At least twice every cycle
Examine feet	At least twice every cycle
Measure total cholesterol, triglycerides and HDL cholesterol	At least once every cycle
Test for microalbuminuria	At least once every cycle
Provide self-care education	Patient education regarding diabetes management
Review diet	Reinforce information about appropriate dietary choices
Review levels of physical activity	Reinforce information about appropriate levels of physical activity
Check smoking status	Encourage cessation of smoking (if relevant)
Review of medication	Medication review

SOURCE: Adapted from Medicare Australia (2010)<sup>19</sup>

Only recently, the PIP was further expanded to include the Indigenous Health Incentive, incentivising GP practices to improving care for Aboriginal and Torres Strait Islander patients.

To further improve primary care structures and foster integration of services at the regional level, the Australian government intends to establish a network of primary healthcare organisations, the 'Medicare Locals', by 2011/12.<sup>125</sup> The performance of Medicare Locals will be assessed against agreed performance measures and standards to identify high performing organisations and facilitate sharing of innovative and effective practices.

#### 6.2.4 Experience of the mechanisms in place so far

Participation in the PIP is voluntary, but it is facilitated by the support of divisions of general practice. In 2008/09, PIP accounted for between 4% to just over 10% of practice income.<sup>119</sup> In 2009/10, general practices received AUS\$ 261 million through the programme with 4,881 practices participating (May 2010) and over 80% of general practice in Australia is delivered through PIP practices.<sup>119</sup>

The PIP has been evaluated with mainly positive results, but there are concerns about the quality of some evaluations, with few employing a controlled design.<sup>121</sup> Healy et al. (2006) reported that the PIP has been successful in increasing the availability of after-hours care, the training of medical students, the participation in incentivised programmes such as immunisation, and the adoption of information management systems.<sup>105</sup> For example, five years following the launch of the programme, 95% of PIP practices used computers for clinical purposes. Further evaluations have shown that general practices made measurable improvements in patient care and health outcomes. Thus, a recent study by Scott et al. (2009) found that in relation to diabetes care, the programme increased the probability of an HbA1c test being ordered by approximately 20%, with the effect being higher for patients from an Aboriginal and Torres Strait Islander background.<sup>126</sup> Regional divisions of general practice impacted on improving practice infrastructure; they played an important role in lowering the administrative costs associated with participating in the PIP.

Incentives to support the employment of practice nurses have also been taken up by GP practices. Between 2003 and 2005 there was an increase by 17% to 57% of all general practices employing one or more practice nurses, with over half located in regional, rural and remote areas.<sup>121</sup>

In its first year, the Indigenous Health Incentive supported around 850 general practices and Indigenous Health Services to provide better healthcare for indigenous Australians, including best practice management of chronic disease. Around 2,900 eligible patients have been registered so far.<sup>127</sup>

Activities at the division level had some influence on the improvement of a number of primary care performance measures in practices participating in PIP. From 2002 to 2004, between 19% and 64% of the total variation in each performance indicator could be attributed to divisions of general practice activities.<sup>128</sup> Divisions had a particularly strong effect on aspects of performance related to practice infrastructure, such as the communication and electronic transfer of data, but there were no significant effects on performance related to clinical activities conducted by GPs, such as claims for service incentive payments for asthma, diabetes or cervical cancer screening.

## 6.3 Canada

### 6.3.1 Healthcare system context

In Canada the ten provinces and three territories have primary responsibility for funding, service provision and regulation of healthcare. The federal government is responsible for protecting the health and security of Canadians by setting standards for the national Medicare system, and for ensuring that provinces follow the principles of healthcare as set out in the 1984 Canada Health Act.<sup>129</sup> In 2009, about 70% of total healthcare financing derived from general taxation, 13% from private insurance and 15% from out-of-pocket payments, with only 1.4% funded from social insurance contributions.<sup>106</sup>

Canadian Medicare is a public single-payer scheme providing universal access to all physician and hospital services defined as medically necessary by the Canada Health Act. In addition, provincial and territorial governments provide varying levels of supplementary benefits for particular population groups (children, senior citizens and social assistance recipients) and services, such as prescription drug coverage, eye care, dental care and home care.<sup>130</sup> About two-thirds of Canadians have supplementary private insurance coverage, mainly employment-based. Almost all Canadian hospitals are non-profit facilities. Physicians are usually self-employed in private practices.<sup>131</sup>

In most provinces and territories, healthcare is primarily organised by regional health authorities (RHAs), which coordinate and deliver services to a defined geographic population.<sup>130</sup> Hospitals generally operate under annual global budgets, negotiated with the regional health authority.<sup>129</sup> Provincial governments also negotiate remuneration for physicians' services with provincial medical associations. Physicians are generally remunerated on a fee-for-service basis although an increasing number receive other forms of payment such as capitation, salary and blended payments.<sup>132</sup> The federal government can withhold a portion of the transfer of funds to a province should healthcare providers impose user fees or extra billing for 'medically necessary services'.<sup>130</sup> This effectively prohibits the provision of private treatment for any care that is available publicly.

In most provinces, GPs or family physicians act as gatekeepers and patients may register with a GP or family doctor of their choice. Secondary, tertiary and emergency care, as well as the majority of specialised ambulatory care and elective surgery, is provided in hospital.<sup>129</sup> In recent years, primary care and chronic disease management have become the focus of reform efforts in Canada.<sup>129-130</sup> Given the diversity of provinces and territories in relation to the organisation and funding of healthcare services, we here focus on Ontario as an example for the use of quality indicators in resource allocation. We further include a brief description of the use of quality indicators in performance measurement in the provinces of Alberta and Saskatchewan.

### 6.3.2 Local Health Integration Networks in Ontario

Ontario began regionalising healthcare organisation and financing only recently, with the implementation of 14 local health integration networks (LHINs) under the 2006 Local Health System Integration Act to enhance health system performance and improve integration of services.<sup>133</sup>

LHINs are tasked with local health system planning, service coordination and allocating resources through accountability agreements with healthcare providers such as hospitals and home care organisations.<sup>134</sup> The accountability agreements describe the expectations for agencies and organisations that plan, manage and deliver health services. They aim to accelerate quality improvement and enhance public reporting by identifying responsibilities of different parties and setting out specific performance indicators and targets. In contrast to regional health authorities in other provinces, LHINs are not service providers. Rather they determine, in partnership with providers and community members, health priorities for the areas they serve.<sup>135</sup>

With the regionalisation of planning and funding responsibilities to LHINs, the Ontario Ministry of Health and Long-Term Care has moved away from the more traditional operational role towards a stewardship role.<sup>136</sup> The role of the ministry is to set provincial priorities, develop policy and ensure accountability to provincial priorities by the LHINs. As noted above, LHINs were made responsible for planning, integrating and allocating funding for local health services, including hospitals, community-care access centres, home care, long-term care and mental health, within specific geographical areas; they develop local priorities that are aligned with provincial priorities.<sup>33</sup> The ministry has retained responsibility for some areas, such as individual practitioners and recently formed family health teams, public health, ambulances services and provincial networks and programmes. A 2008 review of the effectiveness of the transition and devolution of authority to LHINs found they had made positive progress with few problems.<sup>137</sup>

### 6.3.3 Resource allocation in Ontario's ambulatory care sector

Resource allocation for healthcare in Ontario is multi-levelled and historically sector-specific. Funding comprises federal transfers tied to population and revenue from provincial taxation. The Ministry of Health and Long-Term Care allocates funding to each of the LHINs, based on a health-based allocation model (HBAM). The HBAM is a population health-based funding model, which takes account of measures of health status and population-specific factors including age, gender, socio-economic factors and rurality, along with healthcare provider characteristics (e.g. specialisation, rural geography).<sup>138</sup> The model builds on a utilisation model to estimate annual utilisation of health services adjusted for clinical, social and demographic factors, and a cost model, determining the unit costs for each healthcare provider.

The current payment system for Ontario's hospitals is being changed under new legislation, the 2010 Excellent Care for All Act, which is expected to be implemented from April 2011. It introduces patient-based payment for hospitals, a variation of prospective payment based on diagnosis-related groups (DRGs).<sup>139</sup>

In the ambulatory care sector, the dominant payment method for doctors is based on Ontario Health Insurance Plan (OHIP) fee-for-service and per diem rates for long-term care. With the introduction of family health teams in 2004 as part of Ontario's health transformation agenda to promote patient-centred, integrated healthcare, reduce waiting times and increase access,<sup>130</sup> additional compensation models have been developed. These are aimed at incentivising family physicians to provide comprehensive primary healthcare services to their patients. Comprehensive primary healthcare services comprise "health assessments, diagnosis and treatment, primary reproductive care, primary mental health

care, primary palliative care, patient education and preventive care, and Telephone Health Advisory Service (THAS)".<sup>140</sup> Some family health teams may also provide specialist services, diagnostic services and/or health promotion programmes, chronic disease management and rehabilitation services. In line with the range of services provided, family physicians are compensated through one of three payment mechanisms. Blended capitation provides a base payment per patient for the provision of comprehensive care, plus incentives, premiums and special payments for the provision of specific primary healthcare services. The blended complement model provides a base remuneration for the provision of comprehensive care, plus incentives, premiums and special payments for the provision of specific primary healthcare services, and funding for emergency services coverage (available to identified communities with an underserved designation). Blended salary, which provides a base salary for the provision of comprehensive care, plus incentives, premiums and special payments for the provision of specific primary healthcare services (Box 6.1).<sup>140</sup>

#### **Box 6.1 Physician compensation in Family Health Teams, Ontario**

The blended capitation model includes an 'Access Bonus', defined as a payment for groups that exclusively provide services to their registered patients. Services defined as chronic disease management include a Diabetes Management Incentive and a Congestive Heart Failure Management Incentive. For example, the Diabetes Management Incentive involves an annual payment of CAN\$ 60 for physicians for coordinating, providing and documenting all required elements of care for enrolled diabetic patients. Physicians are required to maintain a flow sheet in the individual patient's record documenting the elements of diabetes management according to the Canadian Diabetes Association (CDA) 2003 Clinical Practice Guidelines. Incentive payments in the area of health promotion and disease prevention include an annual payment of CAN\$ 15.40 in addition to the regular visit fee for dialogue with enrolled patients who smoke. It further includes Service Enhancement Fees for each registered patient contacted by the physician to schedule an appointment for selected preventive care activities such as cancer screening (cervical, breast, colorectal) and immunisation (influenza for patients aged 65 years and over; childhood immunisation). In addition, the models offer sessional compensation for eligible medical specialists (geriatrics, internal medicine, paediatrics, psychiatry) while visiting a family health team. This funding stream aims to support the Ministry's strategic priority for improving the care of patients with chronic diseases.

SOURCE: Ministry of Health and Long-Term Care (2009)<sup>140</sup>

#### **6.3.4 Quality indicators in resource allocation in Ontario**

In a recent move to consolidate performance indicator activities across LHINs in Ontario, a Health System Indicator Steering Committee (HSISC) was set up with the aim of developing a coordinated approach to indicator development and monitoring.<sup>141</sup> It led to the development of the LHIN Indicator Framework to guide the identification of indicators to monitoring the performance of the healthcare system and health service providers (Figure 6.1).

Indicator development is underway for inclusion in new service provider accountability agreements for hospital care and multi-sectoral care.<sup>142</sup> The framework is intended to encourage healthcare providers to collaborate towards quality improvement. It is not yet clear whether and how financing mechanisms will be tied to the indicators.

HEALTHIER LIVING, HEALTHIER COMMUNITIES, HEALTHIER SYSTEM						
Population Health <i>Focusing on the provision of high quality health care, across the continuum of care</i>						
Cross-cutting Priorities*	Cross-cutting Dimension	Key areas of focus	Components of and Enablers to Providing quality care	Continuum of Care		
				Prevention & Promotion	Acute	Recovery & Maintenance
ER ALC CDM Mental Health & Addictions Primary Care Senior's Health	E Q U I T Y	Person Experience	Access			
			Effective			
			Safe			
		Organisational Health	Person-Centred			
			Efficient			
			Appropriately Resourced			
			Employee Experience			
		System Perspective	Governance			
			Integration			
			eHealth			
		Community Engagement				

**Figure 6.1 LHIN Indicator Framework**

NOTE: \*ER: emergency room; ALC: alternate care level; CDM: chronic disease management

SOURCE: adapted from South West LHIN<sup>143</sup>

Similar overarching frameworks are in place in Alberta (Box 6.2) and Saskatchewan (Box 6.3).

**Box 6.2 Resource allocation and the use of quality indicators in Alberta**

The responsibility for providing healthcare in Alberta province lies with the Alberta Health Services (AHS), which receives about 61% of the public funding for health. The remainder is distributed to various funding pools including physician compensation and development, drug and supplemental health benefits, human tissue and blood services and other.<sup>144</sup>

Established in 2008, the AHS amalgamated the provision of healthcare across the province.<sup>145</sup> Currently, AHS is responsible for the delivery of healthcare in hospitals, continuing care facilities, mental health services, addiction services, community health services and public health.<sup>146-148</sup> AHS does this either directly through employing medical and supporting personnel or through contracting not-for-profit and for-profit providers in all five administrative health zones in the province. AHS is also a share-owner of the 33 primary care networks across the province in which physicians (as all other physicians in the province) are paid on a fee-for-service basis.<sup>148</sup> AHS responsibilities further include overseeing the delivery of care provided in Alberta and accounting to the ministry of health of Alberta (Alberta Health and Wellness).

AHS is accountable for the budget on health and for the quality of care delivered across the province.<sup>21</sup> The quality of services, in particular those provided in the ambulatory care sector, is measured through a number of indicators reporting on processes and outcomes. The mix of indicators predominantly comprises those of patient experience and primary prevention. These include, among others, length of time to resolve patient concerns, satisfaction with particular health services (e.g. telephone health advice service) and immunisation coverage for selected population groups such as children and the elderly. Examples of indicators of clinical effectiveness (and safety) and access to healthcare are adherence to clinical guidelines and percentage of the population who have a personal family doctor.<sup>21</sup> Indicators are used exclusively as part of the accounting responsibilities of AHS and are not linked to the way funding is allocated across the province. Performance along these measures is published routinely as part of AHS's accountability reporting (see electronic appendix for an overview of AHS indicators).

### Box 6.3 Resource allocation and the use of quality indicators in Saskatchewan

The purchaser and provider of healthcare in Saskatchewan is the regional health authority (RHA), with 13 RHAs responsible for managing acute services, emergency care, long-term care, mental healthcare, rehabilitation services, respite services, palliative care, disability programmes, home care, public health services and other types of health, wellness and social centres.<sup>149</sup> RHAs also fund health facilities and providers under their control. RHAs usually contract with various private not-for-profit and a few for-profit organisations to provide specific health services such as long-term care services, radiology, laboratory and ambulance services.

While a number of medical practitioners are paid on a hierarchy-determined salary, which is negotiated through collective bargaining, most physicians in Saskatchewan are paid on a fee-for-service basis. The fees are determined by the Medical Compensation Review Committee, which includes representatives of the Saskatchewan Medical Association and the provincial ministry of health. Alternative payment arrangements are used to maintain the level of specialist physicians and specialist services, improve access to physician services in rural areas and support primary care reform. These arrangements comprise additional funding for programmes that have been established to support physicians practising in the province, using mechanisms such as bursaries, locum services, travel subsidies and continuing education to recruit and retain physicians in rural and remote communities.<sup>149</sup>

As part of regionalisation, the ministry of health (Saskatchewan Health) provides RHAs with a budget to purchase and provide care, using a population needs-based formula, which takes account of demographic, health and socio-economic characteristics of the respective population as well as historical data and specific health targets. Within this funding arrangement, RHAs are accountable to Saskatchewan Health not only for how they spend their budgets but also for the quality of care they provide. The Saskatchewan Cancer Agency, funded by Saskatchewan Health and responsible for provision of cancer control and cancer care, is also subject to the accountability standards applicable to RHAs.<sup>150</sup>

The quality of services provided by RHAs and the Saskatchewan Cancer Agency is measured through a number of indicators reporting on processes and outcomes. As the province has a history of undersupply of particular medical services, which has resulted in long waiting times, a substantial proportion of the quality indicators is targeted at capturing delays in service delivery in various parts of the system. These include for example times for service delivery in cancer and mental care by treatment stage.

The range of quality indicators is also designed to capture the performance of the healthcare system in its care for patients with chronic conditions such as asthma and diabetes. Performance is monitored through a combination of process indicators (such as specific procedure/drug use) and (intermediate) outcome indicators (such as readings of disease-specific biomarkers as well as general disease prevalence and incidence). Patient experience measures for specific conditions (e.g. breast cancer treatment) are also part of the accounting framework of RHAs so as to capture the patient-centeredness of the system through indicators such as providing sufficient information to patients about their treatment and responsiveness to patient concerns. All indicators are used exclusively as part of each RHA's accounting responsibilities and are not linked to funding. A detailed overview of indicators of the Saskatchewan performance monitoring framework is given in the electronic appendix.

### Cancer Care Ontario

Cancer Care Ontario (CCO) is an agency operating under the auspices of the Ontario Ministry of Health and Long-Term Care. Previously a direct provider of cancer services, since 2004 it provides strategic leadership for improving quality of and access to cancer

care.<sup>130</sup> This move was part of a wider initiative to improve cancer care in Ontario, also involving the development of a system of indicators of cancer care, leading to the release of the Cancer System Quality Index (CSQI) in 2005 (see below).<sup>151</sup> Table 6.3 provides an overview of the quality domains adopted by CCO to help focus its efforts in improving cancer care.

**Table 6.3 Dimensions of quality of care, Cancer Care Ontario**

Quality domain	Description	Number of indicators	Areas of measurement
Safe	Avoiding, preventing and ameliorating adverse outcomes or injuries caused by healthcare management	12	Surgery standards; emergency department visits after chemotherapy; systemic treatment safety; number of evidence-based reports
Effective	Providing services based on scientific knowledge to all who could benefit	36	Exposure to second-hand smoke; smoking cessation; reporting of cancer stage; synoptic pathology reporting; multidisciplinary cancer conferences; radiation treatment utilisation; MRT utilisation; treating lung cancer according to guidelines; number of evidence-based reports
Accessible	Making health services available in the most suitable setting at a reasonable time and distance	40	Participation in colorectal/breast /cervical cancer screening participation; cancer screening completeness; waiting times for colonoscopy/surgery/ radiation/ chemotherapy; clinical trials; number of evidence-based reports
Responsive	Providing care that is respectful of and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions	8	Patient experience; symptom assessment; end-of-life care; number of evidence-based reports
Efficient	Optimally using resources to achieve desired outcomes	3	Radiation machine efficiency; number of evidence-based reports
Equitable	Providing care and ensuring health status does not vary in quality because of personal characteristics (gender, ethnicity, geographic location, socio-economic status)	3	Off-reserve aboriginal modifiable cancer risk; number of evidence-based reports
Integrated	Coordinating health services across the various functions, activities and operating units of a system	[not available]	

SOURCE: Cancer Care Ontario (2010)<sup>152</sup>

Similar to the accountability agreements concluded between LHINs and service providers, CCO enters into comprehensive agreements with hospitals that host regional cancer centres.<sup>130</sup> The main focus of these agreements is on reducing waiting times for specialist cancer services; funding is also conditional on adherence to data reporting and quality standards from all participating hospitals.<sup>153</sup> In addition, there are financial incentives for oncologists to increase consultation time with patients as a means to improve the quality of care.<sup>130</sup> CCO, in partnership with other agencies, also allocates resources to cancer service providers across the spectrum of care through Quality and Innovation Awards, which were

established to encourage and reward quality initiatives for enhancing and improving the quality of cancer care in Ontario.<sup>152</sup>

Following a period of internal reporting, since 2009, the Cancer System Quality Index, which comprises 32 evidence-based quality measures and covers the entire pathway of cancer control from prevention to end-of-life care, is available publicly.<sup>153</sup> Public reporting is based on aggregate results while local and facility-specific data are reported internally only. Indicator development evolved from 2003, involving multiple stakeholder input.<sup>154</sup> A strategy map based on CCO's five strategic objectives was also created to ensure the selected indicators would measure progress over time against specific and widely accepted goals: to improve measurement, increase access, increase use of evidence, increase efficiency and reduce burden of cancer (improve outcomes). Indicators were selected based on a set of criteria including focus on the cancer system, relevance to the diversity of cancer care providers, link to the mission and strategic objectives of the cancer system, actionability, presence of targets and/or benchmarks, and feasibility and credibility of the measure as an indicator of quality.

Cancer quality indicators are reported annually, with regional performance reported monthly and nearly real-time at the programme level. Each regional cancer programme is led by a CCO regional vice-president (RVP) who reports regularly to CCO and their communities on the performance of the cancer system in their region and advises CCO on funding allocation for local cancer services and population need.<sup>130</sup> The performance at regional level is reviewed quarterly by CCO in joint meetings with the RVP, with funding support for poor performers decreased and shifted to higher performing centres in the region.

#### 6.3.5 Experience with performance measurement in Cancer Care Ontario

Many of the developments on quality improvement initiatives in Ontario are fairly recent and it is as yet difficult to identify successes that can be clearly attributed to any one initiative. According to the Cancer System Quality Index (CSQI), progress has been made on several indicators, such as improved survival for prostate, breast and colorectal cancer.<sup>130</sup> It has been noted that because the CSQI includes clinicians in indicator selection and reports publicly only on indicators that have been used internally for a number of years, it has encouraged change by highlighting quality gaps.<sup>153</sup> One of the main emphases of the quality of cancer care in Ontario is waiting times and it has been demonstrated that between 2005, when waiting times were made publicly available for the first time, and 2008, the 90th percentile for surgical waiting times fell by 36% from 81 days to 52 days.<sup>153</sup> In addition, regional variability in waiting times has declined also, from a gap of over 2 months between the longest and shortest waits (at 112 and 47 days, respectively) to regional variability of between 87 and 38 days at the end of 2008.

## 6.4 England

### 6.4.1 Healthcare system context\*

Healthcare in England is largely organised and delivered through the National Health Service (NHS). Health services provided through the NHS are funded through general taxation, including a small national insurance contribution. Overall this accounts for about 87% of total health expenditure.<sup>155</sup> The NHS covers all residents, and health services are free at the point of use, with few exceptions such as prescription drugs, dental and optical care for which there are co-payments. Approximately 12% of the population is covered by supplementary private health insurance, mainly providing access to elective care in the private sector and some dental care; private insurance accounts for 1% of total healthcare expenditure, with out-of-pocket payments accounting for another 12%.<sup>155</sup>

The NHS is overseen by the Department of Health (DH), which is responsible for developing the overall policy framework. Strategic health authorities (SHAs, created in 2002) provide regional strategic leadership. Primary care trusts (PCTs, also established in 2002) are responsible for organising the delivery of care for geographically defined populations through a mix of direct service provision and commissioning of primary, secondary and community care. Over 80% of the NHS budget is currently allocated to PCTs to purchase services from mainly publicly owned hospitals and self-employed general practitioners, and more recently also from the private sector.

Since 2005, part of the healthcare commissioning function has been devolved in part to the level of general practices under the Practice-Based Commissioning (PBC) scheme, although PCTs typically hold the resultant contracts and retain ultimate financial responsibility. Under current government plans, from 2012/13, GP practice consortia will take on full responsibility for these budgets to commission the majority of NHS services, and a newly created independent NHS Commissioning Board will oversee the new structures, with PCTs and SHAs set to be abolished.<sup>156</sup>

During the past decade, newly created bodies at arm's length from the Department of Health, such as the National Institute for Health and Clinical Excellence (NICE), Monitor (the regulator of NHS foundation trusts) and the Care Quality Commission, have assumed a range of key regulatory and quality assurance functions, including monitoring provider performance, issuing national guidelines and developing national standards.

Publicly financed care is provided mainly by general practitioners who are the first contact point for primary care and by salaried doctors and nurses in public hospitals (NHS trusts and foundation trusts) providing secondary and tertiary care. General practitioners act as gatekeepers to secondary and specialist care services. Some publicly financed care is also provided by private and voluntary providers. Services provided by NHS trusts and NHS foundation trusts are increasingly paid on the basis of activity, known as 'payment by

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\* Adapted from Cacace et al. (2010). The description of the mechanisms in the English healthcare system largely reflects the system in place under the previous Labour government. However, where appropriate and feasible, we refer to changes proposed and/or implemented by the new coalition government, in place from May 2010.

results' (PbR). This prospective payment system is similar to those based on diagnosis-related groups (DRGs); in 2006/07, PbR accounted for approximately 35% of PCT allocations and about 60% of acute trust income.<sup>157</sup> Since 2009, the Commissioning for Quality and Innovation (CQUIN) payment framework requires contracts concluded between commissioners (currently PCTs) and providers of acute care, mental health, ambulance and community services to incorporate clauses that will make a proportion of income conditional on the quality and innovation seen in their services (see below).<sup>158</sup>

#### 6.4.2 Resource allocation in the ambulatory care sector

In the English healthcare system the Department of Health allocates over 80% of the NHS budget to currently 152 primary care trusts, using a weighted capitation formula that accounts for population size, indicators of healthcare need as defined by age and health status, and a so-called market forces factor (MFF) to account for differences in the costs of delivering services across PCTs so as to enable commissioning of similar levels of health services for populations with similar need.<sup>159</sup> From these allocations, PCTs fund primary care services, hospital and community health services (HCHS), and acute hospital services, including mental health, maternity, HIV/AIDS and other community and public health services. Specialists in the UK generally work entirely within hospitals; ambulatory care by specialists is generally provided within hospitals. Allocations are made in totals, so PCTs have to determine how best to use the resources allocated to them to meet the needs of their local populations and priorities, within national standards and the requirements set out in the Department of Health's annual operating framework for the NHS (see Section 6.4.3).<sup>160</sup> There are separate need formulas for HCHS, prescribing, and primary medical services; HCHS account for 76% of the overall weighted capitation formula while prescribing accounts for 12% and primary medical services for 11%.<sup>161</sup> The primary medical services component has adjustments for age- and sex-related need (based on utilisation), additional need (based on indicators of limiting long-term illness and standardised mortality ratio for those aged under 65 years), health inequalities and variations in the unavoidable cost of providing healthcare (market forces factor).

Most primary care healthcare services in England are provided by primary care teams, including general practitioners, nurses and other health professionals, usually in community-based GP practices or health centres. Most GPs operate privately under a national contract, with their income paid by primary care trusts (PCTs). From the gross income of the practice, the GPs pay their staff and other expenses, with their take home pay dependent on the profit of the practice. The basic payment is through the General Medical Services (GMS) contract, which is negotiated nationally by the Department of Health with the NHS Employers and General Practitioners Committee of the British Medical Association; they form the basis for contracts between general practices and PCTs.<sup>162</sup> The largest components of practice income are weighted capitation derived from the weighted capitation formula outlined above and quality payments (see below). In addition, there are payments for particular services ('enhanced services') and some payments for seniority. The weighted capitation formula was changed in 2004 in a way that would have significantly disadvantaged some practices; as a result practices have a choice of which formula is used as the basis for their payments (the 'Minimum Practice Income Guarantee').

Under the 2004 GMS contract all GP practices are required to provide certain essential services, though practices can opt out of providing ‘additional services’ including vaccination, contraceptive and child health surveillance services. Capitation payment for practices that choose to opt out are reduced accordingly.

In 2006/07, the GMS contract was amended to reward general practices for providing ‘enhanced services’ and so support national priorities for patient services.<sup>162</sup> Enhanced services are of two types: ‘local enhanced services’ (LES) and ‘directed enhanced services’ (DES). DES must be provided in collaboration with the PCT and, in 2010, related to extended opening hours, alcohol-related risk reduction, ethnicity and first language recording, health checks for people with learning disabilities, and diagnosis and prevention of osteoporosis.<sup>163</sup> LES are locally developed services designed to meet local health needs; ‘national enhanced services’ (NES) are defined as services commissioned to meet local need to national specifications and benchmark pricing. Examples of these include enhanced care of the homeless, more specialised services for multiple sclerosis and specialised care of patients with depression.<sup>164</sup>

In addition, there are voluntary personal medical services (PMS) contracts, introduced in 1998, which are locally agreed contracts that permit PCTs to contract specific services to better meet community needs (e.g. those for vulnerable populations such as refugees and asylum seekers). Alternative provider medical services (APMS) contracts provide additional opportunities for PCTs to contract for primary medical services to secure provision of essential services, especially in areas where it is difficult to provide high quality medical care.

#### 6.4.3 Quality indicators in resource allocation

As noted above, PCTs hold the majority of NHS funds, using them to meet the needs of their local populations and priorities. They have to do so within national standards and the requirements set out in the operating framework (Box 6.4). The most recent operating framework of 2010/11 identified five national priorities for NHS organisations<sup>165</sup>:

- improving cleanliness and reducing healthcare-associated infections
- improving access to ambulatory specialist care (out-patient clinics) through achievement of the 18-week referral to treatment pledge, and improving access to GP services (including at evenings and weekends)
- improving population health and reducing health inequalities
- improving patient experience, and staff satisfaction and engagement
- improving emergency preparedness.

Although the allocation of resources is not directly linked to meeting these national priorities, PCTs are required to develop operational plans setting out how they will deliver on the priorities, which are signed off by the strategic health authority.

**Box 6.4 NHS operating framework 2010/11**

Delivery of the national priorities set out in the 2010/11 NHS operating framework will be assessed against achievement of so-called 'existing commitments' and 'Vital Signs tiers 1 and 2' indicators. Indicators for the national priority 'Improving health and reducing health inequalities' are:

- implementation of the stroke strategy
- proportion of women receiving cervical cancer screening test results within two weeks
- all-age, all-cause mortality rate per 100,000 population
- <75 CVD mortality rate
- <75 cancer mortality rate
- suicide and injury of undetermined intent mortality rate
- smoking prevalence among people aged 16 or over, and aged 16 or over in routine and manual groups (quit rates locally 2009)
- percentage of women who have seen a midwife or a maternity healthcare professional, for assessment of health and social care needs, risks and choices, by 12 completed weeks of pregnancy
- under-18 conception rate per 1,000 females aged 15–17
- obesity among primary school-age children
- proportion of children who complete immunisation by recommended ages
- percentage of infants breastfed at 6–8 weeks
- effectiveness of Children and Adult Mental Health Service (CAMHS) (percentage of PCTs and local authorities that are providing a comprehensive CAMHS)
- number of drug users recorded as being in effective treatment
- prevalence of Chlamydia.

Source: Department of Health (2009)<sup>165</sup>

PCTs are further assessed under the World Class Commissioning (WCC) programme, which was introduced in 2007 in a move to improve the effectiveness of commissioning.<sup>166</sup> The programme includes an annual process that reviews PCTs' progress towards achieving better health outcomes for their populations and provides a common basis for agreeing further development ('WCC assurance'). Again, this system is not directly related to resource allocation, but where PCTs perform poorly on the WCC assurance programme, the relevant strategic health authority is expected to "work closely with these PCTs to support their accelerated improvement".<sup>165</sup> A detailed overview of indicators used within the WCC is given in the electronic appendix.

**The Quality and Outcomes Framework**

The 2004 national GP contract, which applies to across the UK, introduced a new voluntary payment programme that linked up to 25% of practice income to performance. 'Achievement points' are awarded for adhering to procedural and treatment guidelines and meeting intermediate outcome targets for over 130 quality indicators. This pay for performance scheme, better known as the Quality and Outcomes Framework (QOF), aimed not only to make the GP profession more attractive, but to reduce the wide variation in payments to practices, to fairly link reward to workload, and to help reduce health inequalities.

There have been several updates to the QOF since the original 2004 contract. The 2009/10 QOF comprises four domains: clinical, organisational, patient experience and additional services.<sup>24</sup> Practices can score a maximum of 1,000 points. For 2009/10,

practices were paid on average £126.77 for each point they achieved.<sup>167</sup> The clinical domain currently comprises 80 indicators across 19 clinical areas: coronary heart disease, heart failure, stroke and transient ischaemic attacks, hypertension, diabetes mellitus, chronic obstructive pulmonary disease, epilepsy, hypothyroidism, cancer, palliative care, mental health, asthma, dementia, depression, chronic kidney disease, atrial fibrillation, obesity, learning disabilities and smoking. The organisational domain comprises 43 indicators across five organisational areas, including records and information, information for patients, education and training, practice management and medicines management. Patient experience is assessed through four indicators that relate to length of consultations, and experience of access to GP services (derived from the national GP patient survey<sup>168</sup>). Additional services comprise eight indicators across four service areas, which include cervical screening, child health surveillance, maternity services and contraceptive services. An overview of indicators used within QOF is provided in the electronic appendix.

Data for the clinical quality indicators are collected automatically from GP electronic medical records through the Quality Management Analysis System (QMAS), a national IT system developed by NHS Connecting for Health. The NHS Information Centre for Health and Social Care (NHS IC) has access to extracts from the QMAS to support the publication of QOF information. NHS IC publishes the information for the public, regulators, health and social care professionals, and policymakers. For example, in 2009/10, 8,305 GP practices in England were included in the published results, covering almost 100% of registered patients in England.<sup>169</sup>

Quality measures are also being incorporated into resource allocation for specialist care. Box 6.5 provides a summary of the Commissioning for Quality and Innovation (CQUIN) payment framework, introduced in 2009, which requires commissioners of secondary care to incorporate elements to improve care quality in contractual agreements.

**Box 6.5 Purchasing for quality in secondary care: the CQUIN framework**

The Commissioning for Quality and Innovation (CQUIN) is designed to make a proportion of providers' income conditional on the quality and innovation of services provided. It is mandatory for PCTs using national contracts with providers of acute, ambulance, community, mental health and learning disability services. These cover hospital care and ambulatory specialist care (defined as outpatient care, which is provided in hospital) as well as community services but not primary care. CQUIN schemes are required to include goals in the three domains of quality: safety, effectiveness and patient experience, and innovation. Indicators are chosen and agreed between the provider and the PCT and are intended to reflect local needs and objectives. Data collection methods and timings are also subject to the discretion of the individual parties. Examples of contracts and detailed overviews of quality indicators in use in CQUIN schemes, are available from the NHS Institute for Innovation and Improvement.<sup>170</sup> As of 2010/11, providers can earn up to 1.5% of any contract value through CQUIN achievement. Additional policy aims of CQUIN schemes are to support inter-organisational learning and transparency between purchasers and providers.

**6.4.4 Experience of the mechanisms in place so far**

Most interest internationally has focused on the QOF, which accounts for 25% of general practitioners' income and is the most ambitious pay for performance scheme in the world. The scheme led to rapid and universal adoption of electronic records by GPs since payments were dependent on data extracted from electronic records. They employed more staff, especially nurses and administrative staff, and proactive care for major chronic

diseases such as diabetes and asthma were increasingly provided by nurses working in disease focused clinics within their GP practices. The scheme led to an increase in the rate of quality improvement of clinical care for major chronic diseases, but against a background of care that was already improving rapidly. Within two years of the new incentives, GPs had earned most of the quality payments available, and the rate of improvement reached a plateau.<sup>3</sup> This may be partly because there was no further incentive for improvement, and partly because quality in some areas had reached such high levels that there was no room for further improvement. There has been criticism in the UK that the indicators were set at too 'easy' a level, but the scheme has also had an effect in reducing inequalities in the delivery of primary care.<sup>171</sup>

There is little evidence that care for non-incentivised conditions has suffered as a result of the quality incentives, though there have been some unexpected and adverse consequences of the scheme. The most notable of these is that an incentive to reduce waiting times for appointments with general practitioners had the perverse effect of introducing over-rigid booking systems, which meant that many patients found it more difficult to make appointments.<sup>172</sup>

It should be noted that the QOF is a pay for reporting scheme as well as a pay for performance one. All data are publicly reported, and this acts as an additional incentive to doctors who do not like to be seen as less good than their peers. The relative impact of payments and public reporting is now known however.

The impact of other financial incentives for quality, in particular the CQUIN programme for hospital care (including ambulatory specialist care), is less well studied.

## 6.5 New Zealand

### 6.5.1 Healthcare system context

Healthcare in New Zealand is financed largely through public sources (78%), mainly general taxation (85%) and social security contributions (15%). The remaining 22% is funded from private sources including private health insurance and out-of-pocket payments.<sup>173</sup> The New Zealand Ministry of Health distributes funding for most publicly funded services to 20 district health boards (DHBs). Care necessitated because of accidents or injury is financed through the Accident Compensation Corporation.<sup>174</sup>

DHBs consist of members who are elected by popular vote or appointed by the Minister of Health; they are accountable to the local community and the Minister. DHBs are responsible for managing public resources and purchasing publicly funded healthcare and long-term care for their population from private providers such as private surgical hospitals (mainly for elective surgery and laboratory services), disability support services and community care.<sup>160</sup> DHBs also own and operate public acute care and mental health hospitals, which provide most secondary and tertiary care and are paid through prospective global budgets with casemix funding applying to inter-district service flows.<sup>173</sup> Healthcare provision is both public and private. Specialists in public hospitals are paid a salary. GPs are usually independent, self-employed providers. GPs act as gatekeepers to secondary care; residents are free to choose any GP.

DHBs purchase a significant proportion of primary care services through contracts with primary health organisations (PHOs), which were introduced following the 2001 Primary Health Care Strategy. There are currently 82 PHOs, covering almost the entire population.<sup>175</sup> PHOs organise and manage publicly funded primary care, and subsidise low-cost access to general practitioner services, covering over 95% of the population.<sup>176</sup>

PHO membership is voluntary for patients and providers. However, the government has created incentives for primary care and community health professionals to join PHOs by providing additional funding (set aside within the Primary Health Care Strategy) for activities targeted at reducing inequalities in healthcare provision and utilisation.<sup>160</sup>

### 6.5.2 Resource allocation in the ambulatory care sector

There are two levels of funding allocation in ambulatory care in New Zealand: regional (DHBs) and practice level (PHOs).

The level of funding for DHBs is determined using a population formula based on relative needs of DHB's populations and the cost of providing health services.<sup>177</sup> DHBs assess needs on the basis of population size and socio-demographic characteristics, its unmet needs, national average costs of health and disability support services, and geography.<sup>31</sup> Funding is calculated on the basis of (i) the share of the projected population, weighted according to the national average cost of the health services used by different population; (ii) a 'policy-based weight' for unmet need to account for the different challenges faced by DHBs with regard to reducing disparities between population groups; and (iii) an adjustment for rurality and for overseas visitors to account for unavoidable differences in the cost of providing certain health and disability support services.<sup>177</sup>

DHB funding pays for all services provided to DHB populations. Through the provisions of the ‘inter-district flows’ arrangement it also covers services provided to a DHB’s population by another DHB but excludes compensating for ‘bad debts’ or new funding for primary healthcare organisations.<sup>177</sup>

As noted earlier, the 2001 New Zealand Primary Care Strategy introduced PHOs, which bring together various health professionals, including physicians, nurses and community health practitioners, to provide comprehensive care to their enrolled population. PHOs are not-for-profit organisations; they provide services either directly or through contracting other health services providers. While participation of primary care providers in PHOs is voluntary, they have been incentivised to join through freezes of fee-for-service subsidies and more generous and continuously increasing PHO funding.<sup>178</sup>

DHBs negotiate annual agreements with non-statutory PHOs. Despite its ability to directly or indirectly influence pay, the Ministry of Health in New Zealand does not have a legal role in the bargaining process.<sup>179</sup> Under these agreements, PHOs receive a fixed amount of funding for a range of health services for their enrolled populations, distinguishing four funding streams: First Contact, Health Promotion, Services to Improve Access and Co-payment for Pharmaceuticals (Table 6.4).<sup>180</sup> The level of funding is based on the size of a population’s PHO’s service and the characteristics of these populations, including age, gender, ethnicity, deprivation quintile and whether the individual holds a Community Services (CS) card or a High Use Health (HUH) card; allocations may vary across funding streams.

**Table 6.4 PHO funding streams, New Zealand**

Stream type	Age	Gender	Ethnicity	Deprivation quintile	HUH card	CS card	Access/ interim practices
First Contact	Y	Y	N	N	Y	Y	Y
Health Promotion	N	N	Y	Y	N	N	N
Services to Improve Access	Y	Y	Y	Y	N	N	N
Pharmaceutical Co-payments	Y	N	N	N	Y	Y	N

SOURCE: Ministry of Health (2010)<sup>181</sup>

Unlike other streams, First Contact funding provides differential payments for PHOs depending on the need of the population they serve. With the introduction of PHOs these were initially distinguished into access and interim. Access PHOs served higher need populations with more than 50% of enrolled populations being Māori, Pacific Islander or from lower socio-economic areas. All other PHOs were designated as interim. Access PHOs received higher capitation rates per registered resident than interim PHOs. From 2003, funding for interim PHOs was gradually increased, in line with the age distribution of their corresponding population.<sup>178 181</sup>

In addition to the funding streams shown in Table 6.4, PHOs can qualify for Care Plus, a funding stream targeted at individuals with chronic conditions such as diabetes or heart disease, with acute medical or mental health needs, or a terminal illness.<sup>182</sup> Care Plus covers

about 5% of the New Zealand population, with the level of funding dependent on the proportion of eligible Care Plus patients actually enrolled in the programme. Funding for Care Plus also increases with an increasing number of Care Plus patients.

Further sources of funding include payments for rural practice and mental health services.<sup>178 182</sup> In 2006, the government also initiated the Very Low Cost of Access Programme to support PHOs to maintain very low fees (co-payments). As PHO practices that charge very low fees typically serve high need communities, they forgo revenues from patient fees. The programme therefore aims to reduce health inequalities through subsidising low cost access.<sup>183</sup>

A PHO Performance Management Programme was introduced in 2006, designed by the primary care sector, DHBs and the Ministry of Health in New Zealand to improve the health of enrolled populations and reduce inequalities in health outcomes. PHOs participating in this programme receive additional funding for achieving a range of national indicators (see below).

In contrast to DHBs who report to the Minister of Health and the public, PHOs are also accountable to their DHBs. PHOs publish annual reports and annual financial statements. Annual reports inform on the performance and achievements of the PHO against the goals of the Primary Health Care Strategy. In addition, the reports serve to inform DHBs on public expenditure and its appropriateness and effectiveness.<sup>184</sup>

### 6.5.3 Quality indicators in resource allocation

As part of funding allocation and accountability, DHBs and PHOs have to monitor and report on a range of quality indicators designed to capture performance and provide an evidence base for service improvement.

DHB's performance is measured against four dimensions: outcomes, services, ownership and stewardship, and consultation and collaboration (Table 6.5). The 'outcomes' dimension aims to capture performance directed at improving, promoting and protecting the health of people and communities whereas the 'services' dimension targets the promotion of effective care and support. Further, 'ownership and stewardship' evaluates performance along four domains, which contribute to developing policy objectives, capacity and integrity as well as ensuring appropriate management of resources and risk. Finally, 'consultation and collaboration' addresses performance related to engagement with other parties in healthcare and communities for the purpose of achieving target health outcomes and improved service provision.<sup>185</sup>

**Table 6.5 Dimensions of DHB performance evaluation, New Zealand**

<b><i>Outcomes – managing towards improving, promoting and protecting the health of people and communities</i></b>	<b><i>Services – promoting effective care and support</i></b>
<p>Achieve improvements in health and disability outcomes, in accordance with the Government’s priorities</p> <p>Reduce health inequalities</p> <p>Demonstrate progress against targets</p> <p>Demonstrate progress with local priorities</p>	<p>Arrange health and disability services</p> <p>Balance the need for nationwide consistency and to contribute to nationwide goals with the need to be responsive to local community needs, including the needs of Māori communities</p> <p>Ensure that the choice of service is based on the best way to improve health outcomes and meet people’s care and support needs, within available resources</p> <p>Deliver health and disability services</p>
<b><i>Ownership/stewardship</i></b>	<b><i>Consultation and collaboration – for the purposes of achieving health outcomes and planning services</i></b>
<p>Strategy: contribute to government policy objectives</p> <p>Capability and sustainability:</p> <ul style="list-style-type: none"> <li>• Develop organisational capability, including workforce and information system development</li> <li>• Support the development of local service providers, including Māori providers</li> </ul> <p>Integrity:</p> <ul style="list-style-type: none"> <li>• Comply with the legislative mandate and obligations</li> <li>• Operate fairly, ethically and responsibly</li> </ul> <p>Performance:</p> <ul style="list-style-type: none"> <li>• Ensure the DHB’s finances, capital assets and other resources are well managed</li> <li>• Ensure risk is well managed</li> </ul>	<p>Engage with:</p> <ul style="list-style-type: none"> <li>• The community, including Māori</li> <li>• Other DHBs and the Ministry of Health</li> <li>• Other sectors</li> </ul>

SOURCE: New Zealand Ministry of Health (2007)<sup>185</sup>

Performance outcome measures are translated into 15 specific indicators DHBs report on quarterly to the Ministry of Health (Table 6.6), which in turn monitors performance and identifies areas of deficiency and need for improvement.

**Table 6.6 DHB performance outcome indicators**

- 
- Local Iwi Māori engaged in DHB decisions & strategies
  - Improving mainstream effectiveness
  - DHBs set targets to increase funding for Māori Health and disability initiatives
  - Pacific provider service contracts
  - Improving the health status of people with severe mental illness
  - Alcohol and other drug service waiting times
  - Chemotherapy treatment waiting times
  - Family violence prevention
  - Utilisation of DHB funded dental services by adolescents from year nine up to and including age 17
  - Ambulatory sensitive (avoidable) hospital admissions
  - Improving mental health services
  - Improving breastfeeding rates
  - Improving the quality of data provided to National Collections Systems
  - Service coverage
  - Low or reduced cost access to first level primary care services
- 

SOURCE: New Zealand Ministry of Health (2010)<sup>186</sup>

As noted above, under the PHO Performance Management Programme, participating PHOs are rewarded on the basis of their performance against a set of national indicators. These currently include indicators for chronic care (n=6), immunisation (n=2) and financial indicators (n=2) (Table 6.7).

Chronic care indicators predominantly address the processes of care for cancer, (ischaemic) heart disease and diabetes. Prevention indicators focus on process and outcome measures of flu and early childhood vaccination whereas financial indicators report on GP referred laboratory and pharmaceutical expenditure. Each indicator is monitored for the total population and high needs groups and depending on this classification receives a different weight in total payments received by PHOs.<sup>26</sup> PHOs that meet all their targets receive the maximum payment of NZ\$ 6.16 (inclusive of Goods and Services Tax) per year per enrolled patient.<sup>187</sup>

In addition to ‘funded indicators’ as shown in Table 6.7, ‘information only’ indicators are used to monitor PHO performance. These include indicators on domains such as smoking cessation services, service utilisation, pharmaceutical use and cancer screening. A detailed overview of PHO performance indicators is provided in the electronic appendix.<sup>26 188</sup>

**Table 6.7 Funded indicators of PHO performance, New Zealand**

	Reference population	Annual %
<b>Chronic conditions indicators</b>		
Cervical cancer screening coverage	Total population	3.00
	High needs	6.00
Breast cancer screening coverage	High needs	6.00
Ischaemic CVD detection	Total population	3.00
	High needs	6.00
CVD risk assessment	Total population	8.00
	High needs	12.00
Diabetes detection	Total population	3.00
	High needs	6.00
Diabetes follow up after detection	Total population	3.00
	High needs	6.00
<b>Prevention of infectious diseases indicators</b>		
Flu vaccine coverage for those aged 65+	Total population	3.00
	High needs	6.00
Age appropriate vaccinations for 2 year olds	Total population	3.00
	High needs	6.00
<b>Financial indicators</b>		
GP referred laboratory expenditure	Total population	10.00
GP referred pharmaceutical expenditure	Total population	10.00
<b>TOTAL score</b>		<b>100.00</b>

SOURCE: District Health Boards New Zealand (2010)<sup>26</sup>

#### 6.5.4 Experience of the mechanisms in place so far

A recent evaluation of the 2006 PHO Performance Management Programme concluded that PHOs perceived ‘programme fit’ within their organisational structure and goals as generally good, while highlighting specific programme limitations.<sup>189</sup> For example, it was noted that programme indicators were not always closely tied to ‘best practice’; this was particularly the case for other elements of primary care perceived as more important or effective (“there are ‘bigger killers’ than cervical cancer”). One other point of concern was that while there are absolute, relative and cyclical measures of performance, its focus on relative measures only implies that the same level of performance (e.g. 70% screened) may be judged as either successful or a failure depending on where the target has been set.<sup>189</sup> Finally, while performance measures can focus attention, there was a perception that they may as well divert attention of providers from other equally important components of the care process.<sup>188-189</sup> There is therefore a need to better align and reinforce the programme to balance potential competing government priorities at practice level and minimise contradictory policy priorities.<sup>189</sup> The conflict between quality chronic care management and ‘watching’ some types of spending is one example provided by PHOs.

Some additional limitations revealed by the evaluation were the lack of transparency of the allocation of funds, which was identified as a possible disincentive to providers. Also, the programme was not always known among those who impact on performance. Timely data

provision was identified as a key challenge of the programme, effectively delaying timely use to inform improvement.<sup>188</sup>

To address this key concern, in 2009, the frequency of data provision on cervical screening and influenza vaccinations was increased from quarterly to monthly, which was also complemented by improving the data reporting infrastructure.<sup>188</sup> This strategy has so far proven successful and is currently being expanded to other indicators.

The range of indicators used, and specifically those focusing on the clinical aspects of performance, has been changing over time. Since commencement of the programme in 2006, four new indicators (ischaemic CVD detection, CVD risk assessment, diabetes detection and diabetes follow-up) were introduced in 2008 (Table 6.7). Two additional indicators, smoking status ever recorded and percentage of eligible population who are current smokers, are currently being tested in the field.<sup>188</sup>

An analysis of the implementation of the Primary Health Care Strategy found that it had improved health outcomes among the New Zealand population, including improving immunisation rates and reducing inequalities by ethnicity.<sup>175</sup> A key success has been the reduction in access fees, although sustaining these achievements remains a challenge. Similar to other work, the study also highlighted the need for good information and clarity in the level of the system where performance ought to be measured and rewarded.



## REFERENCES

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## Reference list

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1. Bundesministerium für Gesundheit. Daten des Gesundheitswesens 2009. [Online] Available at [http://www.bmg.bund.de/cdn\\_160/nn\\_1168278/SharedDocs/Downloads/DE/Statistiken/Statistisches\\_20Taschenbuch/DatendesGesundheitswesens2009,templateId=raw,property=publicationFile.pdf/DatendesGesundheitswesens2009.pdf](http://www.bmg.bund.de/cdn_160/nn_1168278/SharedDocs/Downloads/DE/Statistiken/Statistisches_20Taschenbuch/DatendesGesundheitswesens2009,templateId=raw,property=publicationFile.pdf/DatendesGesundheitswesens2009.pdf) (Accessed on 30 June 2010).
2. Gesetzentwurf der Fraktionen der CDU/CSU und FDP. Entwurf eines Gesetzes zur nachhaltigen und sozial ausgewogenen Finanzierung der Gesetzlichen Krankenversicherung (GKV Finanzierungsgesetz – GKV-FinG), 28.09.2010. Drucksache 17/3040. Berlin: Deutscher Bundestag, 2010.
3. Campbell S, Reeves D, Kontopantelis E, Sibbald B, Roland M. Effects of pay-for-performance on the quality of primary care in England. *N Engl J Med* 2009;361:368-78.
4. Giuffrida A, Gravelle H, Roland M. Measuring quality of care with routine data: avoiding confusion between performance indicators and health outcomes. *BMJ* 1999;319:94-98.
5. Mattke S, Epstein A, Leatherman S. The OECD Health Care Quality Indicators Project: history and background. *Int J Qual Health Care* 2006;18:1-4.
6. Mattke S, Kelley E, Scherer P, Hurst J, Gil Lapetra M, HCQI Expert Group Members. *Health Care Quality Indicators Project: initial indicators report*. Paris: OECD, 2006.
7. McGlynn E. Selecting common measures of quality and system performance. *Medical Care* 2003;41(Suppl.):I-39-I-47.
8. Nolte E. *International benchmarking of healthcare quality*. Santa Monica: RAND Corporation, 2010.
9. Damberg C, Raube K, Teleki S, Dela Cruz E. Taking stock of pay-for-performance: a candid assessment from the front lines. *Health Affairs* 2009;28:517-25.
10. Hussey P, Sorbero M, Mehrotra A, Liu H, Damberg C. Episode-based performance measurement and payment: making it a reality. *Health Affairs* 2009;28:1406-17.
11. Mehrotra A, Sorbero M, Damberg C. Using the lessons of behavioral economics to design more effective pay-for-performance programs. *Am J Manag Care* 2010;16:497-503.
12. Fung C, Lim Y, Mattke S, Damberg C, Shekelle P. Systematic review: the evidence that releasing performance data to the public improves quality of care. *Ann Intern Med* 2008;148:111-23.

13. Cacace M, Ettelt S, Brereton L, Pedersen J, Nolte E. How health systems make available information on service providers: Experience in seven countries. Cambridge/London: RAND Europe/London School of Hygiene & Tropical Medicine, 2010.
14. Sorbero M, Damberg C, Shaw R, Teleki S, Lovejoy S, Decristofaro A, et al. Assessment of pay-for-performance options for Medicare physician services: final report. Working Paper. Santa Monica: RAND Corporation, 2006.
15. Stecher BC, F, Damberg C, Hamilton LM, KJ, Nelson C, Sorensen P, Wachs M, et al. *Toward a culture of consequences. Performance-based accountability systems for public services*. Santa Monica: RAND Corporation, 2010.
16. Legido-Quigley H, McKee M, Nolte E, Glinos I. *Assuring the quality of health care in the European Union*. Copenhagen: World Health Organization on behalf of the European Observatory on Health Systems and Policies, 2008.
17. Grol R, Dautzenberg M, Brinkmann H. *Quality management in primary care*. Gütersloh: Verlag Bertelsmann Stiftung, 2005.
18. Department of Health and Ageing. Divisions of General Practice Program. National Performance Indicators 2009 -10. [Online] Available at [http://www.phcris.org.au/divisions/reporting/documents/techdetails/NPI\\_Technical\\_Details\\_10\\_May\\_2010.pdf](http://www.phcris.org.au/divisions/reporting/documents/techdetails/NPI_Technical_Details_10_May_2010.pdf) (Accessed on 8 November 2010).
19. Medicare Australia. Practice Incentives Program (PIP) payments and calculations. [Online] Available at <http://www.medicareaustralia.gov.au/provider/incentives/pip/payment-formula/index.jsp> (Accessed on 27 November 2010).
20. Alberta Health Services (AHS). Alberta Health Services Board. Quality and Patient Safety Dashboard. Background Paper January 2010 Version 1.3. [Online] Available at <http://www.albertahealthservices.ca/files/pr-quality-and-patient-safety-dashboard-background-paper.pdf> (Accessed on 8 November 2010).
21. Alberta Health Services (AHS). Performance Report, June 2010. [Online] Available at <http://www.albertahealthservices.ca/Publications/ahs-pub-pr-2010-06-performance-report.pdf> (Accessed on 24 November 2010).
22. Health Quality Council. HQC reports on quality/performance. [Online] Available at <http://www.hqc.sk.ca/portal.jsp?I2s6N+qXEGO0FgKBecq12DBIzBf0QfLQkUwK4QBZaJuGeJ+4XDZ4F1VvI5thiwzu> (Accessed on 20 November 2010).
23. Saskatchewan Ministry of Health. Performance Management Accountability Indicators 2007-08. 2008; [Online] Available at <http://www.health.gov.sk.ca/performance-management-accountability> (Accessed on 24 November 2010).
24. British Medical Association, NHS Employers. *Quality and Outcomes Framework guidance for GMS contract 2009/10*. London: NHS Employers and BMA, 2009.
25. Department of Health. *World class commissioning assurance handbook Year 2*. London: Department of Health, 2009.
26. District Health Boards New Zealand. PHO Performance Programme. Indicator definitions as at 1 July 2010. [Online] Available at <http://www.dhbnz.org.nz/Site/SIG/pho/Operational-Documents.aspx> (Accessed on 26 November 2010).
27. Swedish Association of Local Authorities and Swedish National Board of Health and Welfare. *Quality and Efficiency in Swedish Health Care – Regional Comparisons*

2008. Stockholm: Swedish Association of Local Authorities and Swedish National Board of Health and Welfare, 2008.
28. National Committee on Quality Assurance (NCQA). What is HEDIS? [Online] Available at <http://www.ncqa.org/tabid/187/Default.aspx> (Accessed on 8 November 2010).
  29. National Committee on Quality Assurance (NCQA). Choosing quality health care. [Online] Available at <http://www.ncqa.org/tabid/60/Default.aspx> (Accessed on 8 November 2010).
  30. Institute for Clinical System Improvement. [Online] Available at <http://www.icsi.org/> (Accessed on 26 November 2010).
  31. Staines A. *Towards the development of a resource allocation model for primary, continuing and community care in the health services*. Dublin: Dublin City University, 2010.
  32. Brick A, Nolan A, O'Reilly J, Smith S. *Resource allocation, financing and sustainability in health care. Evidence for the Expert Group on Resource Allocation and Financing in the Health Sector*. Dublin: The Economic and Social Research Institute, 2010.
  33. Fazekas M, Ettelt S, Newbould J, Nolte E. *Framework for assessing, improving and enhancing healthcare planning*. Santa Monica: RAND Corporation, 2010.
  34. Nolte E, Knai C, McKee M, editors. *Managing chronic conditions: Experience in eight countries*. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory of Health Systems and Policies, 2008.
  35. Donabedian A. *The definition of quality and approaches to its management*. Ann Arbor: Health Administration Press, 1980.
  36. Donabedian A. The quality of care: how can it be assessed? *JAMA* 1988;260:1743-8.
  37. Lohr K. *Medicare: A strategy for quality assurance*. Washington, D.C.: National Academy Press, 1990.
  38. Department of Health. *A first-class service – quality in the new NHS*. London: Department of Health, 1997.
  39. Campbell S, Roland M, Buetow S. Defining quality of care. *Soc Sci Med* 2000;51:1611-25.
  40. Maxwell R. Dimensions of quality revisited: from thought to action. *Quality in Health Care* 1992;1:171-77.
  41. Council of Europe. Recommendation No. R (97) 17 of the Committee of Ministers to member states on the development and implementation of quality improvement systems (QIS) in health care. Strasbourg Cedex: Council of Europe, 1997.
  42. Institute of Medicine. *Crossing the quality chasm: A new health system for the 21st century*. Washington, DC: National Academy Press, 2001.
  43. Kelley E, Hurst J. Health Care Quality Indicators project. Conceptual framework paper. *OECD Health Working Papers 23*. Paris: OECD, 2006.
  44. Department of Health. *The NHS Performance Assessment Framework*. London: Department of Health, 1999.
  45. Canadian Institute for Health Information. *Health Indicators*. Ottawa: CIHI, 2005.
  46. National Health Performance Committee. *National report on health sector performance indicators 2003*. Canberra: Australian Institute of Health and Welfare, 2004.
  47. US Department of Health and Human Services. *US National Healthcare Quality Report, 2005*. Rockville, MD: Agency for Healthcare Research and Quality, 2006.

48. Kramers P. The ECHI project: health indicators for the European Community. *Eur J Public Health* 2003;13:101-06.
49. The Commonwealth Fund's International Working Group on Quality Indicators. First Report and Recommendations of The Commonwealth Fund's International Working Group on Quality Indicators. *A report to the Health Ministers of Australia, Canada, New Zealand, the United Kingdom and the United States*. New York: The Commonwealth Fund, 2004.
50. World Health Organization. *The World Health Report 2000*. Health systems: improving performance. Geneva: World Health Organization, 2000.
51. Klassen A, Miller A, Anderson N, Shen J, Schiariti V, O'Donnell M. Performance measurement and improvement frameworks in health, education and social service systems: a systematic review. *Int J Quality Health Care* 2010;22:44-69.
52. Plochg T, Klazinga NS. Community-based integrated care: myth or must? *International Journal for Quality in Health Care* 2002;14:91-101.
53. Smith P, Mossialos E, Leatherman S, Papanicolas I, editors. *Performance measurement for health system improvement. Experiences, challenges and prospects*. Cambridge: Cambridge University Press, 2009.
54. Hurtado M, Swift E, Corrigan J, editors. *Envisioning the national health care quality report. The Institute of Medicine*. Washington: National Academy Press, 2001.
55. Legido-Quigley H, McKee M, Walshe K, Sunol-Sala R, Nolte E, Klazinga NS. How can quality of health care be safeguarded across the European Union? *BMJ* 2008;336:920-23.
56. Roland M. Linking physician pay to quality of care: a major experiment in the UK. *N Engl J Med* 2004;351:1448-54.
57. Doran T, Roland M. Lessons from major initiatives to improve primary care in the United Kingdom. *Health Affairs* 2010;29:1023-29.
58. Davies H. *Measuring and reporting the quality of health care: issues and evidence from the international research literature*. Edinburgh: NHS Quality Improvement Scotland, 2005.
59. Campbell S, Braspenning J, Hutchinson A, Marshall M. Research methods used in developing and applying quality indicators in primary care. *BMJ* 2003;326:816-19.
60. Joint Commission on Accreditation of Healthcare Organizations. *Primer on indicators development and application*. Oakbrook Terrace, IL: Joint Commission on Accreditation of Healthcare Organizations, 1990.
61. Walshe K. International comparisons of the quality of health care: what do they tell us? *Quality and Safety in Health Care* 2003;12:4-5.
62. National Quality Forum. Measure evaluation criteria. December 2009. [Online] Available at [http://www.qualityforum.org/Measuring\\_Performance/Subsubmitting\\_Standards/Measure\\_Evaluation\\_Criteria.aspx](http://www.qualityforum.org/Measuring_Performance/Subsubmitting_Standards/Measure_Evaluation_Criteria.aspx) (Accessed on 23 November 2010).
63. Pringle M, Wilson T, Grol R. Measuring 'goodness' in individuals and healthcare systems. *BMJ* 2002;325:704-7.
64. McGlynn E, Asch S, Adams J, Keesey J, Hicks J, DeCristofaro A, et al. The quality of health care delivered to adults in the United States. *N Engl J Med* 2003;348:2635-45.

65. OECD. The OECD Health Care Quality Indicators Project. Background paper for the first meeting of the Expert Group. Paris: OECD, 2003.
66. National Centre for Health Outcomes Development. Evaluating the quality of clinical and health indicators. Available at <http://www.nchod.nhs.uk/NCHOD/Method.nsf/d3034ecd39b65e4965256cd2001d834f/7617d49c31d947118025701f004f1e84!OpenDocument> (accessed 24 March 2009), 2005.
67. Hussey PS, Anderson GF, Osborn R, Feek C, McLaughlin V, Millar J, et al. How does the quality of care compare in five countries? *Health Affairs* 2004;23:89-99.
68. Westert G, van den Berg M, Zwakhals S, de Jong J, Verkleij H. *Dutch Health Care Performance Report 2010*. Bilthoven: National Institute for Public Health and the Environment, 2010.
69. Lim Y, Mattke S, Wu H. *A performance measurement framework and initial measures for the Singapore healthcare system*. Santa Monica: Rand Corporation, 2008.
70. Marshall M, Shekelle P, McGlynn E, Campbell S, Brook R, Roland M. Can health care quality indicators be transferred between countries? *Quality and Safety in Health Care* 2003;12:8-12.
71. Heuschmann P, Biegler M, Busse O, Elsner S, Grau A, Hasenbein U, et al. Development and implementation of evidence-based indicators for measuring quality of acute stroke care. *Stroke* 2006;37:2573-78.
72. Steel N, Melzer D, Shekelle P, Wenger N, D F, McWilliams B. Developing quality indicators for older adults: transfer from the USA to the UK is feasible. *Qual Saf Health Care* 2004;13:260-64.
73. van der Ploeg E, Depla M, Shekelle P, Ritger H, Mackenbach J. Developing quality indicators for general practice care for vulnerable elders; transfer from US to The Netherlands. *Qual Saf Health Care* 2008;17:291-95.
74. Brook R, Chassin M, Fink A, Solomon D, Koseoff J, Park R. A method for the detailed assessment of the appropriateness of medical technologies. *Int J Technol Assessment Health Care* 1986;2:53-63.
75. Nolte E, McKee M, Wait S. Describing and evaluating health systems. In: Bowling A, Ebrahim S, editors. *Handbook of health research methods: investigation, measurement and analysis*. Maidenhead: Open University Press, 2005:12-43.
76. Bevan G, Hood C. Have targets improved performance in the English NHS? *BMJ* 2006;332:419-22.
77. Anderson G, Brown A. Appropriateness ratings: overuse, underuse, or misuse? *Lancet* 2001;358:1475-76.
78. Keyhani S, Siu A. The underuse of overuse research. *Health Services Research* 2008;43:1923-30.
79. Sachverständigenrat für die konzertierte Aktion im Gesundheitswesen. *Bedarfsgerechtigkeit und Wirtschaftlichkeit*. Band III Über-, Unter- und Fehlversorgung. Bonn: Sachverständigenrat für die konzertierte Aktion im Gesundheitswesen., 2001.
80. Nolte E, Bain C, McKee M. Population health. In: Smith P, Mossialos E, Leatherman S, Papanicolas I, editors. *Performance measurement for health system improvement: experiences, challenges and prospects*. Cambridge: Cambridge University Press, 2009.

81. Hussey P, de Vries H, Romley J, Wang M, Chen S, Shekelle P, et al. A systematic review of health care efficiency measures. *Health Services Research* 2009;44:784-805.
82. McGlynn E. *Identifying, categorizing, and evaluating health care efficiency measures: final report* (prepared by the Southern California Evidence-based Practice Center – RAND Corporation). Rockville, MD: Agency for Healthcare Research and Quality, 2008.
83. NHS Institute for Innovation and Improvement. NHS Better Care, Better Value indicators (incorporating Opportunity Locator). [Online] Available at <http://www.productivity.nhs.uk/Dashboard/For/National/And/25th/Percentile> (accessed on 30 december 2010).
84. Shekelle P. Public performance reporting on quality information. In: Smith P, Mossialos E, Papanicolas I, Leatherman S, editors. *Performance measurement for health system improvement*. Cambridge: Cambridge University Press, 2009:537-51.
85. Nutley S, Smith PC. League tables for performance improvement in health care. *Journal of Health Services Research and Policy* 1998;3:50-7.
86. Berwick D, James B, Coye M. Connections between quality measurement and improvement. *Medical Care* 2003;41(Suppl. 1)(I30-38).
87. Marshall MN, Shekelle PG, Leatherman S, Brook RH. The public release of performance data: what do we expect to gain? A review of the evidence. *JAMA* 2000;283:1866-74.
88. Hibbard J, Stockard J, Tusler M. Hospital performance reports: impact on quality, market share, and reputation. *Health Affairs* 2005;24:1150-60.
89. Chassin MR. Achieving and sustaining improved quality: lessons from New York State and cardiac surgery. *Health Affairs* 2002;21:40-51.
90. Hollenbeak C, Gorton C, Tabak Y, Jones J, Milstein A, Johannes R. Reductions in mortality associated with intensive public reporting of hospital outcomes. *Am J Medical Quality* 2008;23:279-86.
91. Werner R, Asch X. The unintended consequences of publicly reporting quality information. *JAMA* 2005;239:1239-44.
92. Schneider E, Lieberman T. Publicly disclosed information about the quality of health care: response of the US public. *Qual Health Care* 2001;10:96-103.
93. Doran T, Fullwood C, Reeves D, Gravelle H, Roland M. Should physicians be able to exclude individual patients from pay-for-performance targets? Analysis of exception reporting in the English pay-for-performance scheme. *N Engl J Med* 2008;359:274-84.
94. NHS Information Centre. The Quality and Outcomes Framework Exception Reporting 2008/09. [Online] Available at <http://www.ic.nhs.uk/statistics-and-data-collections/audits-and-performance/the-quality-and-outcomes-framework/the-quality-and-outcomes-framework-exception-reporting-2008-09> (Accessed on 16 November 2010).
95. Powell A, Davies H, Thomson R. Using routine comparative data to assess the quality of health care: understanding and avoiding common pitfalls. *Qual Saf Health Care* 2003;12:122-28.

96. MacLean C, Louie R, Shekelle P, Roth C, Saliba D, Higashi T, et al. Comparison of administrative data and medical records to measure the quality of medical care provided to vulnerable older patients. *Medical Care* 2006;44:141-48.
97. Generating Medicare Physician Quality Performance Measurement Results (GEM) Project. Physician and other medical provider grouping and patient attribution. [Online] Available at [http://www.cms.gov/GEM/05\\_TechnicalDocuments.asp#TopOfPage](http://www.cms.gov/GEM/05_TechnicalDocuments.asp#TopOfPage) (Accessed on 28 November 2010).
98. Doran T, Fullwood C, Gravelle H, Reeves D, Kontopantelis E, Hiroeh U, et al. Pay for performance programs in family practices in the United Kingdom. *N Engl J Med* 2006;355:375-94.
99. Romano P, Hussey PS, Ritley D. *Selecting quality and resource use measures: a decision guide for Community Quality Collaboratives*. Rockville: Agency for Healthcare Research and Quality, 2010.
100. Fleetcroft R, Cookson R. Do the incentive payments in the new NHS contract for primary care reflect likely population health gains? *J Health Serv Res Policy* 2006;11:27-31.
101. Dixon A, Khachatryan A. A review of the public health impact of the Quality and Outcomes Framework. *Qual Prim Care* 2010;18:133-38.
102. Reeves D, Campbell S, Adams J, Shekelle P, Roland M. Combining multiple indicators of clinical quality. An evaluation of different analytic approaches. *Medical Care* 2007;45:489-96.
103. Leon D, Vagero D, Olausson P. Social class differences in infant mortality in Sweden: comparison with England and Wales. *BMJ* 1992;305:867-691.
104. Stirbu I, Kunst A, Bos V, Mackenbach J. Differences in avoidable mortality between migrants and the native Dutch in The Netherlands. *BMC Public Health* 2006;6:78.
105. Healy J, Sharman E, Lokuge B. *Health Systems in Transition: Australia*. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory of Health Systems and Policies 2006.
106. OECD. *OECD health data 2010, June: statistics and indicators*, version 06/29/2010. Paris: Organisation for Economic Co-operation and Development, 2010.
107. Armstrong BK, Gillespie JA, Leeder SR, Rubin GL, Russell LM. Challenges in health and health care for Australia. *Med J Australia* 2007;187(9):485-89.
108. The Commonwealth Fund. The Australian Health Care System, 2009. [Online] Available at [http://www.commonwealthfund.org/Topics/International-Health-Policy/Countries/-/media/Files/Publications/Other/2010/Jun/International%20Profiles/1417\\_Squires\\_Intl\\_Profiles\\_Australia.pdf](http://www.commonwealthfund.org/Topics/International-Health-Policy/Countries/-/media/Files/Publications/Other/2010/Jun/International%20Profiles/1417_Squires_Intl_Profiles_Australia.pdf) (Accessed on 17 November 2010).
109. Schmid A, Wendt C. The changing role of the state in healthcare service provision. In: Rothgang H, Cacace M, Frisina L, Grimmeisen S, Schmid A, Wendt C, editors. *The state and healthcare: comparing OECD countries*. Palgrave Macmillan, 2010.
110. Australian Institute of Health and Welfare. *Medical labour force*. National Health Labour Force Series No. 44. Canberra: Australian Institute of Health and Welfare, 2010.

111. Willis E. The Australian health care system. In: Willis E, Reynolds L, Keleher H, editors. *Understanding the Australian health care system*. Sydney: Churchill Livingstone Elsevier, 2009.
112. Australian Medical Association. Becoming a doctor and bonded medical school places – a guide for prospective medical students. [Online] Available at: <http://www.ama.com.au/node/4130> (Accessed on 17 November 2010).
113. Howard S, Hordacre A, Moretti C, Kalucy E. *Summary Data Report of the 2007-2008 Annual Survey of Divisions of General Practice*. Adelaide: Primary Health Care Research & Information Service, Discipline of General Practice, Flinders University, and Australian Government Department of Health and Ageing, 2009.
114. Gardner KL, Sibthorpe B, Longstaff D. National quality and performance system for Divisions of General Practice: early reflections on a system under development. *Australia and New Zealand Health Policy* 2008;5(8).
115. Hall J. Health-care reform in Australia: Advancing or side-stepping? *Health Economics* 2010;19:1259–63.
116. Ettelt S, Nolte E, Mays N, Thomson S, McKee M, & The International Healthcare Comparisons Network. *Health care outside hospital: Accessing generalist and specialist care in eight countries*. Copenhagen: WHO Regional Office for Europe on behalf of European Observatory of Health Systems and Policies, 2006.
117. Scott A, Schurer S, Jensen PH, Sivey P. *The effects of financial incentives on quality of care: the case of diabetes*. The University of York: Health Econometrics and Data Group, 2008.
118. Glasgow N, Zwar N, Harris M, Hasan I, Jowsey T. Chapter 8: Australia. In: Nolte E, Knai C, McKee M, editors. *Managing chronic conditions: experience in eight countries*. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory of Health Systems and Policies, 2008.
119. Australian National Audit Office. *Practice Incentives Program. Audit Report No.5 2010–11*. Canberra: Commonwealth of Australia, 2010.
120. Scott A, Coote W. Whither Divisions of General Practice? An empirical and policy analysis of the impact of Divisions within the Australian health care system. *MJA* 2007;187:95-99.
121. McDonald J, Harris MF, Cumming J, Davies GP, Burns P. The implementation and impact of different funding initiatives on access to multidisciplinary primary health care and policy implications. *MJA* 2008;188(8 suppl.):69-72.
122. Duckett S, Daniels S, Kamp M, Stockwell A, Walker G, Ward M. Pay for performance in Australia: Queensland's new Clinical Practice Improvement Payment. *J Health Serv Res Policy* 2008;13:174–77.
123. Medicare Australia. Practice Incentives Program (PIP). [Online] Available at: <http://www.medicareaustralia.gov.au/provider/incentives/pip/index.jsp#N10029> (Accessed on 22 November 2010).
124. The Royal Australian College of General Practitioners. *Standards for general practices* (4th edition). South Melbourne: The Royal Australian College of General Practitioners, 2010.
125. Department of Health and Ageing. *Building a 21st Century Primary Health Care System. Australia's First National Primary Health Care Strategy*. Canberra: Department of Health and Ageing, 2010.

126. Scott A, Schurer S, Jensen PH, Sivey P. The effects of an incentive program on quality of care in diabetes management. *Health Economics* 2009;18:1091–108.
127. Department of Health and Ageing. Annual report 2009–2010: Better health, better care, better life. [Online] Available at: <http://www.health.gov.au/internet/main/publishing.nsf/Content/annual-report2009-10> (Accessed on 22 November 2010).
128. Scott A, Coote W. *The value of the divisions network: an evaluation of the effect of divisions of general practice on primary care performance*. Melbourne: Melbourne Institute Report No. 8, 2007.
129. Marchildon G. *Health systems in transition: Canada*. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies, 2005.
130. Jiwani I, Dubois CA. Chapter 9: Canada. In: Nolte E, Knai C, McKee M, editors. *Managing chronic conditions: experience in eight countries*. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory of Health Systems and Policies, 2008.
131. Cacace M, Schmid A. The Healthcare Systems of the USA and Canada: Forever on Divergent Paths? *Social Policy & Administration* 2008;42:396–417.
132. Canadian Institute for Health Information (CIHI). Physicians in Canada: average gross fee-for-service payments, 2005–2006. 2008; [Online] Available at: [http://dsp-psd.pwgsc.gc.ca/collection\\_2008/cihi-icis/H115-37-2006E.pdf](http://dsp-psd.pwgsc.gc.ca/collection_2008/cihi-icis/H115-37-2006E.pdf) (Accessed on 24 November 2010).
133. Ministry of Health and Long-Term Care. Local Health System Integration Act, 2006. [Online] Available at: [http://www.health.gov.on.ca/english/public/legislation/lhins/hu\\_lhins.html](http://www.health.gov.on.ca/english/public/legislation/lhins/hu_lhins.html) (Accessed on 14 November 2010).
134. Ontario Health Quality Council (OHQC) and Ontario Joint Policy and Planning Committee. *Accountability agreements in Ontario's health system: how they can accelerate quality improvement and enhance public reporting?* White Paper. Toronto, Canada: Ontario Health Quality Council, 2008.
135. Ministry of Health and Long-term Care. Local Health Integration Networks LHIN history. [Online] Available at [http://www.health.gov.on.ca/transformation/lhin/lhin\\_history.html](http://www.health.gov.on.ca/transformation/lhin/lhin_history.html) (Accessed on 16 April 10).
136. Lomas J, Brown AD. Research and advice giving: a functional view of evidence-informed policy advice in a Canadian ministry of health. *The Milbank Quarterly* 2009;87:903-26.
137. Ministry of Health and Long-Term Care (MOHLTC). LHIN effectiveness review. [Online] Available at: [http://www.health.gov.on.ca/transformation/lhin/effectiveness\\_review\\_report.pdf](http://www.health.gov.on.ca/transformation/lhin/effectiveness_review_report.pdf) (Accessed on 22 November 2010).
138. Ministry of Health and Long-Term Care. Ontario's Health-Based Allocation Model (HBAM). [Online] Available at <http://www.waterloowellingtonlhin.on.ca/uploadedFiles/HBAMOverview.pdf> (Accessed on 27 November 2010).
139. Ministry of Health and Long-Term Care (MOHLTC). The Excellent Care for All Act, 2010. [Online] Available at:

- [http://www.health.gov.ca/en/legislation/excellent\\_care/](http://www.health.gov.ca/en/legislation/excellent_care/) (Accessed on 18 November 2010).
140. Ministry of Health and Long-Term Care. Family health teams advancing family health care: a guide to physician compensation, v3.0. Toronto: Ministry of Health and Long-Term Care, 2009.
  141. LHIN Collaborative. Health system indicator steering committee. Communiqué #1. [Online] Available at [www.aohc.org/](http://www.aohc.org/) (Accessed on 27 November 2010). 2010.
  142. LHIN Collaborative. Health system indicator steering committee. Communiqué #4. [Online] Available at [www.aohc.org/](http://www.aohc.org/) (Accessed on 27 November 2010). 2010.
  143. South West LHIN. The South West LHIN Quarterly Performance Dashboard. [Online] Available at <http://www.southwestlhin.on.ca/Page.aspx?id=4584> (Accessed on 27 November 2010). 2010.
  144. Government of Alberta. Alberta Health and Wellness, 2010/2011 Funding Allocation. 2010; [Online] Available at: <http://www.health.alberta.ca/documents/Funding-Allocation-10-11.pdf> (Accessed on 24 November 2010).
  145. Liepert R. Recent changes to health structures in Alberta. [Online] Available at: <http://www.healthinnovationforum.org/2009/nov/01/recent-changes-health-structures-alberta/> (Accessed on 24 November 2010). 2009.
  146. Alberta Health Services (AHS). About AHS.[Online] Available at: <http://www.albertahealthservices.ca/about.asp> (Accessed on 24 November 2010).
  147. Alberta Health Services (AHS). Recruitment areas. [Online] Available at: <http://www.healthjobs.ab.ca/partners/default.aspx> (Accessed on 24 November 2010).
  148. Alberta Health Services (AHS). Health programs and services. [Online] Available at: <http://www.health.alberta.ca/health-services.html> (Accessed on 24 November 2010).
  149. Marchildon G, O'Fee K. *Health care in Saskatchewan: an analytical profile*. Regina: Canadian Plains Research Center and the Saskatchewan Institute of Public Policy, 2007.
  150. Saskatchewan Cancer Agency. *2009/2010 annual report*. Regina: Saskatchewan Cancer Agency, 2010.
  151. Cancer Care Ontario. Performance measurement, public reporting and the quality of cancer care. [Online] Available at: <http://www.ontla.on.ca/library/repository/mon/13000/259093.pdf> (Accessed on 14 November 2010).
  152. Cancer Care Ontario. Cancer services and policy research unit. [Online] Available at: <http://www.cancercare.on.ca/common/pages/UserFile.aspx?fileId=13220> (Accessed on 23 November 2010).
  153. Duvalko K, Sherar M, Sawka C. Creating a system for performance improvement in cancer care: Cancer Care Ontario's clinical governance framework. *Cancer Control* 2009;16:293-302.
  154. Greenberg A, Angus H, Sullivan T, Brown A. Development of a set of strategy-based system-level cancer care performance indicators in Ontario, Canada. *International J Qual Health Care* 2005;17:107-14.

155. Thomson S, Foubister T, Mossialos E. *Financing health care in the European Union: Challenges and policy responses*. Copenhagen: World Health Organization on behalf of the European Observatory on Health Systems and Policies, 2009.
156. Department of Health. *Equity and excellence: liberating the NHS*. London: The Stationery Office Limited, 2010.
157. Boyle S. Payment by Results in England. *Eurohealth* 2007;13:12-16.
158. Boyle S. The English health care system. In: The Commonwealth Fund, editor. *International profiles of health care systems*. New York: The Commonwealth Fund, 2010:19-22.
159. Department of Health. *Resource allocation: weighted capitation formula* (sixth edition). Leeds: Department of Health, 2008.
160. Ettelt S, Nolte E, Thomson S, Mays N. *Health care capacity planning: a review of international experience*. Copenhagen: World Health Organization on behalf of the European Observatory on Health Systems and Policies, 2008.
161. Department of Health. *Resource allocation to primary care trusts 2009-10 and 2010-11: equality impact assessment*. London: Department of Health, 2009.
162. NHS Employers. General Medical Services contract. [Online] Available at <http://www.nhsemployers.org/PayAndContracts/GeneralMedicalServicesContract/Pages/Contract.aspx> (Accessed on 22 November 2010).
163. Secretary of State for Health. *The Primary Medical Services (Directed Enhanced Services) (England) Directions 2010*. London, 2010.
164. Department of Health. Enhanced services. [Online] Available at: [http://webarhive.nationalarchives.gov.uk/+www.dh.gov.uk/en/Healthcare/Primarycare/Primarycarecontracting/DH\\_4126088](http://webarhive.nationalarchives.gov.uk/+www.dh.gov.uk/en/Healthcare/Primarycare/Primarycarecontracting/DH_4126088) (Accessed on 22 November 2010).
165. Department of Health. *The operating framework for 2010/11 for the NHS in England*. London: Department of Health, 2009.
166. House of Commons Health Committee. *Commissioning*. Volume 1. London: The Stationery Office, 2010.
167. NHS Employers. Quality and Outcomes Framework. [Online] Available at <http://www.nhsemployers.org/PayAndContracts/GeneralMedicalServicesContract/QOF/Pages/QualityOutcomesFramework.aspx> (Accessed on 6 January 2011).
168. Department of Health. The GP patient survey. [Online] Available at <http://www.gp-patient.co.uk/> (Accessed on 22 November 2010).
169. NHS Information Centre for Health and Social Care. Quality and Outcomes Framework. Online GP practice results database. [Online] Available at: <http://www.qof.ic.nhs.uk/> (Accessed on 22 November 2010).
170. NHS Institute for Innovation and Improvement. Commissioning for Quality and Innovation (CQUIN) payment framework. [Online] Available at [http://www.institute.nhs.uk/world\\_class\\_commissioning/pct\\_portal/cquin.html](http://www.institute.nhs.uk/world_class_commissioning/pct_portal/cquin.html) (Accessed on 26 November 2010).
171. Doran T, Fullwood C, Kontopantelis E, Reeves D. Effect of financial incentives on inequalities in the delivery of primary clinical care in England: analysis of clinical activity indicators for the quality and outcomes framework. *Lancet* 2008;372:728-36.

172. Sampson F, Pickin M, O’Cathain A, Goodall S, Salisbury C. Impact of same-day appointments on patient satisfaction with general practice appointment systems. *Br J Gen Pract* 2008;58:641-43.
173. Paris V, Devaux M, Wei L. *Health systems institutional characteristics: a survey of 29 OECD countries*. Paris: OECD, 2010.
174. Accident Compensation Corporation. Introduction to ACC. [Online] Available at <http://www.acc.co.nz/about-acc/overview-of-acc/introduction-to-acc/index.htm> (Accessed on 22 November 2010).
175. Smith J. Critical analysis of the implementation of the Primary Health Care Strategy implementation and framing of issues for the next phase. [Online] Available at [http://www.moh.govt.nz/moh.nsf/pagesmh/9561/\\$File/critical-analysis-primary-health-care-strategy-sept09.pdf](http://www.moh.govt.nz/moh.nsf/pagesmh/9561/$File/critical-analysis-primary-health-care-strategy-sept09.pdf) (Accessed on 25 November 2010).
176. New Zealand Ministry of Health. Primary health care, PHO enrolment demographics 2010 Q4. [Online] Available at <http://www.moh.govt.nz/moh.nsf/indexmh/phcs-pho-enrolment> (Accessed on 26 November 2010).
177. New Zealand Ministry of Health. Population based funding. [Online] Available at [http://www.moh.govt.nz/moh.nsf/wpg\\_index/About-population+based+funding](http://www.moh.govt.nz/moh.nsf/wpg_index/About-population+based+funding) (Accessed on 26 November 2010).
178. Cumming J, Mays N, Gribben B. Reforming primary health care: is New Zealand’s primary health care strategy achieving its early goals? *Australia and New Zealand Health Policy* 2009;5:24.
179. New Zealand Ministry of Health Ministry of Health. *The New Zealand health and disability system: organisations and responsibilities briefing to the Minister of Health. November 2008*. Wellington: Ministry of Health, 2008.
180. New Zealand Ministry of Health. Primary health care funding. [Online] Available at <http://www.moh.govt.nz/moh.nsf/indexmh/phcs-funding> (Accessed on 26 November 2010)
181. New Zealand Ministry of Health. Primary health care; Funding. [Online] Available at <http://www.moh.govt.nz/moh.nsf/indexmh/phcs-funding> (Accessed on 26 November 2010).
182. New Zealand Ministry of Health. Primary health care. Care Plus. [Online] Available at <http://www.moh.govt.nz/moh.nsf/indexmh/phcs-funding-careplus> (Accessed on 26 November 2010).
183. New Zealand Ministry of Health. Primary health care. Very Low Cost Access Payments. [Online] Available at <http://www.moh.govt.nz/moh.nsf/indexmh/phcs-funding-lowcost> (Accessed on 26 November 2010).
184. New Zealand Ministry of Health. *Governance guide for primary health organisations*. Wellington: Department of Health, 2007.
185. New Zealand Ministry of Health. *Accountability: a better way of working together. Report of the DHB Accountability Arrangements Review*. Wellington: Ministry of Health 2007.
186. New Zealand Ministry of Health. Advice. [Online] Available at [http://www.moh.govt.nz/moh.nsf/Files/dhb-performance/\\$file/dhb-performance-q4-2010.pdf](http://www.moh.govt.nz/moh.nsf/Files/dhb-performance/$file/dhb-performance-q4-2010.pdf) (Accessed on 26 November 2010).

187. New Zealand Ministry of Health. Primary health care. Performance payments. [Online] Available at <http://www.moh.govt.nz/moh.nsf/indexmh/phcs-funding-performance> (Accessed on 26 November 2010).
188. District Health Boards New Zealand. PHO Performance Programme, Annual Report. [Online] Available at <http://www.dhbnz.org.nz/Site/SIG/pho/PHO/Annual-Reports.aspx> (Accessed on 26 November).
189. Martin Jenkins. Evaluation of the PHO Performance Programme. Wellington: Martin Jenkins, 2008.