



Quality improvement financial incentives for general practitioners

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List of abbreviations

ACSQHC	Australian Commission on Safety & Quality in Health Care
BMI	Body Mass Index
BP	Blood Pressure
CAD	Coronary Artery Disease
CMS	Centers for Medicare and Medicaid Services
COBIC	Commissioning for Outcomes-Based Incentivised Contracts
CPOE	Computerized Provider Order Entry
CQM	Clinical Quality Measure
CQRS	Calculating Quality Reporting Service
DES	Direct Enhanced Service
DHB	District Health Boards
EHR	Electronic Health Record
EP	Eligible Professional
FFS	Fee-for-Service
GP	General Practitioner
GPES	General Practice Extraction Service
GPII	General Practice Immunisation Incentive Scheme
HIIRC	Health Improvement and Innovation Research Centre
IT	Information Technology
IVD	Ischemic Vascular Disease
LES	Local Enhanced Service
NES	National Enhanced Service
NHS	National Health Service
NZ	New Zealand
P4P	Pay-for-Performance
PCEHR	Personally Controlled Electronic Health Record
PHC	Primary Health Care
PHO	Primary Health Organisation
PHOPMP	Primary Health Organisation Performance Management Programme
PIP	Practice Incentives Program
HbA1c	Haemoglobin
QIC	Quality Improvement Committee
QOF	Quality and Outcomes Framework
RACGP	Royal Australian College of General Practitioners
RRMA	Rural, Remote and Metropolitan Areas
SES	Socioeconomic Status
SWPE	Standardised Whole Patient Equivalent
UK	United Kingdom
US	United States

Executive summary

Policy context

Australia's recently released National Primary Health Care Strategic Framework aims to improve access and reduce inequity in health care using a range of strategies including funding models and incentives as mechanisms to promote high quality care. Currently, the Australian health system relies on a mixed funding model with a focus on fee-for-service, which does not actively reward quality of care. Blended models, which include financial incentives such as pay for performance (P4P), have been proposed to encourage improvements in the quality and safety of health care provided, and the uptake and meaningful use of electronic health records (EHRs). Nevertheless, incentives are not sufficient to impact on care provision without both appropriate infrastructure and the engagement of general practice.

Key findings

Quality improvement includes aspects of self-reflection and benchmarking, with continued evaluation to identify where additional improvements to practice can be made. Measures of the quality of care are typically structure (e.g. related to an organisation's operations), process (e.g. clinical guidelines or care pathways) or outcomes-based (e.g. physiological indicators). Improvements can be measured in relative or absolute terms. The likelihood of engaging with incentives and the behavioural responses of health professionals are affected by the different characteristics of financial incentives, which may be directed at networks of practices, individual practices, or specific health care professionals. Payments may be offered as a bonus or addition to usual earnings, or may be withheld if practices do not achieve desired outcomes. Payments may be prospective or retrospective and may be linked to fixed thresholds or individual patients.

In **Australia**, sets of clinical indicators for quality improvement have been developed and are continually revised by the Royal Australian College of General Practitioners and the Australian Commission on Safety and Quality in Health Care. These standards assist general practices and practitioners to establish and implement processes to monitor and improve the quality of their chosen services. Similarly, specific financial incentive schemes such as the Practice Incentives Program incorporate P4P (with sign on and service incentive payments) and practice-based capacity payments. It is not clear whether the incentives improve quality of care, as the evidence of effectiveness is limited and the results are not robust. P4P incentives have been shown to have some influence on diabetes care, but there is also evidence to suggest that while signing on to services may demonstrate high uptake, services are often provided, but not claimed through the incentive program (Greene, 2013).

The **United Kingdom's** quality improvement approach relates to the Quality and Outcomes Framework (QOF) introduced in 2004. Coordinated by PHC organisations, this payment-for-quality scheme comprises 146 indicators, with related payments constituting up to one-third of a practice's income. Absolute improvements have been seen with a number of indicators including control of blood sugar levels among patients with diabetes, and provision of smoking cessation advice (Kontopantelis et al., 2013). Diabetes care is a particular focus of the QOF scheme, with ten per cent of the total indicators allocated to this condition. The QOF also includes a large investment in technology which is likely to have contributed to increases in recorded levels of care. Criticisms of the approach relate to the readily achievable levels of indicator targets, which provide little risk to practice incomes and little incentive for improvements over and above the specified levels. Enhanced Services are another significant financial incentive or lever in the UK quality improvement approach

towards specific diseases. General practitioners affiliated with Local Enhanced Services had a higher probability of achieving QOF diabetes indicators than those without involvement of these community-based services.

In the **United States**, there is widespread application of P4P incentives. Clinical quality is most commonly incentivised, with over 60 per cent of programs offering bonus payments rather than withholding approaches, and the majority of programs providing one annual payment. In 2007, a pay-for-reporting model was introduced (the Physician Quality Reporting System) with physicians entitled to a lump sum payment if they met the criteria for submitting quality data based on a set of 74 indicators. The 2010 Affordable Care Act made public reporting of quality measures compulsory. There has been particular emphasis in the US on EHRs with the Centers for Medicare and Medicaid Services delivering a successful EHR incentive program to encourage transition to, adoption of, and meaningful use of EHRs. Evaluated P4P programs have illustrated benefits for clinical outcomes such as depression severity, appropriate prescribing, blood pressure control and smoking cessation (Bardach et al., 2013, Unützer et al., 2012).

Canada has a predominantly fee-for-service system though the different regions have their own approaches to using financial incentives for quality improvement. The Health Council of Canada is responsible for monitoring progress in improving the quality of the health system, whereas local councils have been established to support initiatives operating at provincial and territorial levels. Canadian incentives for preventive services (incorporating two parts: contacting patients and achieving high rates of coverage) have enabled improvements for provision of influenza vaccinations, pap smears, mammograms and colorectal cancer screening (Hurley et al., 2011, Lau et al., 2012). In some cases, the incentivised actions required additional infrastructure or equipment, hence uptake was limited among practices. In contrast, where incentives were linked to current standard practices, uptake occurred more readily.

In 2010, a Health Quality and Safety Commission was established to lead a national quality program in **New Zealand**. However, much of the Commission's focus was on hospitals. Currently, there is limited information available about financial incentives in PHC in NZ, with a proposed shift towards non-financial incentives as drivers for improvements in quality. Capitation funding is widespread in NZ though there are additional funds available for primary health organisations working to address chronic disease management, health promotion and improving access. In 2006, the Primary Health Organisation Performance Management Programme was developed and included P4P against performance indicators as a core component, yet, despite positive preliminary results and the availability of Primary Health Organisations', District Health Boards' and National performance scores, no formal evaluation data are available.

Across all literature in this review, there was a lack of explicit acknowledgement of whether the outcomes measured were absolute or relative improvement.

Policy considerations

Based on the findings of this report, the following points may be considered

Who gets paid?

- Information is lacking about distribution of payments
- There is a range of different systems with some incentives directed at groups or organisations and others directed at individuals
- Future programs should acknowledge that team-based care is central to PHC

How much is enough?

- Strength of financial incentives is often not well reported
- Low incentives are unlikely to motivate behaviour change and/or the administrative burden related to claiming a minimal reward may not be worthwhile
- High incentives raise overall health system costs and perverse incentives may prevail
- A tiered series of tiered or differentiating targets based on baseline performance and/or a piece-rate payment approach may be used for each appropriately managed patient

What are the consequences?

- Crowding in/out, exception rates, and gaming
- Coercive behaviour by GPs towards patients considered as non-compliant
- Conflict within workplaces by directing incentives at GPs
- The administrative burden of making claims for funds may be a disincentive especially in regions lacking resources or infrastructure (i.e. rural and remote)

Absolute versus relative improvement

- *Absolute improvement* is defined as the change in performance from baseline to follow-up; *relative improvement* is defined as the absolute improvement divided by the difference between the baseline performance and perfect performance (100%)
- Absolute targets are likely to be more effective than relative targets because they are transparent and create less uncertainty regarding the efforts to be eligible for payment
- Relative targets may reduce collaboration and dissemination of best practices because they encourage competition

Lack of quality data

- Challenges of publicly reported data, large datasets and limited enrolled populations
- Inconsistent units of analysis across evaluations of incentive effectiveness

Other influencers

- Processes and workforce availability
- Complexity of billing, administrative burden
- Accreditation processes, practice population composition and marketing of incentives affect practices' willingness and ability to engage with incentives
- The use of financial incentives alongside a range of non-financial incentives and other quality improvement strategies (i.e. performance tables, professional standards).

Methods

A thorough (non-systematic) reviewed of literature (Australia, UK, US, Canada and NZ) was undertaken with materials, published between 2011 and 2014, collected from academic and grey sources including but not limited to PubMed Trove, Google Scholar, Cochrane Database of Systematic Reviews, and Government websites. Key search terms included: "quality improvement", "financial incentive", and "pay for performance".

Context

One of the key strategic outcomes in the National Primary Health Care Strategic Framework (Standing Council on Health, 2013) is to improve access and reduce inequity in health care:

Primary health care is delivered through an integrated service system which provides high quality care across the country and actively addresses service gaps (Standing Council on Health, 2013, p 17).

Potential actions to achieve this outcome include exploring “funding models that include incentives for a focus on the health of the population, promote safety and quality and reduce preventable hospitalisations through primary and secondary prevention” (Strategic Outcome 2.3; p 18); and maximising “opportunities of eHealth, including the Personally Controlled Electronic Health Record (PCEHR) and Secure Messaging initiatives” (Strategic Outcome 2.5; p 13).

Australia’s current mixed funding model has a strong focus on fee-for-service (FFS) in the private health care sector (e.g. general practice), and salary arrangements in the publicly funded sector (e.g. hospitals). Quality of care is often not rewarded in these arrangements. Governments are continually reassessing blended payment systems to include financial incentives, such as payment for performance (P4P), which has the potential to achieve improvements in quality and safety of health care. Examples of financial incentives in Australia include the General Practice Immunisation Incentive Scheme (GPII), which provided bonus payments to general practitioners (GPs) for achieving immunisation targets (ended in May 2013); and the Practice Incentives Program (PIP), which provides bonus payments for practices that deliver improvements in any of ten different activities. For example, one of the PIP programs relates to encouraging adoption of eHealth technology “as it becomes available” (Medicare, 2013). To be eligible, practices are required to implement five key electronic processes: electronic health records (EHR); secure messaging; electronic clinical coding; electronic prescribing; and the PCEHR system. It is anticipated that the introduction of eHealth will positively impact on the quality of health care services in Australia by facilitating continuity of care and medical information flow.

However, establishment of the required infrastructure on its own is not sufficient to impact on quality and safety in primary health care (PHC). General practice engagement and application of an innovative approach with appropriate tools and capacity at the patient level is required to realise the full potential. There is a need to identify more effective ways of engaging GP support in the implementation of new systems and technologies in the Australian setting; and to encourage participation in schemes that foster continuous quality improvement.

This report reviews financial incentives that encourage improvements in the quality and safety of PHC, including how they have been implemented and how effective they have been. A key focus is examining strategies that assess and reward relative improvement in quality of care; and identifying patient-level measures that can be used to assess the effectiveness of any given quality improvement program and its associated initiatives.

Background

Quality improvement has been defined as a process within general practice through which the individuals who provide care adopt various approaches to self-reflection and benchmarking in order to understand and address the reasons for poor quality or variations in quality, and to identify where acceptable quality can be improved further. (Goodwin et al., 2011, p 27)

The Donabedian (1988) Model continues to be the dominant paradigm for assessing the quality of health care. The dimensions of care which the framework covers represent three types of information that may be collected in order to draw inferences about quality of care in a given system. Table 1 provides information about the framework, types of measures, targeted parts of the care process and examples of the measures and how they might be assessed. It is important to clarify that there is often confusion between process and proxy-outcome measures. For example, incorporating EHRs into general practice is a structure-based measure, whereas a GP using the EHR to record patient information or refer patients to other providers is process-based.

Table 1 Types of measures for assessing quality of care based on Donabedian's Framework

Measure type	Description	Targets	Examples	How measured
Structure-based	Encompasses all the factors that affect the context in which care is delivered	Structures, systems and processes in place to assure the quality and accountability of an organisation	Facilities Equipment Personnel Administration Protocols	Direct observation Supervisory checklists
Process-based	The sum of all actions that make up health care	Commonly includes diagnosis, treatment, preventive care, and patient education	Clinical guidelines Care pathways Management Records Diagnosis Treatment plan Sequencing	Participant observation Exit interviews Data quality assessment
Outcome-based	Contains all the effects of health care on patients or populations	Clinical, physiological & patient-centred	Mortality Quality of life Patient satisfaction Health status Completion of treatment	Patient/population surveys

*only structure and process can be manipulated

It is important to recognise that information about quality lies on a continuum from measures that are routinely available and data that are quantifiable, through to aspects of the quality of care that are more difficult to quantify and can only be measured through local audit, patient feedback and other qualitative methodologies. For example, assessing whether a patient is receiving effective care coordination requires service use data in addition to qualitative approaches. These include review meetings, case notes, general practice team meetings to identify, analyse and address quality issues, and proactive input from patient groups on the care they receive and experience of that care (Goodwin et al., 2011).

Improvements in quality of care (i.e. patient care, drug effectiveness, patient status and other key metrics) can be measured in relative or absolute terms. *Absolute improvement* is defined as the change in performance from baseline to follow-up; *relative improvement* is defined as the absolute improvement divided by the difference between the baseline performance and perfect performance (100%) (Jencks et al., 2003).

Different characteristics of financial incentives used in health care can influence the magnitude and direction of behavioural responses by physicians, including the method, type and timing of the incentive (Scott et al., 2011). The method of payment refers to payments being made in exchange for a variety of behaviours (Table 2). Payments may be offered as a bonus on top of usual earnings, or payments may be withheld from practices that did not achieve desired incentives (Scott et al., 2011). The timing of payments is also relevant to behaviour and may occur in advance (i.e. prospective payments) or after the behaviour has taken place (i.e. retrospective); and where there is no overall limit or where there is a cap on the total payments that can be made.

Table 2 Characteristics of financial incentives

Method of payment	Description
Salary	Payment for working over a specified time period
Fee-for-Service (FFS)	Payment for providing specific services
Capitation	Payment for providing care to a specific population
Pay-for-performance (P4P)	Payment for providing a pre-specified or increase in level of quality of care
Timing of payment	
Linear	Payment is made for each additional unit of service
Non-linear	Payment is conditional on reaching a threshold or benchmark, or the amount paid changes with each additional service

In terms of P4P specifically, payments can be offered with either a ‘tournament’ or a ‘piece-rate’ approach. ‘Tournament’ or ‘all or nothing’ methods have fixed thresholds that must be reached for the incentive to be rewarded. One of the challenges of this approach is that it may prevent physicians from attempting to improve beyond the threshold. The ‘piece-rate’ model encourages continuous improvement and reduces the likelihood of health professionals avoiding high-risk patients by rewarding physicians for each patient who receives quality care or achieves a benchmark. For example, each patient with diabetes receives HbA1c testing twice a year (Chien et al., 2012, Chien et al., 2010).

The most recent systematic review of financial incentives and quality of care suggests that within the current literature there is insufficient evidence to support or not support the use of financial incentives to improve the quality of PHC provided by primary care physicians (Scott et al., 2011).

Scott and colleagues suggest that the evidence is inconclusive because the evidence-base is limited, due to inconsistency in descriptions and poor reporting in the literature. This review will examine strategies that assess (measure), reward (incentivise) and influence quality improvement in general practice. This review includes financial incentives which reward relative and absolute improvements.

Aims and research questions

Specific questions and areas to be addressed in this review include:

- What international and national financial incentive schemes (including P4P) are relevant to quality improvement in PHC in the Australian setting?
 - Focus on schemes that reward *relative* improvement (though not limited to these)
 - Focus on schemes that include *meaningful* use of eHealth (i.e. beyond uptake)
- What financial incentives have effectively demonstrated improvements in quality of care?
 - To what extent have they changed provider behaviour?
 - To what extent have they improved health outcomes for patients?
- What are the potential barriers to financial incentives for quality improvement?
- What are the potential unintended consequences of financial incentives?
- What are the strengths of effective financial incentives?
- How have data been collected and used to influence performance?
 - What measures of *relative* and *absolute* quality improvement have been implemented?
 - To what extent have they been validated?

Methods

This report followed a 'rapid review' format (Grant and Booth, 2009). Rapid reviews are pragmatic literature reviews that focus on research evidence, with a view to facilitating evidence-based policy development. A range of peer-reviewed and grey literature sources were explored to identify relevant literature for this review. Once relevant material was located, a snowballing approach was used to identify additional material. Information was sourced from PubMed (with the PHC Search Filter), Cochrane Database of Systematic Reviews, TROVE, OpenGrey, GoogleScholar and Government websites. A set of keywords and subject headings were used to search each database (terms used were database dependent) around 'quality improvement', 'financial incentive', and 'pay for performance'. Abstracts were reviewed for suitability based on their relevance to PHC, GPs and the general practice setting.

The literature used in the review was limited to those sources published between 2011 and 2014. This specific time frame was selected in order to find material that would complement Scott et al.'s (2011) recent systematic review of financial incentives. Further, information on financial incentives in other countries was limited primarily to New Zealand (NZ), the United Kingdom (UK), Canada and the United States (US) where relevant. These countries were selected on the basis that they were perceived as being comparable countries in terms of the organisation, funding and delivery of PHC; or that they had a diversity of innovative models that may be used to inform policy in the Australian setting. It must be acknowledged that many other types of incentives also exist in other countries. However, due to language and time constraints, information sources were limited to those written in English. While information from countries other than those listed above was not explicitly excluded, specific searches for literature of other countries were not undertaken. In addition, in order to avoid duplication of effort and keep this review focused on current programs targeting quality

improvement and financial incentives, the most recent systematic review has been summarised in the background section of the report.

Findings

Australia

Quality improvement approach

In March 2012, the Royal Australian College of General Practitioners (RACGP) (2013) Council endorsed a small set of clinical indicators as a quality improvement tool for piloting in general practice. The intent of these indicators was to provide general practices with a voluntary tool to aid them in establishing, implementing and developing processes to monitor and improve the quality of their chosen services. The focus of the indicators is on the professionalism and diversity of general practice, targeting outcomes that are relevant to improved patient outcomes. At the same time, the Australian Commission on Safety and Quality in Health Care finalised indicators also designed for voluntary inclusion in quality improvement strategies at the local practice or service level. These are intended for local use by organisations and individuals providing PHC services (ACSQHC, 2012). It must be noted that recommendations regarding indicators for general practice were not in scope for the review outcomes. The RACGP, with other PHC stakeholder engagement, released the 4th edition of the Standards for General Practice in May 2013. These are designed to be a template for delivery of safe quality care in the increasingly complex Australian general practice environment; this document specifies 38 fewer indicators and more explanatory material and additional resources (Royal Australian College of General Practice, 2013). Practices can choose to be assessed against the Standards by an independent third party to gain formal 'accreditation'. Achieving independent accreditation against the Standards shows patients that the practice is serious about providing high quality, safe and effective care to standards of excellence determined by the general practice profession.

Incentive schemes for quality improvement

Established in 1998 to support general practice, the Practice Incentives Program (PIP) refers to a voluntary scheme administered by the Australian Department of Health and currently comprising ten incentives. Of interest to this report are the five incentives related to prescribing, diabetes, cervical screening, asthma and Indigenous health. Three of these are P4P incentives (diabetes, asthma, cervical screening) while the remainder are considered practice-based capacity payments (i.e. eHealth). P4P PIP incentives have two components—the sign-on payment and the service incentive payment (SIP). Diabetes and cervical screening also have outcomes payments targeted towards practices meeting a certain threshold (Medicare, 2014). In 2008-09, 67 per cent of practices across Australia were enrolled in the PIP, with average payments of AUS\$19 700 per full-time equivalent GP in participating practices. The PIP accounts for 5.5 per cent of Government funding for general practice (Willcox, 2011).

There have been significant organisational changes since the introduction of PIP (Willcox, 2011). Solo practices have halved and six of every ten practices now employ five or more GPs. Larger general practices were fostered due to general practice accreditation requirements and a trend towards corporatisation. Practice nurses are part of the general practice landscape more than ever, with 79 per cent of GPs working in practices with at least one practice nurse.

Evidence of effectiveness

In a recent good quality, mixed methods study, Greene (2013) examined the impact of a subset of P4P incentives on Australian GPs. In particular, this study focused on the payment of AUS\$40 and AUS\$100 in addition to FFS for providing patients with recommended diabetes and asthma treatment over a year, and AUS\$35 for screening women for cervical cancer who had not been screened in the last four years. The investigation attempted to triangulate the program's impact by examining both quantitative and qualitative data.

The first component of Greene's (2013) study tracked the use of four incentivised services by GPs to see whether they promoted changes in provider behaviour. By identification of unique billing codes in publicly available Medicare claims data, the researchers were able to describe whether there was an increase in the annual number of diabetes-related and cervical screening tests, pre-implementation (1995-2000) and post-implementation (2001-2010). The second component followed a unique panel subset of GPs from 2000 to 2009 ($N=1\ 131$). For inclusion in this randomly selected study sample, GPs had to be active at a given practice site (i.e. billed a minimum of 375 Medicare claims of any type in 2000). GPs from low socio-economic status (SES) areas were oversampled to examine whether there were differential program impacts for GPs practicing in areas of lower and higher SES. Two measures of P4P participation were utilised, one referring to whether a GP's practice was signed on to the specific incentive (diabetes or cervical cancer screening) and another which related to the number of services provided that were relevant PIP incentives (Diabetes: HbA1c and microalbumin; cervical cancer: diagnosis and treatment). The third component of the study included in-depth interviews with an Australia-wide convenience sample ($N=13$ GPs; $N=2$ practice managers) in 2011. The semi-structured interview guide included questions about why the practice did or did not sign on to the incentive program; what the participants' experience had been with each incentive; and the perceived influence of the incentive on behaviour and practice norms.

Findings from Greene's (2013) study indicated that, despite the incentives, diabetes service claims were infrequent relative to the number of HbA1c tests (11-17%) and microalbumin tests (20-30%) billed; that is, services were provided, but not claimed through the incentive program. However, the low number of diabetes incentive claims lodged was actually six times higher than the number of asthma incentive claims lodged. For cervical cancer screening and treatment, there were small increases in the number of both screens in the year pre-implementation of P4P incentives. When the incentive began, there was a five per cent increase in the number of screens, but this was not sustained throughout the periods analysed.

While two-thirds of Greene's (2013) longitudinal sample signed on to the incentives within the first full year of them becoming available, the majority made no incentive claims in the year, though a small subset made more than ten incentive claims. However, by 2008, 31 per cent of the sample of GPs claimed more than ten diabetes incentive payments. Over time, increases for cervical cancer incentives were modest and, whilst participation increased, the actual number of claims for asthma incentives decreased; it was not specified as to whether this was a significant decrease. GPs who actively participated in the incentive program in 2005 had much higher baseline levels of HbA1c testing, and they did not increase testing more than non-participating GPs. This suggests that GPs who were already providing high quality care signed on to the program, but did not show improvement, whereas those that may need to improve did not sign on. However, neither signing on to the incentive program nor the number of incentive payments claimed by a GP in a year was significantly associated with the number of diabetes tests or cervical cancer screens provided. For the diabetes incentive, GPs were quick to sign on, but uptake of claiming was more gradual. By 2009, 31 per cent of GPs claimed more than ten incentive payments, up from 14 per cent in 2002.

The qualitative analysis revealed GPs who claimed the P4P did not believe the incentives influenced the way they treated patients. However, several challenges and enablers emerged from the qualitative data. The diabetes cycle of care was spoken about favourably and the list of behaviours based on this tool had helped GPs self-audit regardless of whether they submitted a claim. In contrast, participants acknowledged the burden of tracking patients, complexity of billing and the relatively modest incentive payment as barriers to uptake and meaningful use of these incentives. Additionally, few GPs had nurses available to assist them with tracking cycles of care. Separate billing codes for payments, and the lack of automated system was a further source of frustration. An integrated system that worked with EHRs was recommended (Greene, 2013).

Challenges of the Australian approach

Although there was no measurement of patient-centred experience or health outcomes, much of the criticism of the available research is based on the limitations of the data used. Greene (2013) identified that the asthma cycle of care does not include any procedures that are billed separately, thereby limiting the ability to track changes in asthma quality of care. This is a major limitation in using Medicare data as a measure for quality of care. However, a more serious flaw identified by Bayram and colleagues (2013) is that Medicare claims data do not accurately represent the pathology tests ordered by GPs. Since there is not a Medicare number for each test ordered by GPs, tests are grouped by pathologists for claiming purposes into their appropriate Medicare test item (Bayram et al., 2013). HbA1c and microalbumin have item numbers and, theoretically, there should be a Medicare claim for each test ordered. However, the Medicare funding system incorporates an 'episode cone' whereby payments to pathologists for Medicare testing are limited to the three most expensive items. Any remaining tests are coned out, and research by the Australian Association of Pathology identified that between 39 to 64 per cent of HbA1c and 11 to 22 percent of microalbumin tests were coned out. Thus the Medicare data under-represent actual billing for these types of tests, resulting in insufficient granularity of data for actual services rendered. Bayram and colleagues' (2013) data suggest that there has actually been a steady increase in GPs ordering HbA1c and microalbumin for the management of diabetes since the implementation of the P4P diabetes incentive. The authors reiterate the need for researchers to be aware of the limitations of administrative data systems, such as Medicare claims, before using the data as a measure of the effectiveness of a Government intervention.

PIP payments originally represented a significant share of practice income but this has decreased significantly and in 2008-09, it was only 5.5 per cent (Willcox et al., 2011). In some cases, PIP alone may not always be the most suitable means for delivering an incentive that is applicable to the entire general practice community. For example, accreditation, the entry requirement to receive PIP incentives, can be a significant barrier to certain general practices including Aboriginal Medical Services and smaller practices servicing remote locations and non-English speaking communities which have been underrepresented in PIP (Australian National Audit Office, 2010). The cost and work effort needed for accreditation are regarded by over 80 per cent of the Audit Office survey respondents as 'high' or 'very high' (Australian National Audit Office, 2010).

The level of PIP payment is adjusted using the standardised whole patient equivalent (SWPE) to account for practices' patient load¹ and location using the Rural, Remote and Metropolitan Areas (RRMA) classification (Australian National Audit Office, 2010). These adjustments can have

¹ Patient load is the proportion of care a practice provides to each patient using the value of the patient's MBS fees and then weighted using an age-sex factor.

unintended consequences for some practices, distorting uptake or incentives, thereby not achieving the intended outcome. For example, the SWPE was designed to reward practices that spent more time with individual patients; whereas, in effect, it provides greater payments to practices that have higher numbers of patient visits as opposed to fewer, longer consultations. The other central factor in determining PIP payments, RRMA, is based on outdated 1991 Australian Bureau of Statistics census data and is not used consistently by the Department of Health. In addition, a district can be assigned different RRMA categories under different programs.

Strengths of the Australian approach

The PIP is considered a well-established part of payment arrangements for quality in general practice. It was estimated in 2007-08 that the proportion of practices participating in the PIP was around 67 per cent (equivalent to all accredited practices) (Willcox et al., 2011) providing nearly 82 per cent of general practice care in Australia (Australian National Audit Office, 2014). Participating practices believe that the PIP has contributed to quality care and improved access, as has been supported by evidence in recent reviews (Greene, 2013).

United Kingdom

Quality improvement approach

Over the last 15 years, the UK National Health Service (NHS) has undergone a series of reforms aimed at quality improvement, particularly around chronic conditions. This led to the creation of the National Institute for Health and Clinical Excellence and the introduction of National Service Frameworks which set minimum standards for the delivery of health services in specified clinical areas. Introduced in 2004, the UK's Quality and Outcomes Framework (QOF) is much broader than the Australian PIP in terms of breadth of domains included in its payment framework and the magnitude of its potential payments. The QOF has been described as “more than a payment scheme” (Gillam et al., 2012, p 461) as it consists of a number of elements including financial incentives and information technology (computerised prompts and decision support), designed to promote structured and team-based care. It is a complex intervention with the aim of achieving evidence-based quality targets. (Siriwardena, 2010). Currently, there are 131 indicators relevant to quality of care. Payments through the QOF can constitute as much as one-third of a practice's income. The QOF was introduced with the intention to improve GPs' pay, conditions and satisfaction.

Incentive schemes for quality improvement

The UK QOF is one of the most comprehensive and well-studied approaches to quality improvement and financial incentives for GPs. Introduced in 2004, this payment-for-quality scheme is the system for the performance management and payment of GPs in England, Wales, Scotland and Northern Ireland. The QOF system is supervised and audited by Clinical Commissioning Groups in England and the analogous PHC organisations elsewhere in the UK, which make the related payments (National Health Service, 2013b). In 2004, new contractual arrangements for family doctors in the UK allowed them to opt out of out-of-hours care and linked financial incentives to quality of care under the QOF. This model is considered the largest and most ambitious P4P scheme ever attempted in health care (Kontopantelis et al., 2013). The framework comprises 76 clinical indicators and 70 indicators pertaining to practice organisation and patient experience. Eighteen of the clinical indicators pertain to care for patients with diabetes. Other payment approaches in the UK include Payment by Results, which is more suited to instances where technical efficiency is the focus (i.e. hospital services) (Appleby et al., 2012). Commissioning for Outcomes-Based incentivised contracts (COBIC) is another approach in which contracting replaces a variety of fragmented, individually negotiated contracts with a single integrated tender, forcing providers to respond differently to target specific populations. One such example is the substance misuse case study in Milton Keynes (Corrigan and Hicks, 2011).

In addition to the QOF, the NHS has also commissioned new Enhanced Services as a financial lever which focuses on quality improvement (National Health Service, 2013a). These include guidance and audit for alcohol-related risk, learning disabilities, immunisations, dementia screening, patient access to online resources, remote care monitoring, preparation and support. This lever has three categories: Direct Enhanced Service (DES); National Enhanced Services (NES); and Locally Enhanced Services (LES). A number of NES/DES can be considered as service specifications, but also quality improvement. LES are locally commissioned depending on the Primary Health Care Organisation's priorities. The establishment of LES was recommended to improve care for specific diseases. For example, enhanced services for diabetes could offer a framework within a practice for appropriate patients to support self-management and prevent diabetes complications. This includes the appropriate use of community diabetes teams and secondary care according to the Clinical Commissioning Group's guidelines and agreed secondary care referral criteria.

Evidence of effectiveness

A recent systematic review (Gillam et al., 2012) of P4P across the UK regions reviewed 94 studies on the dimensions of effectiveness, efficiency, equity and patient experience, in line with the Institute of Medicine's definition of quality of care (Institute of Medicine, 2001). Similar to international findings by Scott et al. (2011), there were conflicting findings across a large and diverse body of research. However, some consistent themes emerged. QOF has assisted in consolidating evidence-based methods. It has been associated with an increased rate of improvement of the quality of care in the first year of implementation, returning to pre-intervention rates of improvement in subsequent years; modest reductions in mortality and hospital admissions in some areas, and where assessed, these modest improvements appear cost effective; and it has led to narrowing of differences in performance based on deprivation index and strengthened team work (Gillam et al., 2012).

In a high quality interrupted time series study from Kontopantelis et al. (2013), data were derived from individual patients registered within a nationally representative sample ($N=148$) of practices between 2000 and 2007. Patient-level data from over 23 000 patients with diabetes were extracted using the General Practice Research Database. The specific focus of this study was to investigate quality and outcomes of diabetes care associated with 17 incentivised diabetes quality indicators pre- and post-implementation. Information about age, gender, length of diagnosis, co-morbid conditions and deprivation at the practice level (Index of Multiple Deprivation) were extracted to explore their influence on the use of the incentive scheme. In addition, a composite quality of care score was calculated for each patient at each time point; and the number of indicators achieved for that patient was calculated as a percentage of the number that applied to that patient. These scores represent the degree to which each patient received the 'necessary care' for their diabetes, as set out by the QOF indicators. Results from this study showed that, in the first year of the QOF (2004-05), there was an improvement in composite recorded QOF care of 14.2 per cent. This was greater than expected based on trends in pre-intervention care. However, by the third year (2006-07) the difference was smaller, at 7.3 per cent.

The recorded quality of care across the practices increased for all individual indicators, with absolute improvements ranging from 4.2 per cent (control of HbA1c levels $\leq 10\%$) to 85.5 per cent (providing smoking cessation advice). The highest scores were observed for patients with three or more co-morbid conditions and patients aged over 65 years. Younger patients (aged 17-29 years), and newly diagnosed cases had the lowest level of recorded care. Kontopantelis et al. (2013) suggest this is due to a higher proportion of type 1 diabetes patients in the younger age groups for whom some quality targets are more difficult to achieve; although the authors do not explain why this may be the case. Women appear to have received slightly poorer QOF care both before and after the intervention. These findings reflect earlier research on P4P, patient characteristics and diabetes management (Hamilton et al., 2010). Recorded quality of diabetes care continuously improved over the period of the study, against a background of increasing disease prevalence. However, it was already improving prior to the introduction of the incentive scheme as measured by the QOF framework. The intervention varied with area deprivation, with patients attending practices in more deprived areas appearing to have gained the least from the intervention compared with patients in the most affluent quartiles (Kontopantelis et al., 2013).

The impact of LES on diabetes outcomes was examined using outcomes data for QOF for diabetes targets (blood pressure, lipids and glycaemia) and hospital attendance (Choudhury et al., 2013). Data from the Quality Management Analysis System was compared with data extracted from GP patient records (GPES) from 76 practices in the Birmingham region. Data pre- and post-LES were compared during two separate periods 2004-2005 and 2009-2010. For diabetes-related hospital attendance

there was a significant difference for LES practices with fewer patients requiring hospital visits for new or follow-up appointments for diabetic patients. There was no significant difference between blood pressure (BP) and lipid QOF targets in LES compared to non-LES practices. However, the probability of achieving satisfactory glycaemic control increased by almost ten per cent when GPs belonged to LES groups. These data were only across two time points so the trajectory of effectiveness is unknown. However, this study suggests that financial incentives paired with training through LES can improve P4P glycaemic targets but not BP or lipid targets.

Challenges of the UK approach

The QOF scheme is expensive, costing over £1 billion per year, with ten per cent allocated to diabetes care (Kontopantelis et al., 2013). A key criticism of the financial incentives is that practices faced very little real risk to their incomes because indicator targets were set at readily achievable levels (Willcox et al., 2011). This was reiterated by findings described above (Kontopantelis et al., 2013) that identified two factors contributing to the decreases in the second and third years of the incentive uptake. Firstly, benchmarking was poor and there was a ceiling effect, whereby some practices' achievement was close to 100 per cent on some indicators. In this context, significant improvements were impossible. Secondly, there was a payment threshold and, in the first year, most practices exceeded the level of achievement required to secure maximum remuneration, so there was limited financial incentive for further improvement. Target measures made allowances for 'exemptions' when patients failed to respond to calls or attend care clinics (Maynard, 2012). An additional explanation may be that the first year 'improvement' only reflected better recording and claiming, but not necessarily improved provision of care; and that this levelled out in the third year to a more regular rate of improvement. The costs of administering the scheme are substantial, and some staff have indicated concern at a shift toward a more biomedical focus and less patient-centred focus (Gillam et al., 2012).

Strengths of the UK approach

In regards to the strength of the data, the General Practice Research Database contains complete electronic records of patients attending primary care practices in the UK. In addition, practitioners used Read Codes, a hierarchical coding rule set, to enter data on their clinical computing systems. This potentially improved the quality of the data. Furthermore, practitioners were not limited to Read Codes in order to counteract possible underestimates of the true prevalence due to changes in coding behaviour following the introduction of the scheme and subsequent changes in QOF business rules (Kontopantelis et al., 2013). The QOF relied on a large investment in information technology (IT) which is likely to have contributed to the increase in recorded levels of care. The uniform investment in IT across the whole of primary care may not have taken place in the absence of the scheme. Kontopantelis et al. (2013) suggest that even if the IT investment existed beforehand, it is doubtful the GPs would have chosen to adapt to the new system altogether as they have, if not rewarded to do so.

The calculating quality reporting service (CQRS) replaced the manual systems for calculating and reporting quality outcomes for many general practice services. It has been suggested that the enhanced service approach is that practice achievement data can be obtained from general practice clinical systems via the General Practice Extraction Service (GPES). CQRS is more efficient and cost-effective as it automates the returns process, saving time and resources.

United States

Quality improvement approach

In the US, P4P is the principal approach to improving quality of care; in 2007, there were an estimated 256 different P4P programs across the country, most of which were operating in primary care settings (Eijkenaar, 2012). For example, almost half of the Health Maintenance Organizations distributed across the country use some form of P4P to incentivise practice among their physicians (Bishop et al., 2012) and a number of health plans have P4P incentives attached. Clinical quality is the aspect of care most commonly incentivised by these programs and process and structural measures are more common than outcome measures. Often US incentives target groups, with requirements that a minimum number of patients be attributed to an individual provider. Over 60 per cent of the programs only use bonuses, with ten to 20 per cent using withholding approaches. Despite an increase in ongoing payments (i.e. multiple payments as services are provided throughout the year), the majority of programs pay one annual payment for all services provided; and estimated average payment size is approximately seven per cent of total revenue for physicians. Fifty per cent of programs use relative targets though there are increasing numbers of programs focusing on absolute targets and performance (Eijkenaar, 2012). The other main incentive used to promote high quality care is public reporting of quality measures (Bishop et al., 2012). Public reporting refers to data being made publicly available about health care structures, processes and outcomes at individual or organisational levels, for the purpose of comparing data across providers or comparisons with national and regional level standards (Totten et al., 2012).

Incentive schemes for quality improvement

In 2007, the Physician Quality Reporting Initiative was introduced (now termed the Physician Quality Reporting System), a voluntary 'pay for reporting' model in which family physicians provide care to Medicare beneficiaries and report their performance on predefined quality measures (American Academy of Family Physicians, 2014). Physicians were entitled to a lump-sum incentive payment if they met the criteria for submitting quality data based on a list of 74 individual quality measures (American Association of Orthopaedic Surgeons, online). In 2010, the Affordable Care Act extended this model making quality reporting mandatory. Incentives are used to reward practices that meet criteria associated with better outcomes such as increased continuity of care or ease of access. Physicians are eligible for an incentive payment of one per cent of their Medicare Part B Physician Fee Schedule for successfully reporting Physician Quality Reporting System measures, of which there are currently 190 measures and 14 measure groups. There are additional opportunities for a further 0.5 per cent incentive if physicians participate in maintenance of certification programs (more often than is needed to maintain their board status) and complete qualified maintenance of certification program assessments. With both the Affordable Care Act and the more recent Patient-Centered Medical Home model (which adopts the same reporting model), compensation is designed to enable practitioners to demonstrate the quality of care they are providing (Bishop et al., 2012).

Examples of specific types of US financial incentives can be understood by examining EHRs. The 2009 Health Information Technology for Economic and Clinical Act saw the commitment of US\$27 billion over six years from the Government to incentivise EHRs across a range of health professionals in different settings (e.g. primary care, hospitals, school dental clinics) (Kalenderian et al., 2013). The 2009 American Recovery and Reinvestment Act also encouraged adoption of EHRs through incentives (Ryan et al., 2013); and Centers for Medicare and Medicaid Services (CMS) provide incentives for transition to, adoption of, and meaningful use of EHRs to improve patient care (CMS, 2012a, Jacob, 2013). More details on meaningful use of EHR technology in the US is provided in the Appendix (p 35). Table 3 (Appendix) illustrates examples of meaningful use of EHR technology to:

- improve quality, safety, efficiency and reduce health disparities
- engage individuals/families in health care
- improve coordination of care
- improve population and public health
- maintain privacy and security (CMS, 2014).

These incentives include not only a reward for switching to EHRs and meaningful use of EHRs, but also a deduction to payments if practices do not switch to the electronic systems.

Evidence of effectiveness

A quality improvement intervention study from New York recruited small primary care clinics to investigate the impact of P4P incentives using a good quality cluster-randomised trial (Bardach et al., 2013). Clinics were paid for each patient whose care met the performance criteria with higher payments received for patients who had comorbidities, Medicaid insurance, or were uninsured (maximum payments US\$200 per patient or US\$100 000 per clinic). Outcomes assessed included aspirin or antithrombotic prescription, BP control, cholesterol control, and smoking cessation. Clinics that received the intervention reported significant absolute improvements in rates of appropriate antithrombotic prescription, BP control, and smoking cessation. For example, 17.1 per cent of clinics administered smoking cessation interventions at baseline with a significant increase to 29.5 per cent providing this type of care after introducing the P4P incentives (compared to 19.1% to 26.8% for control clinics). In regards to cardiovascular care processes, this P4P incentive program was able to improve quality in comparison to usual care practices in small EHR-enabled clinics.

Also aiming to assess the impact of a P4P incentive, a quasi-experimental study from Washington investigated a P4P incentive as part of a population-focused, integrated care program for depressed adults in community health clinics (Unützer et al., 2012). The Mental Health Integration Program, provided in over 100 community health clinics and 30 community mental health centres, illustrated variable quality and outcomes across sites; thus the program sponsors introduced the P4P incentive to improve consistency. The nature of this incentive meant that a quarter of the annual program funding to individual clinics was contingent on meeting quality indicators, including timely follow-up with patients, psychiatric consultation for patients not showing clinical improvement, and tracking of medications. Regular feedback and assistance was provided to participants in relation to these quality indicators. Following the introduction of the P4P program, results indicated that patients were more likely to be offered psychiatric consultation if required, and more likely to experience improvements in depression severity, timely follow-up, and a reduction in time to improvement.

The EHR incentives were designed for providers to demonstrate that they are using EHRs to improve the care provided to their patients. According to the CMS, at November 2013, more than 334 000 health care providers had received payment for participating in the EHR incentive programs. The majority of the Medicare eligible professionals (EPs) in this group were doctors of medicine or osteopathy ($N=289\ 852$) and similarly it was physicians who represented the majority of the Medicaid EPs ($N=95\ 627$) (CMS, 2013c). Data illustrated that approximately 81 per cent of all EPs had registered to participate in the incentive programs (CMS, 2013b), with 54 per cent participating in the Medicare program and 27 per cent in the Medicaid program. Twenty per cent of Medicare EPs were based in family practice, and 71 per cent of Medicaid payments were received by physicians, with 17 per cent received by nurse practitioners. Approximately 64 per cent of all EPs received an incentive payment for meaningful use or adoption, implementation, or upgrade of EHRs. The most frequently achieved core objectives referred to provision of an electronic copy of health information and the active medication list (Table 4, Appendix). Data illustrated an increase in the percentage of EPs successfully performing core objectives over the period from 2011-2013. In relation to menu

objectives, clinical lab test results and transition of care summaries were the most successfully performed, with trends for improvements across most objectives over the three year period. This suggests that the incentives improved the use of EHRs and influenced the quality of care provided to patients.

Challenges of the US approach

There are challenges in applying P4P in low SES areas or with vulnerable populations (Chien et al., 2012). In these areas and for some other practices, quality targets may be perceived as unattainable. In addition, the practices may not have the resources or infrastructure to identify or follow-up patients. One recent study (Dowd et al., 2013) investigated the effect of a health plan's P4P scheme on prescription rates. The incentive was based on the performance of participating physician practices in an entire established network but the network implemented rewards at the practice level on an all-or-nothing basis (i.e. if the prescription targets were met). The authors described how this was a strong incentive for individual practices but also noted that, when incentives are for absolute improvement, those practices performing well under the target may give up and inadvertently prevent the network from being rewarded.

Challenges relate to both patient adherence and physician perceptions (Chien et al., 2012). It has been proposed that incentives may not be accepted if they are not sufficient to significantly affect physician incomes or patients' quality perceptions and that some physicians may not agree with the indicators selected to measure quality (Bishop et al., 2012). Subsequently, the incentive amount and support available may not be sufficient to induce desired physician behavioural changes in some cases (Chien et al., 2012). Additional challenges to quality improvement data relate to the population size. That is, it is hard to measure improvement if the incentive relates to a disease or condition for which the sample of eligible visits is too small (e.g. in rural/remote areas).

Strengths of the US approach

Some of the benefits of the US approach to quality improvement include the widespread uptake of initiatives. Public reporting on quality of care is mandated and linked to financial incentives. P4P incentives are frequently implemented across the country and act to improve consistency of practice and encourage high quality care provision for patients. In many cases, the emphasis is on awarding bonuses rather than withholding payments which acts to engage physicians in making positive behaviour changes.

Canada

Quality improvement approach

The 2004-2014 10 Year Plan to Strengthen Health Care from the Canadian Federal Government has allocated funds “to support innovation and stimulate system-wide improvements in quality” (The Commonwealth Fund, 2012, p 22) around aspects of care such as wait times, health technologies and patient safety. The Health Council of Canada is responsible for monitoring progress in improving the quality of the health system, however, as many quality improvement initiatives occur at the provincial and territorial levels they are also monitored at a local level by councils specifically established to conduct public reporting on health system performance. Financial incentives have been introduced to support after-hours care and encourage participation in multi-professional practices (The Commonwealth Fund, 2012).

Incentive schemes for quality improvement

Ontario originally introduced P4P incentives in 1999 to address preventive care and services provided by family physicians, with further expansion to the incentives in the Physician Services Agreement of 2004 (Hurley et al., 2011). Performance incentives were available to a subset of physicians, those working in Ontario’s primary care reform practices. The incentives specify a target population, time period and threshold coverage levels. In 2006, British Columbia and Manitoba introduced P4P approaches termed the Full Service Family Practice Incentive Program and the Quality Based Incentive Funding Program, respectively (Hurley et al., 2011). The former involves initiatives which address financial incentives relating to high quality management of congestive heart failure, diabetes and hypertension; obstetric and maternity care; reviews of patients in care facilities; community-based patient care; patients with comorbidities; cardiovascular risk assessment; group practices; mental health care; palliative care; acute care discharge to community care; and chronic obstructive pulmonary disease (British Columbia Ministry of Health, n.d.). The latter, the Quality Based Incentive Funding Program, is a blended physician compensation approach which considers the quality of services provided using P4P and the volume of services provided by the FFS clinics participating in the Manitoba Physician Integrated Network; and rewards process rather than outcomes (Manitoba Health, n.d.). In 2009, Alberta developed the Performance and Diligence Indicators Program which ran from 2010-2011 and was designed to reward individual family physicians who met “specific performance and/or diligence indicators that deliver substantive clinical value” (p 3). The first phase involved the development of validated lists of patients for whom the physician was actively serving as their most responsible primary care physician. Physicians were compensated after both physician validation of the list (\$3.50 per patient) and patient validation of patient-physician relationship (an additional \$3.50 per patient) (Government of Alberta, 2010). The second phase aimed to address performance indicators but was not implemented (Primary Care Initiative, 2013).

Evidence of effectiveness

The Centre for Health Economics and Policy Analysis in Ontario undertook an evaluation of the effect of performance incentives on service provision using a pre-/post-design with data from 1998-99 and 2007-8 (Hurley et al., 2011). Measures addressed incentives for 11 services: senior flu shots, toddler immunisations; cervical, breast and colorectal cancer screening (preventive services); obstetric, hospital and palliative care services; office procedures; prenatal care; and home visits (annual special payments for physician services). Preventive services payments include two parts that reward practices for: first, contacting patients and scheduling appointments for preventive services (\$6.86 contact payment for each eligible patient); and second, achieving high rates of coverage for the service in the target populations (cumulative preventive care bonus payment – practice rewarded when one physician achieves specified levels of coverage, amount relates to service coverage and

depends on type of practice as to whether funds go directly to physician or stay with practice). Special payments for physician services are bonuses paid to physicians, based on whether they reach a minimum absolute level of service provision where the minimum is defined in terms of number of services, dollar value of services, number of patients or a combination, and there is a single threshold level. The evaluation also assessed whether provision of 57 services, funded by capitation payment, changed over time among family physicians enrolled in Family Health Networks. Participating physicians were from different primary care reform practice types (Table 5, Appendix) including Family Health Networks, Family Health Groups, Comprehensive Care Models and Family Health Organizations and were compared with ineligible family physicians (i.e. those not working in primary care reform practices) who had traditional FFS practices. In developing the data, “the measure of utilization for each of the preventive care bonuses was the proportion of a physician’s eligible patients who had received the preventive service during the relevant time period... the measure of utilization for the special payments was an indicator of whether a physician’s pattern of service provision exceeded the level required to qualify for the special payment” (p v).

Results from Hurley et al.’s (2011) evaluation illustrated that the provision of incentives increased the provision of all of senior flu shots (5.1%), pap smears (7.0%), mammograms (2.8%) and colorectal cancer screening (56.7%). Trends suggested that while practice size had little impact, there was a greater response among younger physicians and those who recorded lower baseline levels of provision. There were no significant improvements in the physician services based on incentives (special payments). There were also no differences in the provision of services when comparing those funded by capitation and those not funded by capitation. The authors describe how the preventive services measured are acknowledged to represent high quality care while the incentivised physician services were linked to professional practice more so than quality.

A further study from Ontario assessed the influence of a diabetes incentive code for primary care physicians (Kiran et al., 2012). One quarter of Ontarians with diabetes had an incentive code billed by their physicians and the longitudinal results found that introduction of the incentive led to minimal improvement in quality of care at both the patient and population levels. The findings illustrated that those physicians who had been providing the highest quality care before the incentives were introduced were those most likely to claim incentive payments and that physicians working in practices reimbursed by blended capitation were 25 per cent more likely to bill an incentive than physicians working within a FFS practice.

Research from Alberta explored quality improvement interventions for increasing the rates of vaccinations among community-dwelling adults (Lau et al., 2012). The study explored a range of interventions including audit and feedback, case management, clinician education and reminders, financial incentives, patient outreach and team changes. Results illustrated that both patient (i.e. eliminating out-of-pocket costs) and clinician financial incentives were effective for significantly increasing influenza vaccinations.

Challenges of the Canadian approach

Low uptake of an incentive may relate to its economic value, physicians’ awareness of the incentive’s availability, administrative burden and resources available to support incentive roll out (Kiran et al., 2012). Perceptions of incentivised physician services in Ontario did not relate to quality and often the incentivised actions required additional infrastructure or equipment, hence potentially limiting uptake (Hurley et al., 2011). This reflects a situation where much of Canada continues to rely on FFS payment methods (Hutchison et al., 2011).

Strengths of the Canadian approach

Preventive services in the Ontario study were activities commonly conducted by physicians and required no additional equipment or resources (Hurley et al., 2011). In many cases, they were complementary to other services. For example, the authors of the evaluation described how the software for many EHR systems being adopted by physicians enabled automatic reminders for preventive services. Further, these preventive services incentives also included two parts: contacting patients and outcomes – perhaps this encourages practice teamwork and allows the targets to be reached more effectively.

New Zealand

Quality improvement approach

The NZ Government has been attempting to improve quality in the health care system since 2003 (Gauld et al., 2012). Prior to 2010, the Quality Improvement Committee (QIC) oversaw quality improvement initiatives in NZ, including a series of pilot quality improvement projects in public hospitals. In 2010, the QIC was replaced by the Health Quality and Safety Commission, a stand-alone Crown agent, which was established to lead a national quality program including development of a set of national indicators for hospitals (Gauld et al., 2012).

However, there is little mention of primary care's role in quality improvement initiatives and a number of challenges have been identified. According to Gauld et al. (2012), quality improvement initiatives have been "piecemeal and insufficient", and "mostly left to individual hospitals and districts, with little national coordination" (p 829). While GPs have been using EHRs and other IT applications (electronic prescriptions, test ordering) since the 1990s, Gauld et al.'s report suggests that there has been an overall lack of leadership or coordination at the level of government; and limited interoperability between hospitals and the primary care sector. The National Health IT Board, which was established in 2009, aims to develop national solutions to some of the IT problems and facilitate shared EHRs in 2014.

Incentive schemes for quality improvement

While capitation funding is widespread in NZ, additional funds are available for chronic disease management, strategies to improve patient access and health promotion. However, these bonuses are paid to primary health organisations (PHOs) rather than practices or GPs (Gauld et al., 2012), and provide only a small proportion of PHOs' income (Buetow, 2008). The Primary Health Organisation Performance Management Programme (PHOPMP), also known as the PHO Performance Programme, which commenced on 1 January 2006, is a joint initiative between district health boards (DHBs) and the Ministry of Health (Buetow, 2008, DHB Shared Services, 2006). This programme aims to encourage and reward performance by PHOs in line with evidence-based guidelines, and measure and reward progress in reducing health inequalities by including a focus on high needs populations. Performance indicators are specific to the locality, but target 'high needs' patients with poorer health. In addition to PHO review and feedback and expenditure benchmarks, P4P against performance indicators are a core component of the program and are underpinned by the principles of quality, equity and affordability (Buetow, 2008).

The NZ Government is currently considering a new performance framework for the health care system. In late 2013, the Health Improvement & Innovation Research Centre (HIIRC) circulated a draft framework, the Integrated Performance and Incentive Framework: Achieving the Best Health Care Performance for New Zealand (HIIRC, 2013) which proposes that primarily non-financial incentives will be used.

The proposed framework would not rely upon direct financial incentives for performance improvement... Limited direct funding available for incentives, that will be spent so as to get a balance between capacity building and incentives for results. Incentive funding will generally cascade down to the front line service providers. (HIIRC, 2013, p 4).

The non-financial incentives that have been proposed are:

- **Influence:** within district alliances, high performing primary care organisations will have the opportunity to influence decisions pertaining to the use of resources

- **Freedom to exercise professional judgement:** using a “tight-loose-tight approach”, and within nationally determined performance indicators, high performing organisations will have greater autonomy and professional freedom to determine priorities and performance measures
- **Supporting strong clinical governance:** within district health systems, performance improvement resources may be used in clinical governance to strengthen clinical practice (HIIRC, 2013, pp 4-5).

Evidence of effectiveness

Little evidence of effectiveness of existing financial incentives for quality improvement in primary care was located in the available literature.

An evaluation of the PHOPMP began in 2006 (Buetow, 2008) and findings of a survey of managers of the first 29 participating PHOs were positive:

All stated that, as a result of the PHO performance management programme, their PHO had developed an increased focus on quality improvement, including clinical facilitation; data collection, data quality and feedback to member practitioners; and clinical governance groups (Buetow, 2008, p 42).

Investigating quality activities undertaken by general practices, Perera et al. (2013) found that 72.9 per cent of practices that had undertaken quality activity in the previous two years (prior to mid-late 2009) had participated in the PHOPMP some of the time, and 14.8 per cent most of the time (Perera et al., 2013). Perera et al. (2013) found that financial incentives would motivate increased primary care professionals’ activity in more than 40 per cent of respondents (response rate in this study was very low).

Performance results for the Te Tai Tokerau region on the PHO Performance Programme were published in June 2013, suggesting despite lack of peer-reviewed publications that the programme is still underway in some regions. Indicators included in this report included breast and cervical cancer screening, ischaemic cardiovascular disease detection, cardiovascular disease risk assessment, diabetes detection, diabetes follow-up after detection, vaccination coverage (3 indicators), smoking status and smoking brief advice and cessation support. The report identifies the PHOs’ performance in the context of DHB and national performance. Payments are made every six months for most indicators. Payments for the majority of indicators are made on the basis of percentage attainment of the target. The maximum available payment is NZ\$6 (GST inclusive) per enrolled member, if all targets are achieved. However, this report does not specify payments received by this PHO. In addition, the PHO Performance Programme guideline specifies that PHOs are eligible to receive payments as they improve their performance on indicators against targets. For the majority of indicators, the closer the PHO moves towards its target, the greater the proportion of the payment received. Some indicators are provided for information only.

Challenges of the NZ approach

This review has highlighted that one of the biggest challenges facing quality improvement and financial incentive approaches in NZ is the lack of evaluation literature. The one quality improvement program with financial incentives identified in the literature search has limited evidence which was published in 2008. In a series of interviews and surveys, Perera et al. (2013) reported that primary care professionals often perceive quality improvement activities as being of little relevance to day-to-day clinical care. In light of this, Buetow (2008) and colleagues highlight challenges across the world around financially incentivising quality improvement and identified a number of challenges and criticisms specific to the PHOPMP, including:

- small size of the monetary compensation may be “ineffective as an extrinsic motivator and reward for achievement and improvement” (p 42)
- financial incentives ignore intrinsic motivators, such as pride and professional competence and autonomy
- bonuses are paid to PHOs to improve services, rather than supplement providers’ incomes, yet it is the provider’s responsibility to deliver the quality care
- the PHOPMP focuses on high needs populations and scarce public resources may be diverted away from other priority health care issues
- considerable lack of transparency, clarity and guidance about how PHOs may use performance payments, which is linked to a perception of unfairness pertaining to the approval process.

Strengths of the NZ approach

There are performance results published for PHOs on PHOPMP indicators allowing for comparison across local, regional and national populations with high needs. However, there is no formal evaluation of the program as a whole.

Summary

Evidence from a systematic literature review (Scott et al., 2011) indicated that different financial incentive interventions show modest and variable effects on the quality of health care provided by GPs. More recently, evidence suggests that P4P programs have limited impact on quality improvement (Kontopantelis et al., 2013).

It is important to acknowledge the five key points that are relevant to financial incentives (Appleby et al., 2012):

- 1 Payment systems cannot do everything: they should be evaluated together with other policy levers for quality improvement; or in terms of their additional impact, controlling for the effect of other approaches
- 2 One size does not fit all: different payment systems may be needed for different types of services, depending on whether more or less activity is desirable; and whether there is capacity to meet varying levels of demand
- 3 Payment systems need to be flexible: changing objectives, different contexts and the experience of impact may require adjustments to a payment system
- 4 Trade-offs between objectives is inevitable: potential conflicts may arise between cost and quality or supply maintenance, particularly where the quality of services for the cost is not sustainable or where the number of objectives increases
- 5 Data and research for payment systems must be strengthened: high quality data and analysis is needed to inform the structure of payment systems and avoid unintended effects.

Challenges

Who gets paid?

Ultimately the system of financial incentives associated with the quality of care that professionals are expected to provide affects how these professionals feel and behave. Two main problems associated with who receives a financial incentive were identified in the literature: one relates to the target for change; and the other relates to performance evaluation.

- 1 There is a consistent lack of information about distribution of payments; and in the available information, there is a range of different systems with some incentives directed at groups or organisations and others directed at individuals. This is a key consideration in designing future programs. Given that team-based care is a central part of PHC, it is important to determine whether it is best to reward the primary outcome measure based solely on the behaviour of one physician or whether it is possible to take into account the likelihood that tasks may be delegated to others (e.g. practice, nurse, practice managers etc.) (Scott et al., 2011).
- 2 Evaluating the effectiveness of incentives is difficult when the unit of analysis for quality improvement differs. In some studies, it is an individual physician, and others refer to a practice or an episode of care. Further, in some cases where there has been national roll out of incentives, such as in the UK, it is hard to determine the impact of the incentive as there is no concurrent control group for comparison purposes (Hurley et al., 2011).

How much is enough?

The strength of financial incentives is often not well reported (i.e. what proportion of annual revenue is delivered by incentives) (Scott et al., 2011). Internationally, the proportion of providers' income that is derived from incentives varies substantially. For example, in the US incentives may contribute seven per cent of total revenue while under the QOF in the UK payments can contribute up to 30 per cent (Eijkenaar, 2012). If the incentive is too low, it is unlikely to motivate behaviour change and/or

the administrative burden related to claiming a minimal reward may not be worthwhile. Incentives are not accepted if they are perceived as insufficient to affect physician income; fail to influence patients' quality perceptions; or offer inadequate measures of quality in the physicians' view. If the incentive is too high, the costs to the health system increase and perverse incentives may prevail. In addition, reports on the degree of attachment between patient and GP are often lacking. That is, if a patient visits multiple health professionals, then effect sizes in measures of outcomes representing quality improvement may be partially attributable to other physicians, yet the reward is attached to only one practice (Rosenthal et al., 2006). Further, data often reflect the effect of an incentive on the provision of services, yet it is rarely translated to consider the impact on health outcomes at patient and population levels (Hurley et al., 2011).

What are the unintended consequences?

In their systematic review, Scott et al. (2011) reported that the unintended consequences of incentives are rarely examined. These consequences include:

- perverse behaviours such as crowding in/out, exception rates, and gaming, where practices exaggerate performance or maximise exemption quotas (Maynard, 2012) in relation to incentives; or worse, coercive behaviour by GPs towards patients considered as non-compliant (Gillam et al., 2012)
- diverting attention from aspects of care not targeted by incentives
- causing conflict within workplaces by directing incentives at GPs and overlooking the notion that whole practice teams may have helped support patients and practitioners (Hurley et al., 2011, Scott et al., 2011).

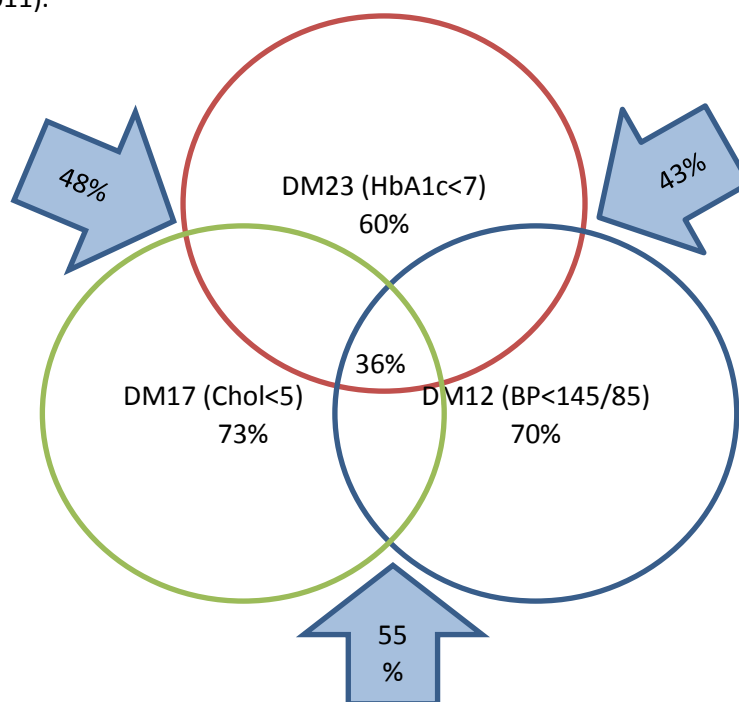
Incentives targeted without consideration for the context may in fact be a disincentive. For example, in small practices, or in rural/remote areas, where staffing and resources are minimal, the incentive targets may be too difficult to achieve and the administrative burden of making claims for funds may be a disincentive (Australian National Audit Office, 2010). Similarly, financial incentives in the UK showed the least advantage in areas of greatest deprivation compared to the more affluent quartiles (Kontopantelis et al., 2013). Little response can be expected if the target is perceived unattainable or if the target is already attained - this is known as the goal-gradient hypothesis (Heath et al., 1999).

Developing an evidence-base?

P4P is dominating policy agendas worldwide. The evidence of effectiveness of financial incentives to inform the implementation of payment systems are often poorly designed, implemented and evaluated (Maynard, 2012). As a result, there are shortcomings in the available literature that increase the potential for bias and reduce the likelihood that similar results would be replicated (Scott et al., 2011). There are several limitations to the evidence available on quality improvement and financial incentives:

- **strong theory** is needed to underpin examination of both intended and unintended consequences (e.g. motivation theory, cognitive psychology).
- **study design** needs improvement: in particular, there is currently limited external validity, inadequate blinding, and potential bias in selection of participants (towards those that perform well), financial interventions to reward performance are often implemented universally, as part of policy reform, therefore there is no control group for comparison. When a program is applied uniformly to a large number of providers, absolute targets may not be efficient because payments are made for performance already being delivered.
- **meaningful measures of quality** are needed to ensure the indicator or outcomes rewarded. Recorded quality of care does not necessarily mean actual improvement in the quality of care experienced by a patient. Incentivised measures of performance are not necessarily ones that

patients value or would be willing to pay for. Quality indicators that are “selected for their ease and cost of measurement” may discourage innovation in quality improvement (Buetow, 2008). To remedy this, a broad range of outcomes (structural, process, outcome) and validated measures need to be utilised. This may relate to batching or grouping clinical indicators in a meaningful way; understanding normal variation in data; using benchmarking; providing resources and infrastructure to enable accurate and consistent reporting of data by practices; or verifying reports by using prevalence trends reported in previous studies (Coombs et al., 2011, Dawda et al., 2010, Kontopantelis et al., 2013). For example, Figure 1 illustrates the bundle approach to performance data for type 2 diabetes care. Instead of using multiple single measures, which range from 60 per cent (for HbA1c) to 73 per cent for cholesterol, a set of related measures are bundled to drive improvement in the quality of care for a condition. In this case, 36 per cent of patients receive three QOF items (Dawda et al., 2010). Further, unintended consequences of incentives for quality improvement should be measured (Scott et al., 2011).



Source: (Dawda et al., 2010). DM=Diabetes Mellitus; BP=blood pressure; Chol=cholesterol
Figure 1 Use of the bundle approach for measure performance in diabetes care

- **Use of data** to influence successful quality improvement in the future. For example, benchmarking against predetermined standards is the most common means of providing feedback for general practices about their quality of care. However, it is difficult to draw inferences about inter-practice differences without controlling for potentially confounding factors that exert a strong influence on a wide range of process and outcome indicators (e.g. age, deprivation index, disease prevalence) (Coombs et al., 2011). The clarity of data must also be considered. For example, many studies fail to distinguish between types of diabetes incentivised (Greene, 2013, Kontopantelis et al., 2013). It is possible that type 1 diabetes may be managed by specialists, whereas type 2 diabetes may be the domain of PHC practitioners. Thus, where it may seem that GPs are not performing the desired incentivised behaviours for diabetes care, it may be that the specialist has already ordered the required tests; and future research should highlight these differences in practices for different conditions. In addition, while substantial literature and data are available on diabetes, future directions should examine different conditions and incentivised health concerns.
- **Improved reporting** of interventions is needed, including details of the type of payment scheme used (baseline and control), use and distribution of payments; size of payments as a proportion of total revenue and relative costs and cost-effectiveness of financial incentives compared to other behaviour change strategies to improve quality.

Absolute versus relative improvement?

In this review, an important finding was that the literature pertaining to quality improvement and financial incentive initiatives rarely identified whether they were reporting absolute or relative improvement in quality of care measures. To reiterate, improvements in quality of care (i.e. patient care, drug effectiveness, patient status and other key metrics) can be measured in relative or absolute terms. *Absolute improvement* is defined as the change in performance from baseline to follow-up; *relative improvement* is defined as the absolute improvement divided by the difference between the baseline performance and perfect performance (100%) (Jencks et al., 2003). This distinction is crucial as, in some cases, absolute and relative measures may diverge with respect to the magnitude or direction of change leading to fundamentally different conclusions. Methodological overviews of measuring and monitoring health inequalities recommend reporting both absolute and relative measures whenever possible (King et al., 2012). The manner of presentation of results can influence PHC stakeholders' decisions about incentives.

Benchmarking or setting performance outcomes also has absolute and relative considerations. Some of the UK QOF indicators showed a large ceiling effect, whereby practices were already achieving very high levels; thus further improvement was unlikely (Kontopantelis et al., 2013). However, the worst performers at baseline had the potential to gain greater rewards. Internationally, the highest performing practices often illustrated the greatest uptake of incentives, rather than those whose performance would have benefited most from improvements in quality. Eijkenaar (2012) reported that absolute targets are likely to be more effective than relative targets because they are transparent and create less uncertainty regarding the efforts required to become eligible for payment. Relative targets may reduce collaboration and dissemination of best practices because they encourage competition. Adopting a tiered series of targets or differentiating targets based on baseline performance (with payment size conditional on level of attainment) could resolve this issue. "Piece-rate" payment approaches for each appropriately managed patient were also suggested (Chien et al., 2010).

Conclusions

Any evaluation of financial incentives associated with quality improvement must balance a nuanced assessment of health outcomes and other gains against costs. These are often difficult to describe, let alone quantify. The current review is consistent with these findings, showing mixed results in relation to the benefits of P4P and financial incentives on practitioner behaviours, and identifying a number of challenges to both implementing and measuring quality improvement in PHC.

Future directions

A number of potential strategies, funding models and incentives for quality improvement in PHC have been identified, including:

- Considering the benefit of enrolled populations
- Leveraging GPs' competitive nature by introducing reports on clinics' and colleagues' performances
- Encouraging multilayered approaches to improving the quality of care (local, regional and national)
- Developing regulations and new governance strategies
- Performance targets aligned with professional standards
- Making quality improvement implicit to the culture of organisations
- Conducting educational and public information campaigns
- Introducing non-financial incentives
- Focusing on professional norms and behaviours
- Changing roles in the health workforce
- Strengthening consumer engagement and participation in this age of patient-centred practices (Greene, 2013, Willcox et al., 2011).

Different examples from across the globe have illustrated mixed levels of improvement following the introduction of incentives. Moreover, individuals who are rewarded tend to be those who are already offering high quality care prior to the incentives being implemented (Rosenthal et al., 2005). Future programs may need to focus on practices that are not providing high quality baseline care and specifically target their processes. Further, lessons may be gleaned from hospitals, many of which also use P4P to drive change and focus on quality improvement in their processes. For example, in the US, changing the Medicare and Premier Inc. Hospital Quality Incentive Demonstration from rewarding only high performance to rewarding high performance, moderate performance and improvement "reduced the disparity in the receipt of any incentive payment and for incentive payments per discharge between hospitals caring for the most and least socioeconomically disadvantaged patient populations" (Ryan et al., 2012, p 1419).

P4P programs should be as automated as possible to ensure that claiming the payment is not burdensome, which may deter participation (Greene, 2013). In addition, incentives' absolute size and relative size need to be sufficiently large to motivate GPs to change their behaviours, but not so large as to compromise the budget on rewarding behaviour that is achieved with minimal effort. With evidence that positive reinforcement has more lasting effects than punishment, further examination of the impact of withholding funds versus rewarding behaviours should be considered. There also needs to be greater consistency in rewarding either practices or practitioners. With the shift towards multidisciplinary teamwork and integrated care, it seems that directing incentives at groups may represent a key direction for the future. However, if the focus remains on individual practitioners, while there needs to be investment in structures and processes to support quality improvement, the drive for quality improvement should tap into intrinsic motivation rather than extrinsic motivation;

and future interventions could target the cognitions of individuals in PHC (Dawda, personal communication, 2013).

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Appendices

United States

US Centers for Medicare and Medicaid Services EHR Incentive Program

The information below relates to details around meaningful use of EHR technology for eligible professionals (EP); requirements differ for eligible hospitals/critical access hospitals (CMS, 2010).

There are three components of 'meaningful use':

1. Use of EHR in a meaningful manner (e.g. e-prescribing)
 2. Use of EHR technology for electronic exchange of health information to improve quality of care
 3. Use of EHR technology to submit measures including clinical quality measures and the like.
- **Stage 1** – to qualify for an incentive payment, 20 of the 24 objectives (see Table 1 below) must be met (i.e. 15 core set, 5 menu set) in a 90 day period in the first (calendar) year of meaningful use and in a full year in the second year of meaningful use. To meet certain objectives 80 per cent of patients must have records in the certified EHR technology. Five of 10 menu objectives may be deferred.
 - **Stage 2** – to qualify, 17 core objectives and 3 menu objectives must be met (see Table 1 below). Requirements must be met for two full years.
 - In Stage 1 eligible professionals must also report on 6 total clinical quality measures (CQMs, see Table 2) (3 required core measures or 3 alternate core measures) and 3 additional measures (selected from a set of 38 clinical quality measures). For Stage 2 in 2014 it will be 9 of 64 CQMs (measures unavailable at time of writing).

Two types of percentage-based measures are used in demonstrating meaningful use:

1. Denominator is all patients seen during the EHR reporting period (regardless of whether their records are kept using EHR technology)
2. Denominator is actions or subsets of patients seen during the reporting period (only includes patients or actions taken on behalf of those patients, whose records are kept using EHR technology).

Objectives are not applicable to every practice, hence physicians who do not perform that activity would be excluded from having to meet that measure and it would not count towards their 5 deferred objectives.

If physicians work at multiple locations but do not have the technology available at all practices, 50 per cent of their total patient encounters would need to occur at locations where certified EHR technology is available and they would base all meaningful use measures only on encounters that occurred at the locations where the technology is available.

EPs may choose whether they participate in the Medicare or Medicaid program:

- **Medicare program (for EPs that demonstrate meaningful use):** implemented by federal government; reductions in payments for providers that do not demonstrate meaningful use; meaningful use must be demonstrated in year 1; maximum incentive is \$44 000 over 5 consecutive years for EPs; available to physicians (e.g. doctors of medicine, osteopathy, dental

surgery/medicine, podiatry, optometry, chiropractors); with an additional incentive for professionals who provide services in a designated health professional shortage area.

- **Medicaid program (for EPs that adopt, implement, upgrade or demonstrate meaningful use):** voluntary for States to implement; no Medicaid payment reductions; adopted/implemented/upgraded option for first participation year (where adopted means acquired and installed; implemented means commenced utilisation or and upgraded means expanded) and demonstration of meaningful use for up to 5 remaining participation years; maximum incentive is \$63 750 over 6 (not necessarily consecutive) years for EPs; States can included additional requirements for meaningful use; available to not only physicians but also other health professionals (e.g. nurse practitioners, certified nurse-midwives, dentists, some physician assistants).

Table 3 Meaningful Use of EHR Technology Objectives and Measures

Policy Priority	Stage 1 Core Set Objectives	Stage 1 Measure	Stage 2 Core Objectives	Stage 2 Measure
Improving quality, safety, efficiency, and reducing health disparities	Use computerized provider order entry (CPOE) for medication orders directly entered by any licensed healthcare professional who can enter orders into the medical record per state, local and professional guidelines	More than 30% of unique patients with at least one medication in their medication list seen by the EP have at least one medication entered using CPOE	Use CPOE for medication, laboratory and radiology orders directly entered by any licensed healthcare professional who can enter orders into the medical record per state, local and professional guidelines	More than 60% of medication, 30% of laboratory, and 30% of radiology orders created by the EP during the EHR reporting period are recorded using CPOE
	Implement drug-drug and drug-allergy interaction checks	The EP has enabled this functionality for the entire EHR reporting period		
	Generate and transmit permissible prescriptions electronically	More than 40% of all permissible prescriptions written by the EP are transmitted electronically using certified EHR technology	Generate and transmit permissible prescriptions electronically	More than 50% of all permissible prescriptions written by the EP are compared to at least one drug formulary and transmitted electronically using certified EHR technology
	Record demographics: preferred language, gender, race, ethnicity, date of birth, and date and preliminary cause of death in the event of mortality	More than 50% of all unique patients seen by the EP have demographics as recorded structured data	Record demographics: preferred language, sex, race, ethnicity, date of birth	More than 80% of all unique patients seen by the EP have demographics recorded as structured data
	Maintain up-to-date problem list of current and active diagnoses	More than 80% of all unique patients seen have at least one entry or an indication that no problems are known for the patient recorded as structured		

		data		
	Maintain active medication list	More than 80% of all unique patients seen by the EP have at least one entry or an indication that the patient is not currently prescribed any medication recorded as structured data		
	Maintain active medication allergy list	More than 80% of all unique patients seen by the EP have at least one entry or an indication that the patient has no known medication allergies recorded as structured data		
	Record vital signs: height, weight, blood pressure, calculate and display BMI, plot and display growth charts for children 2-20 years including BMI	For more than 50% of all unique patients aged 2 and over seen by the EP, height, weight, and blood pressure are recorded as structured data	Record and chart changes in vital signs: height/length and weight (no age limit); blood pressure (ages 3 and over); calculate and display BMI; and plot and display growth charts for patients 0-20 years including BMI	More than 80% of all unique patients seen by the EP have blood pressure (for patients age 3 and over only) and height and weight (for all ages) recorded as structured data
	Record smoking status for patients 13 years or older	More than 50% of all unique patients 13 years or older seen by the EP have smoking status recorded as structured data	Record smoking status for patients 13 years or older	More than 80% of all unique patients 13 years old or older seen by the EP have smoking status recorded as structured data
Implement one clinical decision support rule and the ability to track compliance with the rule	Implement one clinical decision support rule	Use clinical decision support to improve performance on high-priority health conditions	1. Implement 5 clinical decision support interventions related to 4 or more CQMs, if applicable, at a relevant point in patient care for	

				the entire EHR reporting period 2. The EP has enabled the functionality for drug-drug and drug-allergy interaction checks for the entire EHR reporting period
	Report CQMs to CMS or the States	For 2011, provide aggregate numerator, denominator, and exclusions through attestation For 2012, electronically submit clinical quality measures		
Engage patients and families in their healthcare	Provide patients with an electronic copy of their health information including diagnostic test results, problem list, medication lists, medication allergies, upon request	More than 50% of all unique patients of the EP who request an electronic copy of their health information are provided it within 3 business days	Provide patients the ability to view online, download, and transmit their health information within 4 business days of the information being available to the EP	1. More than 50% of all unique patients seen by the EP during the EHR reporting period are provided timely (available to the patient within 4 business days after the information is available to the EP) online access to their health information 2. More than 5% of all unique patients seen by the EP during the EHR reporting period (or their authorised representatives) view, download, or transmit to a third party their health information
	Provide clinical summaries for each office visit	Summaries provided to patients for more than 50% of all office visits within 3 business days	Provide clinical summaries for patients for each office visit	Clinical summaries provided to patients within one business day for more than 50% of office visits
Improve care	Capability to exchange key	Performed at least one test of the		

coordination	clinical information (e.g. problem list, medication list, allergies, diagnostic test results), among providers of care and patient authorised entities electronically	certified EHR technology's capacity to electronically exchange key clinical information		
Ensure adequate privacy and security protections for personal health information	Protect electronic health information created or maintained by certified EHR technology through the implementation of appropriate technical capabilities	Conduct or review a security risk analysis per 45 CFR 164.308 (a)(1) and implement updates as necessary and correct identified security deficiencies as part of the EP's risk management process	Protect electronic health information created or maintained by the certified EHR technology through the implementation of appropriate technical capabilities	Conduct or review a security risk analysis in accordance with the requirements under 45 CFR 164.308 (a)(1), including addressing the encryption/security of data at rest and implement security updates as necessary and correct identified security deficiencies as part of its risk management process
			Use secure electronic messaging to communicate with patients on relevant health information	A secure message was sent using the electronic messaging function of certified EHR technology by >5% of unique patients seen during the EHR reporting period
Policy Priority	Stage 1 Menu Set Objectives	Stage 1 Measure	Stage 2 Menu Objectives	Stage 2 Measure
Improving quality, safety, efficiency and reducing health disparities	Implement drug-formulary checks	The EP has enabled this functionality and has access to at least one internal or external drug formulary for the entire EHR reporting period		
	Incorporate clinical lab test results into certified EHR	More than 40% of all clinical lab test results ordered by the EP for	Incorporate clinical lab test results into certified EHR	More than 55% of all clinical lab tests results ordered by the EP

	technology as structured data	patients seen during the EHR reporting period whose results are either in a positive/negative or numerical format are incorporated in certified EHR technology as structured data	technology as structured data (Core in Stage 2)	during the EHR reporting period whose results are either in a positive/negative or numerical format are incorporated in certified EHR technology as structured data
	Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research or outreach	Generate at least one report listing patients of the EP with a specific condition	Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research or outreach (Core in Stage 2)	Generate at least one report listing patients of the EP with a specific condition
	Send reminders to patients per patient preference for preventive/follow up care	More than 20% of all unique patients 65 years or older or 5 years old or younger were sent an appropriate reminder during the EHR reporting period	Use clinically relevant information to identify patients who should receive reminders for preventive/follow-up care and send these patients the reminders, per patient preference (Core in Stage 2)	Use EHR to identify and provide reminders for preventive/follow-up care for more than 10% of patients with two or more office visits in the last 2 years
			Record electronic notes in patient records	Enter at least one electronic progress note created, edited and signed by an EP for more than 30% of unique patients
			Imaging results consist of the image itself and any explanation or other accompanying information are accessible through certified EHR technology	More than 10% of all scans and tests whose result is an image ordered by the EP for patients seen during the EHR reporting period are incorporated into or accessible through certified EHR

				technology
			Record patient family health history as structured data	More than 20% of all unique patients seen by the EP during the EHR reporting period have a structured data entry for one or more first-degree relatives or an indication that family health history has been reviewed
Engage patients and families in their health care	Provide patients with timely electronic access to their health information (including lab results, problem list, medication lists, medication allergies) within 4 business days of the information being available to the EP	More than 10% of all unique patients seen by the EP are provided timely (available to the patient within 4 business days of being updated in their certified EHR technology) electronic access to their health information subject to the EP's discretion to withhold certain information		
	Use certified EHR technology to identify patient-specific education resources and provide those resources to the patient, if appropriate	More than 10% of all unique patients seen by the EP are provided patient-specific education resources	Use clinically relevant information from certified EHR technology to identify patient-specific education resources and provide those resources to the patient (Core in Stage 2)	Patient-specific education resources identified by certified EHR technology are provided to patients for more than 10% of all unique patients with office visits seen by the EP during the EHR reporting period
Improve care coordination	The EP who receives a patient from another setting of care or provider of care or believes an encounter is relevant should perform medication	The EP performs medication reconciliation for more than 50% of transitions of care in which the patient is transitioned into the care of the EP	The EP who receives a patient from another setting of care or provider of care or believes an encounter is relevant should perform medication	The EP performs medication reconciliation for more than 50% of transitions of care in which the patient is transitioned into the care of the EP

	reconciliation		reconciliation (Core in Stage 2)	
	The EP who receives a patient from another setting of care or provider of care or refers their patient to another provider of care should provide a summary of care record for each transition of care or referral	The EP who transitions or refers their patient to another setting of care or provider of care provides a summary of care record for more than 50% of transitions of care and referrals	The EP who transitions their patient to another setting of care or provider of care or refers their patient to another provider of care should provide a summary of care record for each transition of care or referral (Core in Stage 2)	<ol style="list-style-type: none"> 1. The EP who transitions or refers their patient to another setting of care or provider of care provides a summary of care record for more than 50% of transitions of care and referrals 2. The EP who transitions or refers their patient to another setting of care or provider of care provides a summary of care record either a) electronically transmitted to a recipient using certified EHR technology or b) where the recipient receives the summary of care record via exchange facilitated by an organisation that is a Nationwide Health Information Network Exchange participant or is validated through an Office of the National Coordinator of Health Information Technology - established governance mechanism to facilitate exchange for 10% of transitions and referrals 3. The EP who transitions or refers their patient to another setting of care or provider of care

				must either a) conduct one or more successful electronic exchanges of a summary of care record with a recipient using technology that was designed by a different EHR developer than the sender's, or b) conduct one or more successful tests with the CMS-designated test EHR during the EHR reporting period
<p>Improve population and public health</p> <p>(unless an EP has an exception for these they must complete at least one as part of their Stage 1 demonstration of the menu set in order to be a meaningful EHR user)</p>	<p>Capability to submit electronic data to immunisation registries or immunisation information systems and actual submission in accordance with applicable law and practice</p>	<p>Performed at least one test of the certified EHR technology's capacity to submit electronic data to immunisation registries and follow-up submission if the test is successful (unless none of the immunisation registries to which the EP submits such information have the capacity to receive such information electronically)</p>	<p>Capability to submit electronic data to immunisation registries or immunisation information systems except where prohibited, and in accordance with applicable law and practice</p> <p>(Core in Stage 2)</p>	<p>Successful ongoing submission of electronic immunisation data from certified EHR technology to an immunisation registry or immunisation information system for the entire EHR reporting period</p>
	<p>Capability to submit electronic syndromic surveillance data to public health agencies and actual submission in accordance with applicable law and practice</p>	<p>Performed at least one test of certified EHR technology's capacity to provide electronic syndromic surveillance data to public health agencies and follow-up submission if the test is successful (unless none of the public health agencies to which the EP submits such information have the capacity to receive such information electronically)</p>	<p>Capability to submit electronic syndromic surveillance data to public health agencies except where prohibited, and in accordance with applicable law and practice</p>	<p>Successful ongoing submission of electronic syndromic surveillance data from certified EHR technology to a public health agency for the entire EHR reporting period</p>

			Capability to identify and report cancer cases to a public health central cancer registry, except where prohibited, and in accordance with applicable law and practice	Successful ongoing submission of cancer case information from certified EHR technology to a cancer registry for the entire EHR reporting period
			Capability to identify and report specific cases to a specialised registry (other than a cancer registry), except where prohibited, and in accordance with applicable law and practice	Successful ongoing submission of specific case information from certified EHR technology to a specialised registry for the entire EHR reporting period

Source: (CMS, 2012b)

Table 4 Meaningful Use of EHR Technology Clinical Quality Measures – Stage 1 Examples

Core Set CQMs		
Hypertension: blood pressure measurement	Preventive care and screening measure pair: a) tobacco use assessment, b) tobacco cessation intervention	Adult weight screening and follow-up
Alternate Core Set CQMs		
Weight assessment and counselling for children and adolescents	Preventive care and screening: influenza immunisation for patients 50 years old or older	Childhood immunisation status
Additional Set CQMs (must complete 3)		
Diabetes: HbA1c poor control	Diabetes: low density lipoprotein management and control	Diabetes: blood pressure management
Diabetes: eye exam	Diabetes: urine screening	Diabetes: foot exam
Diabetes: HbA1c control (<8.0%)	Controlling high blood pressure	Chlamydia screening for women
Heart failure: angiotensin-converting enzyme inhibitor or angiotensin receptor blocker therapy for left ventricular systolic dysfunction	Heart failure: beta-blocker therapy for left ventricular systolic dysfunction	Heart failure: warfarin therapy patients with atrial fibrillation
Coronary artery disease (CAD): beta-blocker therapy for CAD patients with prior myocardial infarction	CAD: oral antiplatelet therapy prescribed for patients with CAD	CAD: drug therapy for lowering low density lipoprotein cholesterol
Ischemic vascular disease (IVD): blood pressure management	IVD: use of aspirin or another antithrombotic	IVD: complete lipid panel and low density lipoprotein control
Cervical cancer screening	Breast cancer screening	Colorectal cancer screening
Pneumonia vaccination status for older adults	Anti-depressant medication management: a) effective acute phase treatment, b) effective continuation phase treatment	Primary open angle glaucoma: optic nerve evaluation
Diabetic retinopathy: documentation of presence or absence of macular oedema and level of severity of retinopathy	Diabetic retinopathy: communication with the physician managing ongoing diabetes care	Asthma pharmacologic therapy
Asthma assessment	Appropriate testing for children with pharyngitis	Use of appropriate medications for asthma
Oncology breast cancer: Hormonal therapy for stage IC-IIIC oestrogen receptor/progesterone receptor positive breast cancer	Oncology colon cancer: chemotherapy for stage III colon cancer patients	Prostate cancer: avoidance of overuse of bone scan for staging low risk prostate cancer patients
Smoking and tobacco use cessation, medical assistance: a)	Initiation and engagement of alcohol and other drug	Low back pain: use of imaging studies

advising smokers and tobacco users to quit, b) discussing smoking and tobacco use cessation medications, c) discussing smoking and tobacco use cessation strategies	dependence treatment: a) initiation, b) engagement	
Prenatal care: screening for human immunodeficiency virus	Prenatal care: anti-D immune globulin	

Sources: (CMS, 2010, CMS, 2012b, CMS, 2013a)

Canada

Table 5 Ontario Primary Care Reform Practice Types

Traditional FFS Practices	<ul style="list-style-type: none"> • Do not roster patients • Do not have to meet defined practice criteria (i.e. size, features) • Not eligible to receive performance-based incentive payments
Family Health Networks	<ul style="list-style-type: none"> • Introduced in 2002 • Require minimum of three family physicians • Minimum total roster of 2 400 for group of three, financial penalty for rosters less than minimum • Funded through blended capitation formula • Eligible for performance-based incentive payments • Preventive services incentives paid to practice, practice then decides how the funds are used
Family Health Groups	<ul style="list-style-type: none"> • Introduced in 2003 • Require minimum of three family physicians • Formal rostering is voluntary (but required to obtain certain payments) • Funded through blended formula where FFS is dominant • Physicians are eligible for preventive care incentives and some of the special payments • Preventive services incentives paid to physicians directly
Comprehensive Care Model	<ul style="list-style-type: none"> • Introduced in 2005 • Include physicians in solo practice • Require patient rostering • Funded through blended formula where FFS is dominant • Physicians are eligible for preventive care incentives, not eligible for special payments • Preventive services incentives paid to physicians directly
Family Health Organizations	<ul style="list-style-type: none"> • Introduced in 2006 (mostly converted from existing Health Service Organizations and Primary Care Networks) • Require minimum of three family physicians • Require patient rostering • Funded through blended capitation model • Physicians are eligible for all preventive care incentives and all special payments • Preventive services incentives paid to physicians directly

Adapted from (Hurley et al., 2011).