

Review of the Quality and Outcomes Framework in England

Final Report

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List of abbreviations

GP	General Practitioner
NHS	National Health Service
MeSH	Medical Subject Heading
QOF	Quality and Outcomes Framework
UK	United Kingdom
US	United States of America

Executive summary

The Quality and Outcomes Framework (QOF), an incentive scheme in general practice, was introduced across the UK in 2004 to link payment to delivery of primary medical care. Drivers for its introduction included the recognition that there were variations between general practices in the quality of care and the need to increase investment to improve morale and recruitment in primary care. QOF, in the early years, led to a reduction in inequalities in delivery of those aspects of care that it incentivised. Currently, there is little variation in QOF achievement between practices - most derive maximum, or near maximum income from it.

The QOF had other effects, encouraging nurse-led multidisciplinary management of chronic disease to deliver incentivised services, and better practice computerisation, so that delivery could be recorded.

However, the extent to which high QOF achievement means a higher quality service in general practice is not clear. Quality in primary care is difficult to define, but it certainly encompasses more than is measured by QOF. It is now explicit NHS policy to improve other aspects of primary care – in particular, to deliver better integrated, holistic and patient-centred care and more effective primary prevention in primary care. Whether QOF can deliver these policies has been questioned, as have its role in reducing inequalities and its ability to deliver better population health.

NHS England commissioned the Centre for Health Services Studies at the University of Kent, on behalf of the Policy Research Unit in Commissioning and the Healthcare System, to review the evidence of effectiveness of QOF in the context of a changing policy landscape. We examined the most recent evidence that QOF influences behaviour in general practice and health outcomes, taking a broad view of primary care quality. We also considered the evidence that QOF helps sustain changes in primary care and effects of withdrawing QOF indicators using recent patterns of QOF achievement and the published literature.

Our key findings were:

- most QOF indicators are unlikely to promote in any meaningful way the aims of the Five Year Forward View most relevant to primary care, that is, better holistic care, integrated care or patient-centred care
- QOF may motivate practices to maintain performance on QOF indicators, although these represent a limited, biomedical view of health and the quality of primary care; it is not clear, however, what would happen to the elements of care incentivised by QOF if the current indicators were retired
- QOF may divert practices from other aspects of providing high quality of primary care and from prioritising those patients with the greatest needs, for example, with difficult-to-manage problems, multiple morbidity or those that are hardest to reach
- there is no definitive evidence that QOF has an important impact on population health or emergency admissions.

1 Introduction

1.1 Background

The Department of Health introduced the Quality and Outcomes Framework (QOF) into the national contract between the NHS and general practitioners (GPs) in April 2004. The world's largest pay-for-performance scheme in primary health care, the QOF rewards practices financially for recording certain activities that may be considered to represent high quality of care, or outcomes that suggest that high quality care has been delivered. In England, most general practices derive 10-15% of total practice income from it.¹ Other income to practices comes from the capitation global sum (about £80 per patient per year) and payments for delivery of specific services.

This report, commissioned by NHS England in May 2016, considers the appropriateness of the current QOF indicator set in the light of recent research findings and changes to the English policy landscape, in particular, the 2014 Five Year Forward View.² This proposed new models of primary care to deliver new NHS priorities, to include:

- more patient-centred, personalised care of people with long-term conditions, empowering them to self-care
- more holistic management of people with multiple morbidity with better continuity of care
- better integrated care, breaking down traditional barriers between primary, secondary, mental health and social care
- primary prevention.

It has been recognised that QOF may not fit well with plans for new models of care.³ Some clinical commissioning groups implementing new models of care have already opted out of QOF to allow for locally-negotiated contracts.⁴

The Scottish Government is phasing out the QOF altogether, in favour of developing a reward framework that recognises the importance of building long-term relationships with individuals and the community, and better access, continuity of care and holistic care.⁵

1.2 How does the QOF work?

Under the QOF, general practices are awarded points, each attracting a payment, for recording specific activities or outcomes described in a set of indicators. The number of points earnable varies by indicator. Some indicators reward a practice-level activity, for example, being able to identify a list of patients with a particular condition, and others reward the practice for the proportion of patients who have received a component of clinical care or who have achieved a particular outcome. For this latter type of indicator, the practice receives points on a sliding scale between a lower and upper threshold according to the proportion of relevant patients recorded as receiving the care or achieving the outcome.

Practices may record patients as 'exceptions', meaning that the patient is not included when calculating proportions. This may be because the patient has recently registered with the practice, has a contraindication to the incentivised intervention, or actively refuses the intervention, for

example. It acts as a safeguard against clinical decisions being inappropriately affected by financial conflicts of interest, overtreatment, or removal of patients for whom it may be more difficult to achieve QOF indicators from practice lists.

In the first years after the inception of QOF in 2004, there were around 130 to 150 indicators, covering clinical areas (chronic disease management and public health services e.g. contraceptive services and cervical screening), practice organisation (e.g. information for patients, education and training, medicines management) and patient experience. The number of indicators was cut more drastically in 2014 to around 80. The main difference was that the organisational and patient experience indicators were dropped. Drivers for this reduction included the introduction of the Care Quality Commission inspection regime, which measured performance on similar indicators. However, primary care academics have suggested that the unreliability of the some of the organisational and patient experience indicators may have contributed to the decision to drop them, for example, some had unintended consequences and others were too easy to achieve.⁶

The clinical areas covered by QOF prioritise common disease areas causing significant morbidity or mortality where the main responsibility for care is in general practice, and where there is evidence of health benefits arising from intervention. Since 2009, the National Institute of Health and Care Excellence has developed the indicators based on an explicit evidence-based process.⁷

In 2016/17, a practice may earn a maximum of 559 points across 77 indicators, each point attracting a payment of £165.18.⁸ Payments are weighted by list size and measures of disease prevalence.⁸ NHS England pays English practices about £700 million a year through QOF, about 10% of the total net payments to GP practices of just over £7 billion (2014/5 data).¹

1.3 Why should the QOF be reviewed?

NHS England, in the General Practice Forward View of April 2016, acknowledged that the way quality of general practice is measured and rewarded may need modification. It undertook to review the QOF in response to arguments that it had 'served its purpose' and was 'a barrier to holistic management of health conditions'.⁹

1.3.1 Has the QOF served its purpose?

At its inception in 2004, among the key drivers for QOF were the need for a mechanism to improve investment in general practice in a context of poor morale and low recruitment, and a recognition that there was variation in the quality of care delivered between practices.^{7,10} QOF's original documented purpose was to reward GPs for 'volume and quality of work'.¹¹

Now, there are many different perspectives on the purpose of the QOF (e.g. those of the Department of Health, British Medical Association, NHS England, Public Health England, individual GPs). The QOF may be seen as a mechanism to:

- reward good practice
- standardise care between practices
- drive up quality of care
- provide practice income for investment in services
- improve health.

The QOF was always voluntary but participation grew rapidly, and in recent years there has been very high level of participation (98% practices). Most practices now achieve maximum or near maximum remuneration.¹ Patterns of QOF achievement by socioeconomic deprivation suggest that the gap in achievement between the least and most deprived practices narrowed over the first few years.¹² There were other early side-effects (in particular, wider use of electronic medical records in order to record QOF-related activity), more transparent information on primary care performance and more widely-delivered nurse-led multidisciplinary care of chronic disease, which was considered a more effective way of delivering care to QOF standards.¹⁰

However, it is not clear whether, in 2016, the QOF is having an important effect on quality of care in general practice. It is also unclear how the QOF is affecting inequalities in health and care. It may even worsen inequalities: patients who benefit most from the QOF may be those who are easiest to manage, because there is no incentive to achieve more than the upper threshold for each indicator (which, for most indicators, is between 70% and 90% of patients recorded as receiving care⁸); the 10-30% who do not receive the care may be those with the most challenging problems, with the greatest needs. What would happen to primary care quality if the QOF were discontinued (assuming similar levels of practice remuneration) is not known.

The question of whether QOF improves population health has also been debated.¹³ While QOF indicators are based on evidence of effectiveness, largely from randomised controlled trials, the size of the effect of QOF on population health (compared with, say, interventions tackling the broader determinants of health) is unclear.

1.3.2 Is the QOF a barrier to more holistic care?

While there have been changes to the QOF since its inception, the emphasis on care of chronic disease, a major part of general practice workload, has been a constant feature, with further chronic conditions added to the original list over 2005 to 2013. Sixty five of the current 77 indicators measure clinical activities or outcomes related to the care of chronic disease.⁸

Data for any quality indicator need to be easily and reliably measurable,⁷ which means that the indicators measure precisely defined activities, mostly relating to care of single chronic diseases. However, the reality is that most people with chronic disease have more than one condition,¹⁴ and management of one often needs to take into account of others, and the patient's needs based on their social, economic and physical environment.¹⁵ It may be that focusing on single aspects of single diseases does not promote the kind of integrated, holistic, patient-led care of chronic conditions envisaged by the Five Year Forward View.² The vision of the Five Year Forward View is in line with what are regarded as key attributes of a competent GP by the Royal College of General Practitioners (e.g. able to communicate sensitively and effectively while promoting patient-centred care, able to deliver a coordinated holistic team-based approach to care of patients with long-term conditions and care that takes account of the patient's social context¹⁶).

The compelling need to generate practice income means that practices may need to prioritise QOF-related activities rather than focus on providing the type of care envisaged by the Five Year Forward View. In 2015, Royal College of General Practitioners called for the replacement of the QOF by a 'new funding arrangement that allows GPs more freedom to focus on providing the best possible holistic care'.¹⁷

1.4 Workload and job satisfaction in general practice

UK general practice is said to be facing a crisis,¹⁸ with rising workload,¹⁹ low levels of recruitment and retention,²⁰ high occupational stress, and the lowest job satisfaction since the introduction of the 2004 General Medical Services contract.²¹ This may be explained by a number of factors. One is a return to the long-term underlying trend of increasing numbers of the oldest old (who have high levels of disability²²), after a dip in the mid-2000s because of low birth rates during the First World War and the 1919 influenza pandemic.²³ Alongside this, social care budgets – critical to the effective primary health care of people with mental and physical disabilities, especially if they are socially isolated – have fallen since the financial crisis in 2008.²⁴ Moreover, health technology continues to advance in a context of very limited increases in NHS funding with which to deliver it.²⁵

GPs may see the QOF negatively as onerous and bureaucratic, and as distorting their clinical practice, but this view is balanced by the recognition that QOF is essential to maintaining a stable practice income that supports innovative practice and attracts good staff.^{6, 26}

1.5 Aims of the review

NHS England asked the Policy Research Unit in Commissioning and the Health Care System to review the QOF to inform negotiation of the English GP contract (General Medical Services contract) for 2017/18. Our aim was to examine the evidence that QOF maintains or increases the quality of primary medical care, taking a broad view of quality, and taking into account the current NHS vision for primary care. We considered the potential downsides of the QOF, including unintended consequences for patients, workload and costs of administration and the potential harms of withdrawing indicators.

1.6 How the review was carried out

The project was carried out between May and October 2016. NHS England's brief in early May 2016 was to carry out an academically robust review of QOF indicators to inform negotiation of the 2017/18 General Medical Services contract to provide primary medical care in England. The questions to be answered by the literature review were refined and agreed at the end of May 2016. The advisory group met by teleconference in August 2016 to discuss a draft report of the literature review. At this stage, we were asked also to examine recent patterns of QOF indicator achievement. The advisory group met again, face-to-face, in September 2016, to discuss preliminary findings. We circulated further written evidence for consideration following this meeting and received comments up until the end of October 2016.

1.7 Structure of this report

Section 2 describes patterns of QOF achievement since 2011 (with data included in Appendix 1), and Section 3 reports on the review of the literature (with supplementary information included in Appendices 2 and 3). Section 4 discusses the findings and provides conclusions.

2 Recent national patterns of achievement of QOF indicators in England

2.1 Introduction and methods

This section sets out national patterns of achievement of QOF indicators in England from 2011/12 to 2014/15. Data for 2015/16 had not been published at the time of carrying out the project.

In 2011/12, there were 142 indicators. The number of indicators was reduced by 2014/15 to 81, and by 2016/17 to 77. We collated data on achievement from 2011/12 to 2014/15 only for the 77 indicators that were included in the 2016/17 indicator set with similar wording. However, some of the changes to the indicators over this period would have influenced achievement data significantly, for example, changing the timescales over which an indicator needed to be achieved, or updating the technology of a screening or diagnostic test (details of these changes are available on www.nhsemployers.org/QOF). Also, the number of points that could be earned and thresholds for achieving remuneration were modified for many indicators over the period. The changes over the period mean that we cannot interpret trends in achievement for most indicators.

Data were obtained from the NHS Digital website (<http://qof.hscic.gov.uk/>) and were downloaded in September 2016.

The achievement data reflect the percentage of all eligible patients who received the care set out in the indicator, net of exceptions. 'Exceptions' were patients who could be removed from the denominator in calculating percentages for specific agreed reasons.⁸ Points were awarded on a sliding scale between a low and high threshold (no points if the practice did not reach the lower threshold, and maximum points if it reached the upper threshold). For some of the practice organisation indicators, the practice was awarded points for carrying out the activity with no sliding scale, receiving 'all or nothing'.

We categorised the 77 indicators according to the type of activity or outcome rewarded:

Practice-level activities (n=25)

These indicators measured activities that were implemented at a practice rather than individual patient level, such as disease registers (which provide an estimate of prevalence and in most cases denominators for indicators implemented at patient level) (n=20), policies and protocols (n=4), or case-finding (n=1; the only indicator of this type relates to hypertension (indicator ID BP-002)).

Patient-level process activities (n=41)

Indicators of this kind at the patient-level measured activities to confirm or refine a diagnosis (n=5), to review or monitor patients with chronic conditions (n=16), or to deliver interventions (e.g. prescribe, screen or immunise) (n=20).

Patient-level outcomes (n=11)

Indicators of this kind measured patient-level health outcomes. These were all intermediate outcomes, for example, physiological or biochemical measures such as blood pressure or cholesterol levels, rather than those that have a direct impact on patient experience.

2.2 Findings

2.2.1 Practice-level activities

We found no evidence of significant downward or upward trends in achievement of the 25 indicators in this group; there were few wording changes that were likely to affect interpretation over the period.

National achievement for all indicators was greater than 96% in 2014/15, except for the osteoporosis register indicator (OST004) (89%) and the case-finding for hypertension indicator (BP002) (91% of patients; upper threshold 90%) (Appendix 1, Tables 1.1 and 1.2).

2.2.2 Patient-level process activities

For the 41 process indicators, we saw no clear evidence of changes in achievement over the period, although interpretation of trends was limited by changes to most of the indicators over the same period.

Refining or confirming a diagnosis

In 2014/5, for all five indicators relating to refining or confirming a diagnosis, the national percentage of patients recorded as having received the care was 87% to 95% except for the indicator measuring behaviour to identify underlying causes of dementia (DEM003: 84%).

For all these indicators, national achievement met the upper threshold for achieving maximum points (Appendix 1, Table 1.3).

Exception rates were lower than 10%, except for the indicator measuring referrals for investigation in stroke or transient ischaemic attack (STIA008, exception rate 13%).

Reviewing or monitoring patients

In 2014/15, for the 16 process indicators measuring activity to review or monitor patients with chronic conditions, the national percentage of patients recorded as having received the care was 84% to 97% except for the indicator measuring asthma reviews using the three Royal College of Physicians questions (AST003; 75%) (Appendix 1, Table 1.4).

For all the indicators, national achievement was either greater than the upper threshold, or fewer than two percentage points below it.

Exception rates were greater than 10% for 6/16 indicators. These were highest for reviews of patients with depression (DEP003; 25%), reviews of patients with cancer (CAN003; 15%) and recording of spirometry in patients with chronic obstructive pulmonary disease (COPD004; 15%).

Delivering interventions

In 2014/15, for all the 20 process indicators measuring interventions, the national percentage of patients recorded as having received the intervention, was 82% to 97%.

Achievement was either greater than the upper threshold or fewer than two percentage points below it, except for two indicators: smoking cessation offers (SMOK004) and pharmacological treatment of diabetic nephropathy (DM006) (Appendix 1, Table 1.5).

Exception rates were greater than 10% for 13/20 indicators. These were highest for statins in people

with hypertension and a high cardiovascular risk (CVD-PP001; 30%), education programmes for patients with diabetes (DM014; 26%) and cervical screening in women with severe mental illness (MH008; 20%).

2.2.3 Patient-level outcomes

For the 11 outcome indicators, interpretation of trends was limited by changes to most of the indicators over the period; however, we saw no clear evidence of changes in % of patients in whom the outcomes were achieved over the period (Appendix 1, Table 1.6).

In 2014/15, the percentage of patients in whom the outcomes were achieved was between 80% and 92%, except for the indicators relating to relatively tight control of biochemical or physiological markers in diabetes: tight blood pressure control (DM003; 78%); tight control of glycosylated haemoglobin (DM007; 70%); and moderate control of glycosylated haemoglobin (DM008; 78%).

Achievement met the upper threshold or was fewer than two percentage points below, except for the three indicators measuring achievement of glycosylated haemoglobin levels.

Exception rates in 2014/15 in the outcome indicators group were lower than for the intervention indicators – for 3/11 indicators the exception rate was greater than 10%: cholesterol control in diabetes (DM004; 12%); the tightest control of glycosylated haemoglobin (DM007; 14%); moderate control of glycosylated haemoglobin (DM008; 12%).

2.3 Summary points

- We were unable to interpret trends in the percentage of patients receiving the care or in whom the outcome was achieved over 2011/12 to 2014/5 for most indicators because of changes to the indicators over the period.
- In 2014/15, the percentage of eligible patients recorded as having received the care or achieved the outcome set out by QOF indicators was between 80% and 97% for all except four out of the 77 indicators, at a national level.
- In 2014/15, for all except five of the 77 indicators, the upper threshold for achieving maximum points was met or very nearly met, at a national level.
- Exception rates were lower than 10% for most indicators, but tended to be greater than 10% for the indicators measuring patient reviews or monitoring, and especially for those measuring interventions.

3 Review of the literature

3.1 Review aims and questions

The aim of the review was agreed with NHS England in May 2016 and was to summarise the research evidence that QOF overall, and the individual indicators, measure the quality of primary care in the current policy context, and incentivise appropriate behaviours in primary care.

After initially scoping the literature, we refined the central questions about effectiveness of QOF to:

- *what is the evidence that QOF changes outcomes in general practice?*

We considered that evidence that QOF has influenced any aspect of delivery of care in general practice, taking a broader view than solely processes and biomedical outcomes. We considered the aims of current English NHS priorities and plans to improve primary care, and the potential downsides of the QOF as a mechanism for funding general practice, for example, perverse incentives and costs of administration both at practice-level and centrally.

- *what is the evidence that changes in outcomes associated with QOF can be sustained?*

We considered the evidence that QOF can sustain any changes in practice that may be achieved for more than the initial period after implementation.

- *what is the evidence that withdrawing QOF indicators has changed outcomes?*

We considered the evidence that withdrawing QOF as a whole or QOF indicators causes a fall in quality or whether change in practice is sustained after withdrawal.

In the course of the review, we also found other studies that were likely to contribute to understanding the effects of pay-for-performance in primary medical care. These fell into three supplementary subject areas:

- *variations in exception reporting by practice, disease group or indicator threshold*

Studies of this kind quantified exception rates (which included rates of excluding patients for logistical reasons, clinical reasons or informed dissent) and examined the factors associated with variation in exception rates.

- *qualitative data about QOF*

Studies of this kind examined qualitative data patients and primary care staff using interviews, focus groups and ethnographic observations.

- *effect of pay-for-performance in primary care in other countries*

Studies of this kind examined effectiveness of pay-for-performance schemes in primary medical care in other high-income countries.

3.2 Methods

3.2.1 Overview of methods

To answer the three central review questions about effectiveness of QOF, we conducted a comprehensive search for quantitative studies. We synthesised these qualitatively because the studies had heterogeneous methods and outcomes so were not suitable for quantitative synthesis.

During the course of this search, we also identified studies that included data relating to the three supplementary subject areas (exception reporting, qualitative data and pay-for-performance in other countries) and summarised these.

3.2.2 Search definition

The search aimed to identify published peer-reviewed empirical research relating to pay-for-performance schemes in primary care in high income countries, focusing particularly on QOF. We sought only English language publications. We developed inclusion and exclusion criteria using the convention of Population, Interventions, Comparators, Outcomes, and Study design (PICOS). These were:

Population

We included studies of populations registered with primary medical practitioners in high income countries, focusing on studies of practices participating in the QOF in the UK. We excluded studies examining quantitative data from fewer than four primary care trusts (or the equivalent area following abolition of primary care trusts) on the grounds that the results were not likely to be generalisable to the whole of England.

Interventions

We included studies of

- introducing pay-for-performance in primary medical care
- changing the pay-for-performance scheme (raising or lowering thresholds for payment or adding or retiring the scheme or elements of the scheme)
- variation in achievement on pay-for-performance – as a measure of its ‘intensity’

We excluded studies of UK local pay-for-performance schemes implemented alongside QOF.

Comparators

We included studies where the comparator was

- for longitudinal studies, any other method of funding general medical practice, concurrent or historical; if there was no concurrent comparator, analyses needed to control for underlying trends
- for cross-sectional studies, any other concurrent method of funding general practice, or populations registered with practices with lower achievement on pay-for-performance.

We excluded studies with neither concurrent controls nor attempts to control for underlying trend.

Outcomes

We included studies examining any measures of quality in primary medical care as outcomes, including

- patient health outcomes, including
 - physiological or biochemical measures with an association with morbidity or mortality outcomes e.g. glycosylated haemoglobin, blood pressure, cholesterol level
 - mortality
 - morbidity
 - health inequalities e.g. by deprivation, gender, disease group, ethnicity, geography
 - hospital admissions
 - patient experience, quality of life, or satisfaction
- processes of delivery of care, including
 - diagnostics, reviews, care plans, monitoring, interventions, for example, prescribing or preventive interventions
 - coordination or integration of care, that is, promoting seamless care between primary, secondary, mental health and social care, continuity of care
 - holistic care, that is, care that considers multiple morbidity and social context
 - patient-centred care, that is care which is personalised, and encourages patient choice and self-management
 - inequalities in delivery of care
- unintended effects, for example, effects on non-incentivised activities
- organisational functioning, staff experience, practitioner and practice workload
- costs and cost-effectiveness.

We excluded

- quantitative studies in which the researchers estimated or modelled outcomes rather than reporting empirical data on findings
- quantitative studies where the outcome was QOF achievement measured using number of points achieved rather than percentage of patients in which the indicator was achieved.

Study design and quality

We included

- systematic reviews
- randomised controlled trials
- longitudinal studies where the analysis controlled for underlying trends (e.g. interrupted time series)
- controlled before-and-after studies

- cross-sectional studies

We excluded

- commentary articles, or those not reporting empirical data
- studies examining data collected before 2004 (date of introduction of QOF) only
- single point-in-time quantitative analyses of practice with no relevant cross-sectional or longitudinal analyses.

3.2.3 Search strategy

We first searched electronic databases for systematic reviews published between January 2004 and May 2016. Since we found several good quality relevant systematic reviews published between 2011 and 2015, asking the same or similar questions as ours that would have synthesised the research up to that data), we searched the databases for primary research only from 2012 to 2016 for primary studies that had not been included in the systematic reviews. We searched Medline, Embase, the Cochrane Database and Health Management Information Consortium using the terms:

- *Quality Outcomes Framework (keyword) OR*
- *Quality and Outcomes Framework (keyword) OR*
- *QOF (keyword)*

Studying the keywords and references of papers identified suggested a number of other useful search terms/combinations of term, which we also used to search the databases:

- *Pay-for-performance (keyword) or Reimbursement (Medical Subject Heading (MeSH) term) AND*
- *Primary health care (keyword) or Primary Health Care (MeSH term) OR*
- *Primary medical care (keyword) or Family practice (MeSH term) OR*
- *General practice (keyword) or General Practice (MESH term)*

We examined references of identified papers to search for further reports and we asked experts for references to other relevant research.

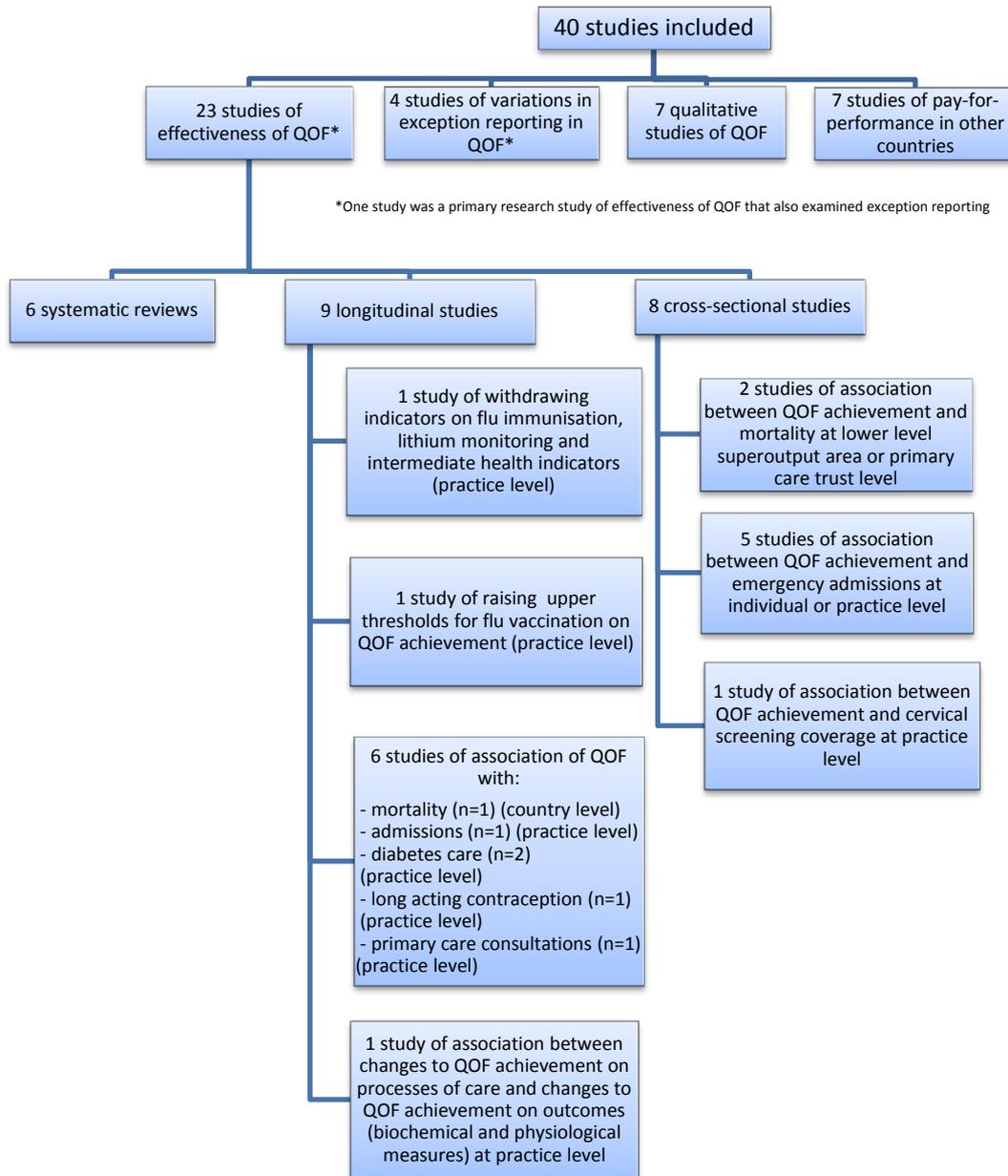
3.3 Results

The search of electronic databases identified 178 relevant unique references. We also found, from reference lists and personal contact with experts a further 16 references. After screening all abstracts, we obtained the full text of 81 papers. Two researchers independently extracted data on methods from these papers, and applied exclusion criteria. We extracted full data from 40 research reports.

To answer the main review questions about effectiveness of QOF, we included six systematic reviews and 17 primary quantitative research studies. For the supplementary subject areas, we identified four quantitative studies examining reporting of exception rates in the QOF, seven qualitative studies of the QOF, and seven quantitative studies examining pay-for-performance schemes in other high income countries.

The flow chart in Appendix 2 details exclusions at each stage of the review. Figure 1 provides a summary of the studies we included.

Figure 1. Summary of designs of included studies



3.3.1 Effectiveness of the QOF: systematic reviews

Description of the reviews

We found a systematic review of systematic reviews (Eijkenaar *et al* 2013, search date 2012) of pay-for-performance in health care.²⁷ This included eight relevant reviews (i.e. studying pay-for-performance in primary care rather than other settings, in high income countries) with search dates between 2005 and 2011 (including a Cochrane Review).

We found five further systematic reviews of primary research evidence that had not been included in the systematic review of reviews.²⁸⁻³² All five reviews included studies about the QOF: two focused solely on the QOF^{28,29} and three examined pay-for-performance in primary care in other countries in addition to the QOF.³⁰⁻³²

The first systematic review (Langdown *et al* 2014, search date 2012) focused on the effects of QOF on health outcomes or biochemical or physiological markers of these.²⁸ It included 11 studies, all quantitative and of at least moderate quality. It did not examine the effect on inequalities in health or health care.

The second systematic review (Gillam *et al* 2012, search date 2011) also studied effects of QOF, but had less strict inclusion criteria on study design and quality, and examined other types of outcomes, including inequalities, patient experience, and cost-effectiveness.²⁹ It included 70 quantitative studies.

The third systematic review (Houle *et al* 2012, search date 2012), examined any effects of pay-for-performance in primary care in the UK and elsewhere. It included 30 studies, of which 13 were about QOF in the UK and 17 in other countries.³⁰

The two other reviews examined specific outcomes:

- Hamilton *et al* 2013 (search date 2011, 18 studies, 11 of which were carried out in the UK: 10 of QOF; 1 of a pre-QOF scheme) examined the effect of pay-for-performance on delivery of smoking cessation interventions and quit rates.³¹
- Rashidian *et al* 2015 (search date 2015, 3 studies examining pay-for-performance, 2 of which were about QOF in the UK) examined the effect of pay-for-performance on prescribing behaviour.³²

None of the reviews specifically examined the effect of removing pay-for-performance indicators or schemes on quality of primary medical care.

The five systematic reviews together included 74 quantitative studies of QOF, all published between 2006 and 2012. Of these, 23 were included in more than one review. Forty nine studies were included solely by Gillam *et al*²⁹ (which used less strict inclusion criteria than the others), one solely by Hamilton *et al*³¹ and one solely by Houle *et al*.³⁰ No studies were included by all five reviews. Of the studies included by more than one review, two were included by four reviews, five by three reviews and sixteen by two reviews (Appendix 3, Table 3.1 shows how the reviews overlapped).

Findings of the reviews

The Eijkenaar *et al* 2013 review of systematic reviews²⁷ concluded that

- there was no evidence of effects of pay-for-performance on hospital admissions or mortality

- pay-for-performance may reduce inequalities in incentivised activities by socioeconomic status, although not by age, sex and ethnicity
- there was inconsistent evidence of effects on intermediate health outcomes and processes of health care and intermediate health outcomes
- evidence of cost-effectiveness was very limited
- pay-for-performance in primary care may have a negative effect on continuity of care and other unincentivised activities
- people with worse health were less likely to be included in pay-for-performance schemes.

Langdown *et al* 2014 concluded that the QOF had modest positive effects on health outcomes over and above the underlying trend of improvement after the introduction of QOF but these effects were short-lived and followed by a plateau in performance.²⁸ It also found evidence of negative effects of QOF on non-incentivized activities.

Gillam *et al* 2012²⁹ concluded that

- the QOF had modest positive effects on incentivized activities that subsequently returned to the underlying trend of improvement
- the gap in achievement of the QOF indicators between richer and poorer areas had narrowed, as had age and ethnic inequalities, but not gender inequalities
- evidence of cost-effectiveness of the QOF was insufficient
- QOF did not change patients' reports of their experience in primary care in relation to communication, nursing care, coordination or satisfaction, but continuity of care was perceived to have worsened.

Houle *et al* 2012³⁰ found that pay-for-performance in primary care

- was associated with modest positive effects on immunisation and cervical screening rates; they did not report the extent to which these effects were sustained
- had no effect of pay-for-performance on other types of preventive care
- was associated with a modest improvement in achievement of incentivized indicators in the care of chronic disease, but on a previous trend of improving achievement, suggesting that the improvement was not necessarily due to pay-for-performance
- was associated with a decline in continuity of care.

Rashidian *et al* 2015 found modest effects of pay-for-performance in primary care on prescribing behaviour but no effect on health outcomes.³²

Hamilton *et al* 2013 found modest to moderate effects of pay-for-performance in primary care on provision of smoking cessation interventions but no effects on quit rates and longer term abstinence.³¹

3.3.2 Effectiveness of the QOF: primary quantitative research

Description of studies: methods, interventions and outcomes

Of the 17 studies, eight were cross-sectional and nine were longitudinal. More detail of the methods is provided in Appendix 3, Tables 3.2 and 3.3.

All the eight cross-sectional studies included studies of data from all practices (about 8,000 practices) participating in the QOF across the whole of England.³³⁻⁴⁰ These examined how:

- outcomes at individual patient level varied by achievement of QOF indicators for that patient,³³ or
- average outcomes at cluster level (e.g. practice, lower level superoutput area, primary care trust) varied by average QOF indicator achievement at that level.³⁴⁻⁴⁰

The nine longitudinal studies (interrupted time series, cohort studies or controlled before-and-after studies)⁴¹⁻⁴⁸ examined the effect on trends in outcomes of:

- implementing QOF,^{41, 42, 44-47} or
- improvements in QOF achievement on processes of care,⁴⁹ or
- raising QOF thresholds (for influenza immunisation),⁴³ or
- withdrawing indicators (relating to influenza immunisation in asthma and lithium treatment monitoring, withdrawn in 2006/7, and monitoring of blood pressure, cholesterol, and blood glucose in diabetes, withdrawn in 2011/12).⁴⁸

Among the longitudinal studies, one examined the effect of QOF on trends in outcomes across the whole of UK compared with other high income countries.⁴⁷ The other eight examined how outcomes varied by QOF achievement with the UK either in

- all ~8,000 practices participating in QOF in England,^{43, 44, 49} or
- a sample of 581 English practices selected randomly,⁴¹ or
- a sample selected because of their participation in the UK General Practice Research Database or Clinical Practice Research Datalink (516 UK practices,⁴² 148 English practices selected for representativeness of all English practices,⁴⁵ 627 UK practices,⁴⁶ 644 English practices⁴⁸; all practices were distributed across either the UK or England, rather than in one region).

The 17 studies examined the effect of QOF on following outcomes:

- mortality (n=3)^{39, 40, 47}
- hospital admissions (n=6)^{33, 35-38, 44}
- biochemical or physiological markers of health outcomes derived from QOF indicators (n=2)^{45, 49}
- processes of care (n=7); some of these are derived from QOF indicators: recording of smoking status, body mass index, blood pressure, diagnoses or monitoring and other interventions immunisations, smoking cessation, screening; other outcomes used were prescribing, referrals, and consultation rates.^{34, 41-43, 45, 46, 48}

Two of the studies specifically examined the effect of QOF on inequalities, by age,⁴⁵ gender,⁴⁵ socioeconomic position,^{44, 45} or number of comorbid conditions.⁴⁵

We did not find any studies examining the effect of QOF on:

- integrated or holistic care
- continuity of care
- patient-centred care/self-care
- patient experience
- primary care team working, workload or morale
- costs or cost-effectiveness.

Quality

All the cross-sectional studies used data from all practices across England. However, all the cross-sectional studies may be inherently flawed for examining whether the QOF improved outcomes, because QOF achievement was high in all participating practices. There were no representative practices or patients in England that had not been exposed to the QOF, or had been exposed to poor QOF achievement, with whom to compare outcomes in those with high QOF achievement.

Moreover, while all the cross-sectional studies attempted to control for potential confounding factors (in other words, factors associated with both QOF achievement and outcome and that might explain the association e.g. socioeconomic deprivation), there may be other, possibly unknown, confounding factors that were not controlled for.

The nine longitudinal studies used large samples of practices across England or the UK: four studies examined all practices, four studies between 500 and 700 practices across the UK or England, and one study 148 practices across England. These studies examined trends in outcomes before and after introduction of QOF, changes in thresholds or withdrawing indicators, meaning that outcomes in the presence of the QOF intervention are compared with outcomes in the absence of the QOF intervention and are therefore more reliable than those of the cross-sectional studies. We cannot be sure, however, that the QOF-related intervention was solely responsible for any change in outcomes, as other policies and other events may have contributed.

Findings

What is the evidence that QOF changes outcomes in general practice?

All eight cross-sectional studies and eight of the longitudinal studies examined this question. More detail of the findings can be found in Appendix 3, Tables 3.2 and 3.3.

Health outcomes

- two cross-sectional studies and one longitudinal study found no association between QOF achievement and mortality^{39, 40, 47}
- one longitudinal study found that after the introduction of QOF, the trend of increasing admission rates for all conditions was modestly lower for admissions for conditions for which care was incentivised in QOF compared with conditions for which care was not incentivised in QOF (by 7-9%); the difference was mainly driven by smaller than expected increases in emergency admission rates for coronary heart disease⁴⁴

- four cross-sectional studies found inconsistent associations between higher QOF achievement and lower emergency admission rates for epilepsy,³⁶ heart failure,³⁵ dementia,³⁸ and cancer³³; where present, the associations were very modest
- one cross-sectional study found a modest association between higher QOF achievement and higher admission rates for mental illness³⁷
- one longitudinal study found a modest association between improvements in QOF process of care achievement and QOF outcome of care achievement over 2004 to 2008.⁴⁹

Health and process outcomes

- one longitudinal study found moderate trend-adjusted improvements in a composite indicator of quality of care of diabetes (which included both process and outcome measures) increased 14% over and above the underlying trend in the first year).⁴⁵

Process outcomes

- one cross-sectional study found a modest positive association between QOF achievement and cervical screening coverage³⁴
- one longitudinal study found a modest positive effect on consultation rates among people with severe mental illness compared with consultation rates among other people after introduction of the QOF in 2004. There was a trend of increasing consultation rates in patients overall over the period, with a small step change in 2004, but the rate of increase was greater in people with severe mental illness.⁴⁶ The face-to-face consultation rate in severe mental illness was about 9 per patient per year 2000-2003, rising to 11 per patient per year in 2011. The face-to-face consultation rate in people without severe mental illness was about 5 per patient per year over the whole period.
- one longitudinal study found a moderate positive effect of the introduction of QOF in 2004 on prescribing of antidiabetic medication within two years of diagnosis in Type 2 diabetes (changing the direction of the trend of decreasing initiation rates to increasing initiation rates)⁴²
- one longitudinal study found a moderate positive effect of the introduction of QOF indicators for prescribing of long acting reversible contraception in 2009, increasing by 4% annually compared with being stable before the relevant QOF indicator was introduced⁴¹
- one longitudinal study found that increasing the upper achievement threshold for influenza immunisations in people with coronary heart disease from 85% to 90% increased immunisation rates by 0.4% compared with immunisations rates in conditions for which the upper threshold had not increased.; exception reporting also increased.⁴³

Inequalities outcomes

- one longitudinal study found that QOF introduction had little effect on inequalities in measures of processes of care of Type 2 diabetes and measures of diabetic control, blood pressure and cholesterol by age, gender, practice deprivation and years since diagnosis⁴⁵
- one longitudinal study found no clear effect of QOF introduction on inequalities in trend-adjusted emergency admission rates by income deprivation at practice level⁴⁴

What is the evidence that changes in outcomes associated with QOF are sustained?

Five studies examined this question.^{41, 42, 44-46}

Health outcomes

- one study found that the initially very small difference between emergency admission rates for conditions for which care was incentivised by QOF and those for conditions for which care was not incentivised by QOF increased steadily over 2004-10 (from 3% in the first year to 8% in 2010); overall emergency admission rates increased by 34% over the period.⁴⁴

Health and process outcomes

- one study that the increase in a composite indicator of quality of care of diabetes (which included both process and outcome measures) declined over time: 14% in first year, and 7% in third year.⁴⁵

Process outcomes

- one study found that the rate of increase in consultations among people with severe mental illness slowed between 2004 and 2011, but the difference in consultation rates between people with severe mental illness and people with no severe mental illness remained greater than before QOF⁴⁶
- one study found that the positive effect of the introduction of QOF in 2004 on prescribing of antidiabetic medication in Type 2 diabetes was sustained at a similar rate until the end of the study period in 2008⁴²
- one study found that the increase in prescribing of long acting reversible contraception in 2009 was sustained at the same rate, 4% per year, until the end of the study period in 2012.⁴¹

What is the evidence that withdrawing QOF indicators has changed outcomes?

One study examined this question and found that performance for lithium treatment monitoring remained stable for five years, although there was a small drop in influenza immunisations in patients with asthma.⁴⁸ There was no fall in performance after one year of follow up for the other withdrawn QOF indicators (further analysis of long term effects is under way, personal communication, Tim Doran, 2016).

Tables 3.2 and 3.3 in Appendix 3 summarise the results of these studies.

3.3.3 Exception reporting

We found four studies examining exception reporting.^{43, 50-52}

Doran *et al*⁵¹ found that exception rates were low (median 4.5%), but there was variation between indicators in exception reporting, rates being higher for than intervention and outcome indicators. Logistical exceptions (e.g. patient recently registered with the practice) were most common (41% of exceptions) and clinical (e.g. patient had contraindications to an interventions) least common (8%), with 30% being reported as due to informed dissent (e.g. where patients actively decline an intervention). Higher practice level exception reporting was associated with lower payment

thresholds, higher points values and lower numbers of patients, younger doctors, failure to secure maximum remuneration in the previous year, greater list size, and higher levels of area deprivation. Most practices achieved the upper thresholds even before applying exception rules. The researchers also noted that for many of the patients who were excepted, the indicators had been achieved, which, they suggest, may mean that practices are quick to apply exceptions, or may pre-emptively apply exceptions at the beginning of the financial year if they believe they will not achieve their targets.

Kontopantelis *et al*⁵⁰ studied individual patients and found that the odds of being excepted was higher among older people, more deprived people and people with multiple morbidity. Patients who had been described as exceptions were more likely to die in the following year, whether the exception was for clinical reasons or informed dissent.

Martin *et al*⁵² found that exception rates in indicators relating to measurement of body mass index and blood pressure were higher in people with serious mental illness than people with chronic kidney disease.

Kontopantelis *et al*⁴³ found that increasing upper payment thresholds for influenza immunisation in chronic disease was associated with increased exception rates.

3.3.4 Qualitative studies of QOF

Description of studies

We found seven relevant studies.

One study examined patients' views of QOF using semi-structured interviews.⁵³

Four studies examined perspectives of pay-for-performance among primary care staff, including GPs, practice managers, practice nurses, and administrative staff, using semi-structured interviews or recordings of consultations.^{54-56 57} One of these also included data from interviews with patients.⁵⁷

Of these four studies:

- Lester and colleagues collected a broad range of views from a range of primary care staff about QOF eight years after its introduction.⁵⁶
- Cheraghi-Sohi and colleagues focused on how QOF had influenced the nature of medical professionalism in general practice, in particular clinical discretion.⁵⁵
- A further study by Cheraghi-Sohi and colleagues examined the views of salaried GPs of the 2004 General Medical Services contract changes.⁵⁴
- Chew-Graham and colleagues examined how the QOF had influenced consultations in primary care.⁵⁷

Two further studies examined the experience of screening, or case-finding, for depression in patients with coronary heart disease and diabetes as part of QOF, one in Scotland and one in England.^{58, 59} Indicators of this activity were in the QOF indicator set until 2013/4, when they were discontinued. The first study used an ethnographic design observing behaviour of practice nurses and patients,⁵⁸ while the second collected data in focus groups with GPs and practice nurses.⁵⁹

Findings of studies

Patients' perceptions of pay-for-performance

The study focusing on patients' perspectives of QOF identified five key themes⁵³:

- the value of financial incentives in primary care: most participants did not think that pay-for-performance was an appropriate tool to promote quality of care; most of them thought that poor-quality care was the exception in general practice
- payment for simple tasks: the participants were surprised that doctors were paid for carrying out simple tasks and thought that they should not get financial rewards for activities that were central to the GP role
- impact on received care: few participants had noticed a change in the structure or process of care since the implementation of QOF
- the use of computers: the participants had noticed greater use of computers in consultations than previously, however, they often viewed this as positive because they were able to read information about their clinical care and discuss the results during consultations more easily
- unintended consequences: a minority of respondents were concerned by the possibility that GP would focus on incentivised areas at the expense of other important issues.

The other study that examined patients' perspectives found that they had perceived that elements of consultations were target-related and felt that these were irrelevant to their problems.⁵⁷

Perspectives of primary care professionals

Researchers in the study of primary care staff's views eight years after implementation of QOF organised their findings⁵⁶ around three themes:

- Routinisation of QOF into primary care work
 - staff felt a sense of pride in practising evidence-based medicine
 - QOF became routine because of its importance for practice finances, and gave a structure to the practice year.
- Impact of QOF on medical professionalism
 - QOF led to potential conflict of interests between GP and patient
 - QOF led to a reduction of autonomy and professionalism.
- Evolution of QOF in a primary care setting
 - the indicators could be more challenging and have an educational and organisational focus
 - there should be a greater involvement of practice teams in developing indicators.

The study of ways which QOF had influenced the nature of medical professionalism, in particular the concept of clinical discretion,⁵⁵ categorised these as:

- Bureaucratic: a greater use of rules and standardisation of GP behaviours, reducing professional discretion

- Social: QOF changed working relationships in the practice because of collective responsibility to meet contractual requirements
- Organisational: practices did have discretion to implement QOF as they wished
- Economic: the financial imperative to maintain practice income influences behaviour
- Political: because QOF integrates central government policy into clinical practice, potentially reducing professional discretion

The study examining how QOF influenced consultations found that QOF-orientated consultations were characterised by missed opportunities for GPs and practice nurses to respond to the patient's needs, whether biomedical, emotional or informational.⁵⁷

In the study of salaried GPs' experience of the changes in the GP contract in 2004,⁵⁴ participants felt that the new contract hindered GPs' ability to deliver holistic care and continuity of care, although most thought that QOF had improved and standardised clinical care.

Case-finding: patients and professionals

The studies of case-finding for depression found obstacles to appropriate screening for depression, which could lead to a systematic under-detection. The researchers found that there was insufficient time in consultations to screen for depression in a context of competing practice priorities. Health professionals lacked the knowledge, confidence, skills and resources to manage depression and sometimes found it difficult to cope with their own emotional responses. They found it difficult to reconcile the conflict between the mechanical nature of case-finding and the need for a more holistic approach. The patients with coronary heart disease did not see themselves as individuals at risk of depression, so did not understand why they had to answer questions on the subject.

3.3.5 Pay-for-performance in primary care in other high-income countries

Description of studies

We found five studies of the effectiveness of pay-for-performance schemes in primary care in the US⁶⁰⁻⁶³ and Canada⁶⁴: three randomised controlled trials,⁶⁰⁻⁶² one controlled before-and-after study⁶³ and one interrupted time-series.⁶⁴ The outcomes examined in these studies were biochemical markers of health outcomes only (lipid levels),⁶² process measures only (cancer screening rates),⁶⁴ or both processes and biochemical or physiological markers of health outcomes.^{60, 61, 63}

We found two further studies examining whether removing incentives in US managed care organisations changed outcomes.^{65, 66} One focused on secondary rather than primary care,⁶⁶ however, it also examined removal of incentives that would, in the UK, be primarily the responsibility of primary care (pneumococcal immunisation, angiotensin converting enzyme inhibitor or angiotensin receptor blocker prescription in heart failure); therefore, we have included the findings here. This study followed achievement following removal of the financial incentives for these two activities for 2-3 years.⁶⁶ The other study examined achievement following removal of financial incentives in primary care for cervical screening and diabetic retinopathy screening for 4-5 years.

None of these seven studies is directly relevant to the UK context, in view of the differences in organisation and funding of health care between this and the North American countries.

Findings of studies

The first randomised controlled trial found that offering financial incentives to both primary care physicians and patients to achieve cholesterol levels was more effective after one year than no intervention.⁶² Incentives to physicians alone or to patients alone did not achieve clinically or statistically significant falls in cholesterol levels. Whether the effect was sustained was not reported, nor were unintended consequences of the interventions.

The second randomised controlled trial found that financial incentives improved blood pressure control but only if the incentives were paid to the individual physician rather than the practice.⁶¹ The effect was not sustained after withdrawal of the incentive scheme. There was no increase in reported episodes of hypotension during the trial.

The third randomised controlled trial found that financial incentives for cardiovascular risk factor control improved some processes of care and blood pressure control, but had no effect on cholesterol control.⁶⁰ Whether the effect was sustained was not reported; nor were adverse effects.

The controlled before-and-after study found modest effects of three different financial incentive schemes on some biochemical or physiological measures of outcome and processes of care.⁶³ Whether the effects were sustained was not reported.

The interrupted time-series study in Canada found no effect of incentivizing cancer screening on cancer screening rates.⁶⁴

One of the studies of removing incentives found no change in pneumococcal immunisations over two years but a fall in angiotensin converting enzyme inhibitor or angiotensin receptor blocker prescribing after three years.⁶⁶ The other found that withdrawing financial incentives for cervical screening and diabetic retinopathy screening led to a fall in achievement over the following 4-5 years.⁶⁶

3.4 Summary points

Reviews of research up until 2012 found that in the years soon after the inception of QOF, achievement of incentivised indicators increased and inequalities in achievement reduced. The evidence on health outcomes suggested that improvements were modest and that there had been a return to the underlying trend after the initial improvement. The reviews found limited evidence that QOF had had negative effects on unincentivised activities.

More recent evidence suggests that QOF has not reduced population mortality. QOF may have improved intermediate health outcomes (biochemical and physiological markers), but these effects became less marked over three years.

The introduction of QOF was associated with a modest reduction in the increasing trend of emergency hospital admission rates, and this effect was sustained for a few years. Whether this effect is causally related to QOF is not clear, because it was not possible to disentangle the effects of other policies and trends over that period.

There is evidence that QOF has been associated with modestly increased consultation rates among people with severe mental illness, although this effect may have become less marked over time. As for emergency admissions, it was not possible to be sure that this effect is causally related to QOF.

The evidence that QOF has improved processes of care in Type 2 diabetes was inconsistent. We

found some evidence that QOF was associated with an increase in prescribing of long acting reversible contraception and that this effect was sustained for a few years.

We found a limited amount of research examining inequalities, but this suggested that, while in the past QOF may have reduced variation in some aspects of care, it has not further reduced inequalities in processes of care by age, comorbidity, gender or deprivation.

We found no evidence of the effect of QOF on any other aspect of quality in general practice, for example, integrated care, holistic care, patient-centred care, costs, cost-effectiveness, or GP workload, morale or team-working.

Exception reporting

We found evidence that zealously applying exceptions to maximise practice income (known as 'gaming') is not common, because exception reports are generally low and most practices reach upper thresholds even before applying exceptions. People with more complex health issues and mental health issues are more likely to be excepted. Increasing upper payment thresholds may be associated with increasing exception rates.

Patient and professional perceptions of QOF

Patients were surprised that their practice received 'bonuses' for doing what they regarded as standard care and suggested that it could have effects on unincorporated activities. The QOF was thought by professionals to have reduced clinical autonomy and discretion, changing the nature of medical professionalism and encouraged a more biomedical model, not addressing wider needs of patients.

Pay-for-performance in primary care in other high-income countries

Pay-for-performance in primary care in other countries was associated with inconsistent modest effects on processes and outcomes and we found no evidence to suggest that any of these effects would be sustained. Removing pay-for-performance may result in professionals being less likely to carry out previously incentivised activities. However, the results of the studies of pay-for-performance in primary care in other countries are unlikely to be relevant to the UK context.

4 Discussion

4.1 Recent patterns of QOF achievement

Most English general practices have reached the upper payment thresholds for QOF and therefore maximum remuneration. The implication of this 'ceiling effect' is that practices may not have been strongly motivated to increase their achievement further, for example, achieving the targets in those who have the complex and difficult-to-manage problems, but who are not excepted. For some of the more ambitious outcome indicators, for example, measures of strict blood glucose control of diabetes, it may be that practices are not motivated to achieve upper thresholds because the role of patient compliance is so strong that they are seen as unachievable. The lack of reliable trend data means that we cannot draw any conclusions about whether practices were motivated to improve achievement over the 2011-2014 period.

In 2014/5, exception rates were less than 10% for most indicators. It is not possible to ascertain from the available data what the 'correct' exception rate is for each indicator, and in any case this will vary by practice because of differences in population makeup. However, the low use of exceptions suggests that what is known as 'gaming' (working particularly hard to identify patients as exceptions in order to maximise points earned and therefore income) was not common. Moreover, it appears that there are good reasons for high exception rates where they occur. For example, many intervention indicators had high exception rates because patients may decline to receive interventions more readily than investigations or clinical reviews. Also, we expected the observed high exception rates for some of the outcome indicators, because for many, patient compliance to lifestyle advice is critical and patients may actively decline to follow this.

4.2 Review of the literature

We found evidence that the effect of QOF on health outcomes such as glycaemic control in diabetes or high blood pressure is likely to be modest and short-lived and may not translate into improvements in population mortality. This might at first sight be surprising given that the indicators are based on high quality evidence of effectiveness of interventions. The lack of effect may be because other factors than those incentivised by QOF care determine population health more strongly, in particular in the social and physical environment (e.g. low income, experience of inequality or discrimination, social status, education, unhealthy housing, physically or psychologically unhealthy work conditions, outdoor air pollution),⁶⁷ or non-incentivised activities in primary care. Or it may be that effectiveness of interventions demonstrated in randomised controlled trials is diluted in routine clinical practice, a recognised phenomenon occurring because of the strict inclusion criteria of many trials.⁶⁸

We found evidence to suggest that QOF was associated with a modest slowing of the increase in emergency admissions for certain conditions for which care is incentivised by QOF. However, the role of QOF in causing this is unclear; there are many other factors that could have affected trends in admission rates for these conditions preferentially, such as the increasing medicalisation of the oldest old,⁶⁹ national standards for the management of coronary heart disease,⁷⁰ or the implementation of the four-hour wait standard in accident and emergency departments, leading to

admission to prevent breaches.⁷¹ Among interventions to prevent emergency admissions, pay-for-performance may not be one of the most effective.^{72, 73}

We found some evidence that QOF may have positive effects on some processes of care. However, the evidence suggests that the effect is short-lived for most of these.

We found no evidence that QOF is reducing inequalities in processes of care or outcomes that were incentivised by QOF.

Drawing any conclusions from the research evidence is, however, difficult because of the limitations of the methods used – which is unavoidable given that QOF was implemented nationally from the start, so there have never been any reliable concurrent controls. Examining trends in this way, however rigorously, is limited because other political and social influences may have changed the way practices or patients behave.

We found no evidence of the effects of QOF on other aspects of primary care, specifically on the delivery of holistic care, continuity of care, integrated care or patient-centred care – those elements of primary care that are prioritised in the Five Year Forward View. In fact, research to date has not attempted to identify the effects on these outcomes, having examined effects only on easily measurable outcomes, for example those collected as part of QOF, or routinely available data on mortality, emergency admissions, consultation rates, and prescribing. We did not find evidence of systematic scientific attempts to define what we mean by high quality of care in general practice, develop and validate measures of this, and evaluate the QOF on this basis.

4.3 Coherence of QOF with the Five Year Forward View

The elements of the Five Year Forward View² most relevant to the delivery of primary care are

- holistic care - promoting care that considers multiple morbidity and the social context of the patient
- integrated care - promoting seamless care between different types of care i.e. primary, secondary, mental health and social
- patient-centred care - promoting patient self-care and informed choice
- primary prevention - promoting prevention of disease in healthy people.

We found no research that has satisfactorily evaluated the effects of QOF on these aspects of care.

Multidisciplinary meetings, reviews and care plans are necessary elements of holistic and integrated care (as set out in recent guidance from the National Institute of Health and Care Excellence⁷⁴). Five of the current QOF indicators measure these activities, for palliative care, cancer, severe mental illness, dementia and rheumatoid arthritis; however, achieving the indicators does not explicitly require holistic or integrated care to have been delivered: they do not require practices to describe in detail the nature of the interventions.

Fourteen of the indicators are concerned with primary preventive interventions i.e. smoking cessation, recording obesity, smoking and alcohol consumption, cervical screening, and influenza immunisation, so may be considered to promote primary prevention.

Most QOF indicators, however, measure activities that are about single dimensions of primary care.

4.4 Implications of QOF for primary care professionals

The QOF has implications for the primary care workforce.⁷⁵ Since 2004, practice nurses carry out far more consultations – an increase from 21% to 35% of general practice consultations,⁷⁶ and there have been changes to professional boundaries.⁷⁷ Many routine tasks have passed from GPs to practice nurses or health care assistants, and there has been reorganisation of care into chronic disease clinics. Practice staff to carry out the information technology tasks needed to collate data for QOF have also increased.

Pay-for-performance schemes to retain, attract and motivate primary healthcare professional represent a narrow view of motivational and satisfaction mechanisms. An evidence synthesis on GP recruitment and retention show that there is little evidence to support the idea that financial schemes increase satisfaction or reduce demotivation or dissatisfaction.⁷⁸

The evidence suggests that QOF may have positive and negative effects on motivation for primary care professionals and this highlights the need to consider both intrinsic and extrinsic motivational factors, and among extrinsic factors, to consider non-financial rewards. For example, practice nurses may be motivated by an increase in clinical autonomy⁷⁹ (intrinsic), a reduction in routine tasks^{80, 81} (intrinsic), an increase in status⁸¹ (extrinsic), and becoming a specialist in a chronic disease⁸¹ (extrinsic and intrinsic). Practice nurses may be demotivated by inequalities between GPs and their own salary reward structure^{75, 81} (extrinsic) and by changes to the nurse-patient relationship which may have become more transactional and focused on the QOF incentivised disease^{79, 81} (intrinsic). GPs may be motivated by practising evidence-based care and reducing inequalities (intrinsic and extrinsic), but may be demotivated by not being able to focus on holistic care, the doctor-patient relationship and the increased sense of scrutiny and control⁷⁹ (intrinsic).

4.5 Conclusions and implications

We found that the evidence that QOF improves health care quality is limited. First, because QOF was implemented throughout the UK, there are no reliable controls in the studies. Second, while QOF has led to a lot of research attempting to evaluate its effect, what has been published to date tends to report its effect using performance on the QOF indicators themselves or other routinely available data as measures of quality. None of the research we found identified in the first instance a measure of high quality of care and used it to evaluate the QOF.

The universally high QOF achievement means that practices have little motivation to improve achievement further for existing indicators. Raising thresholds further may even lead to increased exception reporting in order to raise apparent achievement with no real increase in the desired activity. This means that QOF is unlikely to be an effective mechanism for improving performance, although the evidence suggests that it motivates practices to maintain performance – but as measured by QOF indicators alone. We found no evidence that QOF encourages any other aspect of primary care performance than those elements incentivised by the QOF. In particular, it does not reward holistic care, integrated care or patient-centred care. Therefore, there is no evidence that QOF will advance progress towards the aims of the Five Year Forward View significantly. QOF encourages a narrow, biomedical view of health care performance, and ‘high performance’ does not necessarily mean ‘high quality’.

The evidence suggests that QOF may divert practices and professionals from ways of providing high

quality of primary care that are not QOF-related. QOF does not incentivise practices to target patients with the greatest needs for primary care because these are more likely to be excepted. Even if they are not excepted, practices have no motivation to prioritise more difficult-to-treat patients over those with less complex problems.

We found no evidence that QOF is an effective mechanism for reducing inequalities in health and health care. It may even worsen inequalities if patients in whom clinical objectives are more easily met are targeted by QOF activities rather than those with more complex health and social problems.

We found no definitive evidence that QOF has any significant effect on population health nor emergency admissions. We also found no evidence of its cost-effectiveness, so its value cannot be compared with that of other health care interventions.

We found no definitive evidence to inform us what would happen to performance on QOF indicators were the financial incentive removed, and no evidence to inform us what would happen to quality of primary care – although it is unlikely that this would be significant given the narrow view of quality that the QOF embodies. Were the QOF to be abolished, it is important to remember, though, that it provides a major component of practice income; practices must be protected from loss of income, which would almost certainly have a detrimental effect on patient care and further worsen recruitment and retention in primary care. Moreover, it is important to consider retaining aspects of QOF that may deliver benefits; for example, GPs report (anecdotally) that they find the electronic prompts to deliver care of long term conditions useful, so that they can be sure that certain issues have been dealt with without having to search through case-notes.

Motivation to deliver high quality care among health professionals is complex, but it is likely that other motivational factors than financial rewards may be effective. If the NHS is to deliver the aims of the Five Year Forward View, in the context of a demoralised primary care workforce, it is important to consider other measures of quality of primary care and other ways of motivating health professionals to deliver high quality care.

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Appendices

Appendix 1. Patterns of QOF indicator achievement 2011-14

Appendix 2. Flow chart of inclusions and exclusions from the review

Appendix 3. Tables

Appendix 1. Patterns of QOF indicator achievement 2011-2014

Table 1.1: QOF achievement on disease registers (n=20)

Disease area	ID	Indicator	Points [†]	2011/12	2012/13	2013/14	2014/15
				% achievement*			
Atrial fibrillation	AF001	The contractor establishes and maintains a register of patients with atrial fibrillation	5	99.8	99.8	99.9	99.9
Asthma	AST001	The contractor establishes and maintains a register of patients with asthma, excluding patients with asthma who have been prescribed no asthma-related drugs in the preceding 12 months	4	100.0	99.9	100.0	100.0
Cancer	CAN001	The contractor establishes and maintains a register of all cancer patients defined as a 'register of patients with a diagnosis of cancer excluding non-melanotic skin cancers diagnosed on or after 1 April 2003'	5	99.9	99.9	99.9	100.0
Coronary heart disease	CHD001	The contractor establishes and maintains a register of patients with coronary heart disease	4	99.9	99.9	99.9	98.2
Chronic kidney disease	CKD001	The contractor establishes and maintains a register of patients aged 18 or over with CKD (US National Kidney Foundation: Stage 3 to 5 CKD)	6	99.8	99.8	99.9	99.9
Chronic obstructive pulmonary disease	COPD001	The contractor establishes and maintains a register of patients with COPD	3	99.9	99.8	99.9	99.9
Dementia	DEM001	The contractor establishes and maintains a register of patients diagnosed with dementia	5	99.2	99.3	99.6	99.6
Diabetes	DM017	The contractor establishes and maintains a register of all patients aged 17 or over with diabetes mellitus, which specifies the type of diabetes where a diagnosis has been confirmed	6	100.0	100.0	99.9	100.0
Epilepsy	EP001	The contractor establishes and maintains a register of patients aged 18 or over receiving drug treatment for epilepsy	1	99.9	99.9	99.9	100.0
Heart failure	HF001	The contractor establishes and maintains a register of patients with heart failure	4	99.7	99.7	99.8	99.8
Hypertension	HYP001	The contractor establishes and maintains a register of patients with established hypertension	6	100.0	100.0	100.0	100.0
Learning disability	LD003	The contractor establishes and maintains a register of patients with learning disabilities wording change in 2014/15 (removal of restriction to those age 18+)	4	99.5	99.5	99.6	99.8
Mental health	MH001	The contractor establishes and maintains a register of patients with schizophrenia, bipolar affective disorder and other psychoses and other patients on lithium therapy	4	100.0	100.0	100.0	100.0
Osteoporosis	OST004	The contractor establishes and maintains a register of patients: 1. Aged 50 or over and who have not attained the age of 75 with a record of a fragility fracture on or after 1 April 2012 and a diagnosis of osteoporosis confirmed on DXA scan, and 2. Aged 75 or over with a record of a fragility fracture on or after 1 April 2014	3	-	87.0	93.5	89.2
Peripheral arterial disease	PAD001	The contractor establishes and maintains a register of patients with peripheral arterial disease	2	-	99.6	99.7	99.8
Palliative care	PC001	The contractor establishes and maintains a register of all patients in need of palliative care/support irrespective of age	3	89.0	89.9	98.3	98.5
Obesity	OB001	The contractor establishes and maintains a register of patients aged 16 or over with a BMI ≥ 30 in the preceding 12 months	8	100.0	100.0	100.0	100.0
Contraception	CON001	The contractor establishes and maintains a register of women aged 54 or under who have been prescribed any method of contraception at least once in the last year, or other clinically appropriate interval e.g. last 5 years for an IUS	4	100.0	99.9	99.9	100.0
Rheumatoid arthritis	RA001	The contractor establishes and maintains a register of patients aged 16 or over with rheumatoid arthritis	1	-	-	99.8	-
Stroke and transient ischaemic attack	STIA001	The contractor establishes and maintains a register of patients with stroke or TIA	2	99.9	99.9	99.9	100.0

*% of practices achieving the indicator

[†]Number of points per practice available 2014/5

Table 1.2: QOF achievement on other practice organisation indicators (n=5)

Disease area	ID	Indicator	Points [†]	2011/ 12	2012/ 13	2013/ 14	2014/ 15
CASE FINDING				% achievement**			
Blood pressure	BP002	% of patients aged 45 or over who have a record of blood pressure in the preceding 5 years	15	-	-	-	91.0
POLICIES AND PROTOCOLS				% achievement*			
Smoking	SMOK003	The contractor supports patients who smoke in stopping smoking by a strategy which includes providing literature and offering appropriate therapy	2	-	-	99.3	99.6
Palliative care	PC002	The contractor has regular (at least 3 monthly) multi-disciplinary case review meetings where all patients on the palliative care register are discussed	3	96.9	97.7	95.0	96.7
Cervical screening	CS004	The contractor has a policy for auditing its cervical screening service and performs an audit of inadequate cervical screening tests in relation to individual sample-takers at least every 2 years	2	97.3	96.4	98.7	99.6
Cervical screening	CS001	The contractor has a protocol that is in line with national guidance agreed with the NHS CB for the management of cervical screening, which includes staff training, management of patient call/recall, exception reporting and the regular monitoring of inadequate sample rates	7	98.5	99.0	99.2	99.8

*% of practices achieving the indicator

**% 'underlying achievement' i.e. proportion of eligible patients with a record of this, net of exceptions)

†Number of points per practice available 2014/5

Table 1.3: QOF achievement on process indicators measuring confirmation or refinement of diagnosis of chronic disease (n=5)

Disease area	ID	Indicator	Points [†]	Thres- holds (%) [†]	2011/ 12	2012/ 13	2013/ 14	2014/ 15	Excep- tions (%) [†]
					% achievement**				
Asthma	AST002	% of patients aged 8+ with asthma (diagnosed on or after 1 April 2006), on the register, with measures of variability or reversibility recorded between 3 months before or any time after diagnosis wording change in 2013/14	15	40-80	87.2	87.6	88.2	88.4	4.7
Chronic obstructive pulmonary disease	COPD002	% of patients with COPD (diagnosed on or after 1 April 2011) in whom the diagnosis has been confirmed by post bronchodilator spirometry between 3 months before and 12 months after entering on to the register wording change in 2013/14	5	45-80	93.0	91.3	90.7	89.3	9.8
Dementia	DEM003	% of patients with a new diagnosis of dementia recorded in the preceding 1 April to 31 March with a record of FBC, calcium, glucose, renal and liver function, thyroid function tests, serum vitamin B12 and folate levels recorded between 6 months before or after entering on to the register wording change in 2013/14	6	35-70	83.5	76.6	80.2	81.5	8.3
Heart failure	HF002	% of patients with a diagnosis of heart failure (diagnosed on or after 1 April 2006) which has been confirmed by an echocardiogram or by specialist assessment 3 months before or 12 months after entering on to the register wording change in 2013/14	6	50-90	95.7	95.3	95.3	95.2	4.6
Stroke and transient ischaemic attack	STIA008	% of patients with a stroke or TIA (diagnosed on or after 1 April 2008) who have a record of a referral for further investigation between 3 months before or 1 month after the date of the latest recorded stroke or TIA wording change in 2014/15	2	45-80	89.6	88.7	88.0	87.9	12.9

**% 'underlying achievement' i.e. proportion of eligible patients with a record of this, net of exceptions.

†Number of points per practice available, upper and lower thresholds and exception rates 2014/5. Points were rewarded on a sliding scale between a lower and an upper threshold.

Table 1.4: QOF achievement on process indicators measuring ongoing review of chronic disease (n=16)

Disease area	ID	Indicator	Points [†]	Thres-holds (%) [†]	2011/12	2012/13	2013/14	2014/15	Excep-tions (%) [†]
					% achievement**				
Atrial fibrillation	AF002	The percentage of patients with atrial fibrillation in whom stroke risk has been assessed using the CHADS2 risk stratification scoring system in the preceding 12 months (excluding those whose previous CHADS2 score is greater than 1) NB not included in 2014/15 set. Reintroduced in 2015/6 as AF006 using updated risk stratification score	10 (for 2013/4)	40-90 (for 2013/4)	-	97.2	97.5	-	-
Asthma	AST003	% of patients with asthma, on the register, who have had an asthma review in the preceding 12 months that includes an assessment of asthma control using the 3 RCP questions wording changes in 2012/13 and 2013/14	20	40-70	78.1	74.8	75.5	75.3	7.5
Asthma	AST004	% of patients with asthma aged 14 or over and who have not attained the age of 20, on the register, in whom there is a record of smoking status in the preceding 12 months wording changes in 2012/13 and 2013/14	6	45-70	89.0	89.3	88.6	88.2	4.9
Cancer	CAN003	% of patients with cancer, diagnosed within the preceding 15 months, who have a patient review recorded as occurring within 6 months of the date of diagnosis wording changes in 2013/14 and 2014/15	6	50-90	93.3	93.2	91.5	94.7	15.4
Chronic obstructive pulmonary disease	COPD004	% of patients with COPD with a record of FEV ₁ in the preceding 12 months wording change in 2013/14	7	40-75	88.8	88.4	86.3	86.3	15.1
Chronic obstructive pulmonary disease	COPD003	% of patients with COPD who have had a review, undertaken by a healthcare professional, including an assessment of breathlessness using the Medical Research Council dyspnoea scale in the preceding 12 months Wording change 2013/14	9	50-90	91.8	91.1	89.6	89.8	11.1
Chronic obstructive pulmonary disease	COPD005	% of patients with COPD and Medical Research Council dyspnoea grade ≥3 at any time in the preceding 12 months, with a record of oxygen saturation value within the preceding 12 months	5	40-90	-	-	94.5	95.9	1.5
Dementia	DEM002	% of patients diagnosed with dementia whose care plan has been reviewed in a face-to-face review in the preceding 12 months Wording change 2013/14 NB. Changed in 2015/16 to DEM004 with an increase in points available to 39	15	35-70	79.3	83.2	83.8	84.0	8.3
Depression	DEP003	% of patients aged 18 or over with a new diagnosis of depression in the preceding 1 April to 31 March, who have been reviewed not earlier than 10 days after and not later than 56 days after the date of diagnosis Wording change 2014/16	10	45-80	-	-	78.1	84.5	24.5
Diabetes	DM012	% of patients with diabetes, on the register, with a record of a foot examination and risk classification: 1) low risk (normal sensation, palpable pulses), 2) increased risk (neuropathy or absent pulses), 3) high risk (neuropathy or absent pulses plus deformity or skin changes in previous ulcer) or 4) ulcerated foot within the preceding 12 months wording change 2013/14	4	50-90	89.6	90.4	88.3	88.3	7.6
Mental health	MH007	% of patients with schizophrenia, bipolar affective disorder and other psychoses who have a record of alcohol consumption in the preceding 12 months Wording change 2013/14	4	50-90	89.6	90.9	88.5	89.5	10.2
Mental health	MH003	% of patients with schizophrenia, bipolar affective disorder and other psychoses who have a record of blood pressure in the preceding 12 months Wording change 2013/14	4	50-90	91.7	92.0	90.9	89.5	9.0
Mental health	MH002	% of patients with schizophrenia, bipolar affective disorder and other psychoses who have a comprehensive care plan documented in the record, in the preceding 12 months, agreed between individuals, their family and/or carers as appropriate	6	40-90	88.4	87.3	85.9	88.3	12.6
Mental health	MH009	% of patients on lithium therapy with a record of serum creatinine and TSH in the preceding 9 months	1	50-90	96.3	95.9	96.2	96.6	3.2
Smoking	SMOK002	% of patients with any or any combination of the following conditions: CHD, PAD, stroke or TIA, hypertension, diabetes, COPD, CKD, asthma, schizophrenia, bipolar affective disorder or other psychoses whose notes record smoking status in the preceding 12 months Wording change 2013/14	25	50-90	95.6	95.8	95.3	94.1	0.9
Rheumatoid arthritis	RA002	% of patients with rheumatoid arthritis, on the register, who have had a face-to-face review in the preceding 12 months	5	40-90	-	-	89.7	-	7.4

**% 'underlying achievement' i.e. proportion of eligible patients with a record of this, net of exceptions

[†]Number of points per practice available and upper and lower thresholds 2014/5 (unless otherwise stated). Points were rewarded on a sliding scale between a lower and an upper threshold.

Table 1.5: QOF achievement on process indicators measuring interventions (n=20)

Disease area	ID	Indicator	Points [†]	Thres-holds (%) [†]	2011/	2012/	2013/	2014/	Excep-tions (%) [†]
					12	13	14	15	
Anticoagulants and antiplatelet medication									
Atrial fibrillation	AF005	In patients with atrial fibrillation and CHADS2 score of >1, % of patients who are currently treated with anticoagulants NB in 2015/16, renamed and reworded as AF007 in using updated risk stratification score; points earnable increased to 12 and the upper threshold to 90%.	6	40-70	-	81.3	86.3	85.3	12.9
Coronary heart disease	CHD005	% of patients with coronary heart disease with a record in the preceding 12 months that aspirin, an alternative anti-platelet therapy, or an anti-coagulant is being taken Wording change 2013/14	7	56-96	93.3	93.3	95.6	95.9	4.4
Peripheral arterial disease	PAD004	% of patients with peripheral arterial disease with a record in the preceding 12 months that aspirin or an alternative anti-platelet is being taken Wording change 2013/14	2	40-90	-	90.4	91.8	92.7	6.8
Stroke and transient ischaemic attack	STIA007	% of patients with a stroke shown to be non-haemorrhagic, or a history of TIA, who have a record in the preceding 12 months that an anti-platelet agent, or an anticoagulant is being taken. Wording change 2013/14	4	57-97	93.6	93.8	96.4	97.1	5.5
Influenza immunisation									
Coronary heart disease	CHD007	% of patients with coronary heart disease who have had influenza immunisation in the preceding 1 August to 31 March Wording changes 2013/14	7	56-96	92.5	92.2	94.3	95.3	14.9
Diabetes	DM018	% of patients with diabetes, who have had influenza immunisation in the preceding 1 August to 31 March Wording change 2013/14	3	55-95	90.7	90.0	93.4	94.4	17.8
Stroke and transient ischaemic attack	STIA009	% of patients with stroke or TIA who have had influenza immunisation in the preceding 1 August to 31 March Wording change 2013/14	2	55-95	90.0	89.7	93.2	94.0	17.5
Chronic obstructive pulmonary disease	COPD007	% of patients with COPD who have had influenza immunisation in the preceding 1 August to 31 March Wording change 2013/14	6	57-97	93.1	92.7	96.2	96.8	15.8
ACE Inhibitors/angiotensin receptor blockers/beta blockers									
Diabetes	DM006	% of patients with diabetes with a diagnosis of nephropathy (clinical proteinuria) or micro-albuminuria who are currently treated with an ACE-I (or ARBs) Wording change 2013/14	3	57-97	87.4	86.8	91.3	92.6	12.2
Heart failure	HF003	In patients with a current diagnosis of heart failure due to left ventricular systolic dysfunction, % of patients who are currently treated with an ACE-I or ARB Wording change 2013/14	10	60-100	89.3	89.7	99.0	99.2	13.4
Heart failure	HF004	In patients with a current diagnosis of heart failure due to left ventricular systolic dysfunction who are currently treated with an ACE-I or ARB, % patients who are additionally currently treated with a beta-blocker Wording change 2013/14	9	40-65	83.9	86.7	92.1	92.8	17.7
Bone-sparing agents									
Osteoporosis	OST002	% of patients aged 50+ and who have not attained the age of 75, with a fragility fracture on or after 1 April 2012, in whom osteoporosis is confirmed on DXA scan, who are currently treated with an appropriate bone-sparing agent	3	30-60	-	97.1	94.4	92.0	10.0
Osteoporosis	OST005	% of patients aged 75+ with a record of a fragility fracture on or after 1 April 2014 and a diagnosis of osteoporosis, who are currently treated with an appropriate bone-sparing agent. Wording change 2014/15	3	30-60	-	84.4	81.3	92.9	14.7
Statins									
Cardiovascular disease – primary prevention	CVD-PP001	In patients with a new diagnosis of hypertension aged 30-74, recorded between the preceding 1 April to 31 March (excluding those with pre-existing CHD, diabetes, stroke and/or TIA), who have a recorded CVD risk assessment score (using an assessment tool agreed with the NHS CB) of ≥20% in the preceding 12 months: % currently treated with statins	10	40-90	-	-	91.4	96.8	30.0
Cervical screening									
Mental health	MH008	% of women aged 25-64 with schizophrenia, bipolar affective disorder and other psychoses whose notes record that a cervical screening test has been performed in the preceding 5 years Wording change 2013/14	5	45-80	88.0	88.5	89.2	89.2	19.7
Cervical screening	CS002	% of women aged 25-64 whose notes record that a cervical screening test has been performed in the preceding 5 years	11	45-80	82.2	82.0	81.9	81.8	6.3
Smoking cessation									
Smoking	SMOK005	% of patients with any or any combination of the following conditions: CHD, PAD, stroke or TIA, hypertension, diabetes, COPD, CKD, asthma, schizophrenia, bipolar affective disorder or other psychoses who are recorded as current smokers who have a record of an offer of support and treatment within the preceding 12 months	25	56-96	92.9	93.3	94.6	95.5	1.5
Smoking	SMOK004	% of patients aged 15 or over who are recorded as current smokers who have a record of an offer of support and treatment within the preceding 24 months	12	40-90	-	83.1	85.2	86.7	1.1
Contraception									

Disease area	ID	Indicator	Points [†]	Thres-holds (%) [†]	2011/ 12	2012/ 13	2013/ 14	2014/ 15	Excep-tions (%) [†]
Contraception	CON003	% of women, on the register, prescribed emergency hormonal contraception one or more times in the preceding 12 months by the contractor who have received information from the contractor about long acting reversible methods of contraception at the time of or within 1 month of the prescription	3	50-90	91.4	92.2	92.6	92.7	3.7
Structured education									
Diabetes	DM014	% of patients newly diagnosed with diabetes, on the register, in the preceding 1 April to 31 March who have a record of being referred to a structured education programme within 9 months after entry on to the diabetes register	11	40-90	-	-	95.1	90.3	26.6

**% 'underlying achievement' i.e. proportion of eligible patients with a record of this, net of exceptions. †Number of points per practice available, upper and lower thresholds and exception rates 2014/5. Points were rewarded on a sliding scale between a lower and an upper threshold.

Table 1.6: QOF achievement on indicators measuring outcomes (n=11)

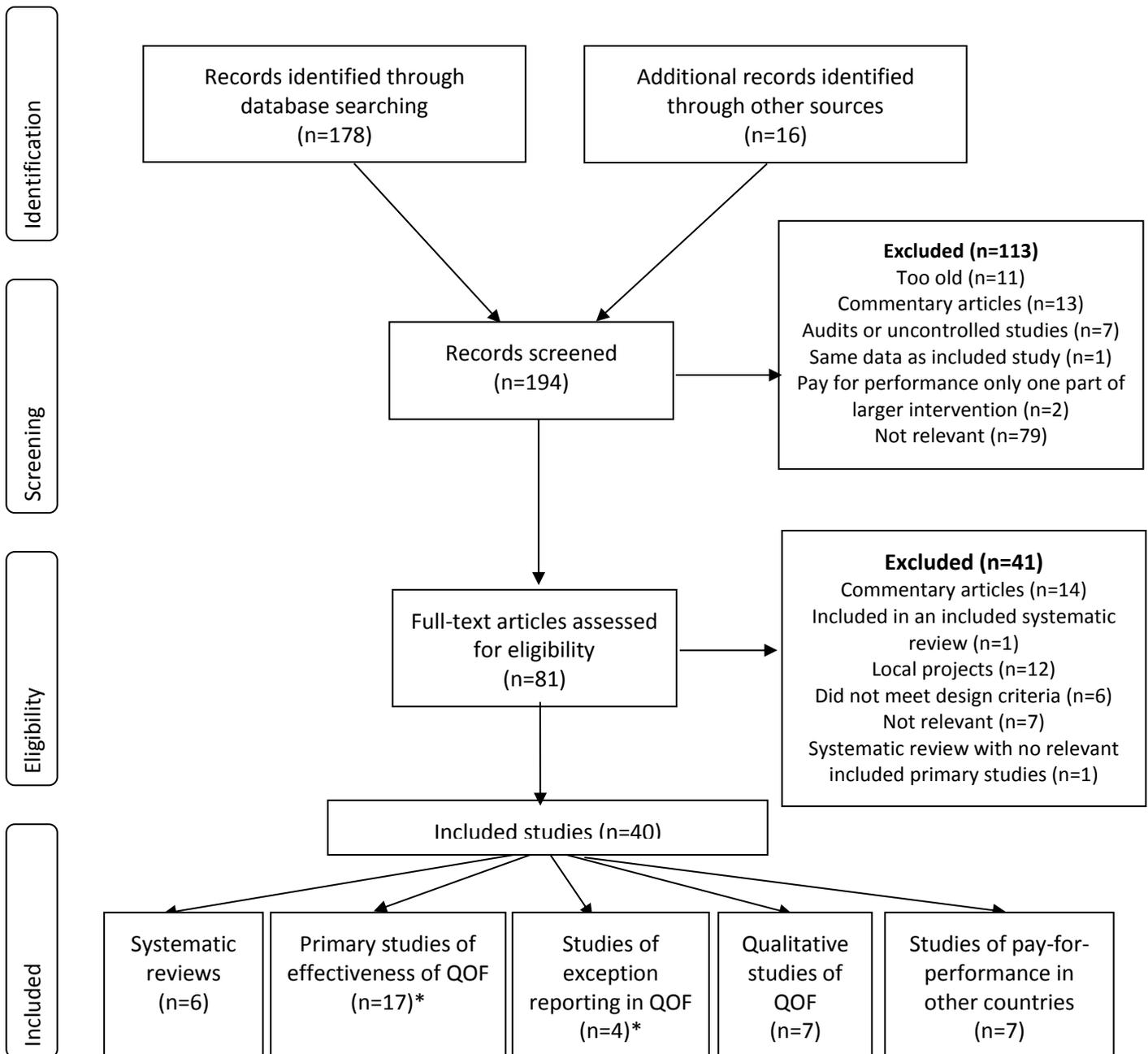
Disease area	ID	Indicator	Points [†]	Thres-holds (%) [†]	2011/1	2012/	2013/	2014/	Excep-tions (%) [†]
					2	13	14	15	
% achievement**									
Blood pressure control									
Hypertension	HYP006	% of patients with hypertension in whom the last blood pressure reading (measured in the preceding 12 months) is 150/90mmHg or less wording change 2014/15	20	45-80	79.7	80.8	83.1	83.6	3.8
Peripheral arterial disease	PAD002	% of patients with peripheral arterial disease in whom the last blood pressure reading (measured in the preceding 12 months) is 150/90mmHg or less, wording change 2013/14	2	40-90	-	89.6	90.3	90.0	4.9
Stroke and transient ischaemic attack	STIA003	% of patients with a history of stroke or TIA in whom the last blood pressure reading (measured in the preceding 12 months) is 150/90mmHg or less wording change 2013/14	5	40-75	88.6	89.3	89.8	88.2	4.4
Coronary heart disease	CHD002	% of patients with coronary heart disease in whom the last blood pressure reading (measured in the preceding 12 months) is 150/90mmHg or less wording change 2013/14	17	53-93	90.1	90.6	92.3	92.0	3.9
Diabetes	DM002	% of patients with diabetes, on the register, in whom the last blood pressure reading (measured in the preceding 12 months) is 150/90mmHg or less wording change 2013/14	8	53-93	89.9	90.4	91.7	91.4	5.2
Diabetes	DM003	% of patients with diabetes, on the register, in whom the last blood pressure reading (measured in the preceding 12 months) is 140/80mmHg or less wording change 2013/14	10	38-78	70.7	72.9	78.5	78.0	8.7
Cholesterol control									
Diabetes	DM004	% of patients with diabetes, on the register, whose last measured total cholesterol (measured within the preceding 12 months) is 5mmol/l or less wording change 2013/14	6	40-75	81.7	81.2	81.6	80.5	12.0
Glycosylated haemoglobin control									
Diabetes	DM007	% of patients with diabetes, on the register, in whom the last IFCC-HbA1c is 59mmol/mol or less in the preceding 12 months wording change 2013/14	17	35-75	69.9	66.5	69.9	69.8	13.5
Diabetes	DM008	% of patients with diabetes, on the register, in whom the last IFCC-HbA1c is 64mmol/mol or less in the preceding 12 months wording change 2013/14	8	43-83	78.7	75.4	77.7	77.5	11.7
Diabetes	DM009	% of patients with diabetes, on the register, in whom the last IFCC-HbA1c is 75mmol/mol or less in the preceding 12 months wording change 2013/14	10	52-92	88.6	86.4	87.1	87.0	8.8
Lithium level control									
Mental health	MH010	% of patients on lithium therapy with a record of lithium levels in the therapeutic range in the preceding 4 months	2	50-90	89.3	88.9	88.9	91.0	9.2

**% 'underlying achievement' i.e. proportion of eligible patients with a record of this, net of exceptions.

†Number of points per practice available, upper and lower thresholds and exception rates 2014/5. Points were rewarded on a sliding scale between a lower and an upper threshold.

Appendix 2 Flow chart of inclusions and exclusions from the review

Adapted from the PRISMA statement 2009⁸²



*One study was a primary research study of effectiveness of QOF that also examined exception reporting

Appendix 3 Tables

Table 3.1. Studies of the QOF included in the five systematic reviews of primary research: overlaps in inclusion

First author, date of publication	Relevant studies included (n)	Relevant studies not included in other reviews (n)	Relevant studies included in other reviews (n)	Overlaps
Rashidian <i>et al</i> , 2015 ³²	2	0	2	2 with Gillam 2 with Houle 1 with Langdown
Hamilton <i>et al</i> , 2013 ³¹	10	1	9	9 with Gillam 2 with Langdown 4 with Houle
Gillam <i>et al</i> , 2012 ²⁹	70	49	21	9 with Langdown 10 with Houle 2 with Rashidian 9 with Hamilton
Langdown <i>et al</i> , 2014 ²⁸	11	0	11	9 with Gillam 2 with Hamilton 1 with Rashidian 4 with Houle
Houle <i>et al</i> , 2012 ³⁰	13	1	12	10 with Gillam 4 with Langdown 2 with Rashidian 4 with Hamilton
All UK studies of QOF included in any of the reviews	74	51	23	

Table 3.2. Cross-sectional studies examining the association between QOF ‘intensity’ as a measure of performance and health or process outcomes

Authors	Year of publication	Units of analysis	Measure of QOF ‘intensity’	Outcomes	Key results
Health outcomes					
Kontopantelis E <i>et al</i> ³⁹	2015	All 32,482 lower level superoutput areas in England	<ul style="list-style-type: none"> Total QOF achievement QOF achievement in all intermediate outcome measures QOF achievement across a subset of intermediate outcomes specific to particular causes of death 	All-cause mortality Mortality from diabetes, heart failure, hypertension, coronary heart disease, stroke and chronic kidney disease	No association between any outcome and measure of QOF intensity
Levene LS <i>et al</i> ⁴⁰	2012	152 primary care trusts across England	<ul style="list-style-type: none"> QOF achievement on % patients with chronic obstructive pulmonary disease immunised against influenza QOF achievement on % patients with hypertension (as measure of detection rather than prevalence) QOF achievement on 2 coronary heart disease indicators (% patients taking aspirin or anticoagulant, % patients with controlled cholesterol level) QOF achievement on 2 stroke indicators (% patients taking aspirin or anticoagulant, % patients with controlled cholesterol level) 	All-cause mortality Mortality from cancer, coronary heart disease, stroke, chronic obstructive pulmonary disease	No association between any outcome and measure of QOF intensity
Bottle A <i>et al</i> ³³	2012	All 139,000 patients with unplanned first time admission for cancer diagnosed in England over 2007/8 to 2009/10	<ul style="list-style-type: none"> Total QOF achievement QOF achievement for 2 cancer indicators (keeping a cancer register, and patient reviews) QOF achievement on 2 access indicators (providing appointment in <48 hours and providing advance booking >2 days ahead) 	First time unplanned admissions for cancer	<ul style="list-style-type: none"> 100 points increase in total QOF achievement associated with lower unplanned admissions OR 0.94, 95% CI 0.91 to 0.97 No association between cancer QOF achievement and unplanned admissions Providing 48 hour appointments associated with lower unplanned admissions OR 0.85, 95% CI 0.79 to 0.92 No association between providing advance booking at unplanned admissions
Brettell R <i>et al</i> ³⁵	2013	8,405 general practices across England	<ul style="list-style-type: none"> QOF achievement for heart failure indicators (% heart failure patients who have had diagnosis confirmed by echo or specialist, and % heart failure patients with appropriate medication) QOF achievement on 2 access indicators (providing appointment in <48 hours and providing advance booking >2 days ahead) 	Emergency admissions for heart failure	<ul style="list-style-type: none"> No association between QOF achievement on heart failure indicators and emergency admission rates Very modest negative association between QOF access indicators and emergency admission rates
Calderon-Larranaga A <i>et al</i> ³⁶	2014	8,622 general practices across England	<ul style="list-style-type: none"> QOF achievement on 2 access indicators (providing appointment in <48 hours and providing advance booking >2 days ahead) QOF achievement on 3 epilepsy indicators (% patients on medication with record of seizure frequency, % patients with medication review, % seizure-free) 	Emergency admissions for epilepsy	<ul style="list-style-type: none"> Very modest association between providing advance booking >2 days ahead and % patients seizure free and emergency admission rates. No association between providing appointment within 48 hours and other two epilepsy indicators

Authors	Year of publication	Units of analysis	Measure of QOF 'intensity'	Outcomes	Key results
Gutacker N <i>et al</i> ³⁷	2015	8,234 general practices across England	<ul style="list-style-type: none"> QOF achievement on 4 mental health indicators (care plans, reviews, % patients on lithium with record of thyroid and renal monitoring, % patients with lithium in therapeutic range) 	Psychiatric admissions	<p>Achievement on 3 of the indicators modestly positively associated with psychiatric admissions</p> <ul style="list-style-type: none"> Care plans – no association Reviews – 1% increase in achievement associated with 0.2% increase in admission rate % patients on lithium with record of thyroid and renal monitoring – 1% increase in achievement associated with 0.2% increase in admission rate % patients with lithium levels in therapeutic range 1% increase in achievement associated with 0.1% increase in admission rate
Kasteridis P <i>et al</i> ³⁸	2015	8,304 general practices across England	<ul style="list-style-type: none"> QOF achievement on the dementia review indicator 	Emergency hospital admissions for dementia	One percentage point increase in QOF dementia indicator achievement associated with modest reduction in emergency admission by 0.1%
Processes of care					
Bang JY <i>et al</i> ³⁴	2012	7,970 general practices across England	<ul style="list-style-type: none"> Total QOF achievement 	Cervical screening coverage	Statistically significant association between QOF achievement and coverage. Size of effect - not possible to judge from report

Table 3.3. Longitudinal studies examining the influence of QOF on trends in health and process outcomes

Authors	Year of publication	Geographical area under study, intervention, period under study	Main outcome	Key results
Health outcomes				
Harrison MJ <i>et al</i> ⁴⁴	2014	England – all English practices Implementation of QOF 2004 Period under study 1998 to 2010	Rates of emergency admissions <ul style="list-style-type: none"> • that can be prevented in the community, divided into those for <ul style="list-style-type: none"> • conditions for which care incentivised in QOF • conditions for which care not incentivised in QOF • that cannot be prevented by good community care 	Emergency admission rates increased by 34% between 1998 and 2010, but rate of increase lower for conditions for conditions for which care incentivised by QOF than other types of emergency admission <ul style="list-style-type: none"> • In 2003, no difference in emergency admission rates between those for conditions for which care is incentivised by QOF and those for which care is not incentivised by QOF. • By 2010, rates of emergency admissions for conditions for which care is incentivised by QOF 8% (95%CI 6.9 to 9.1) lower than those for which care is not incentivised in QOF • By 2010, rates of emergency admissions for conditions for which care is incentivised by QOF 11% (95% CI 10.1 to 11.7) lower than those that cannot be prevented <p>The lower increase in emergency admission rates among those for which care is incentivised by QOF mainly driven by admissions for coronary heart disease.</p>
Ryan <i>et al</i> ⁴⁹	2012	England – all English practices Improvement in QOF achievement over 4 year period (composite scores of processes of care) Period under study 2004 to 2008	Improvement in composite scores of QOF outcomes (e.g. blood pressure, glycosylated haemoglobin, cholesterol)	<ul style="list-style-type: none"> • Diabetes : 10% change in process score associated with 3% change in outcome score • Coronary heart disease : 10% change in process score associated with 4% change in outcome score • Stroke: 10% change in process score associated with 8% change in outcome score • Epilepsy: 10% change in process score associated with 7% change in outcome score • Hypertension : 10% change in process score associated with 7% change in outcome score.
Ryan A <i>et al</i> ⁴⁷	2016	Populations of UK and 27 other high income countries Implementation of QOF 2004 Period under study 1994 to 2010	Mortality from chronic diseases targeted by QOF	<p>Mortality fell in all countries over the period, before and after 2004.</p> <p>QOF not associated with any step change in mortality in the UK.</p> <p>Difference between mortality/100,000 between UK observed and expected 3.7, 95% CI -8.2 to 0.8</p>
Both health and process outcomes				
Kontopantelis E <i>et al</i> ⁴⁵	2013	England – 148 practices across England in General Practice Research Database Implementation of QOF 2004 Period under study 2001 to 2006	Quality of care in type 2 diabetes - composite of achievement of the 17 diabetes QOF indicators including processes and outcomes	<p><u>Pre-intervention 2001-2003</u>: Quality of care improving.</p> <p><u>Post-intervention 2004-2006</u>: Quality of care improved over and above the previous trend. In the first year, 14% improvement in score over and above expected (95%CI 13.7 to 14.6), by third year, 7% improvement in score over and above expected (95%CI 6.7 to 8.0)</p>
Process outcomes				
Arrowsmith ME <i>et al</i> ⁴¹	2014	England – 581 practices across England Implementation of QOF indicator measuring delivery of information about long-acting reversible contraception to women attending for contraceptive advice in 2009 Period under study 2007 to 2012	Prescribing of long acting reversible contraception in England, rate per practice per 1000 women aged 15-44	<p><u>Pre-intervention 2007-2008</u>: Stable rate</p> <p><u>Post-intervention 2009-2012</u>: rate increase of 4% annually (RR=1.04, 95%CI 1.03 to 1.06) sustained for 3 years</p> <p>Increase mainly driven by injectable contraception</p>

Authors	Year of publication	Geographical area under study, intervention, period under study	Main outcome	Key results
Gallagher N <i>et al</i> ⁴²	2015	UK – 516 practices in the General Practice Research Database Implementation of QOF 2004 Period under study 1999 to 2008	% newly diagnosed type 2 diabetes patients prescribed medication within 24 months after diagnosis	<u>Pre-intervention 1999-2003</u> : rate decreased by 1.4% per year (95% CI 0.8 to 2.1) <u>Post-intervention 2004-2008</u> : rate increased by 1.6% per year (95%CI 0.8 to 2.3)
Kontopantelis E <i>et al</i> ⁴⁵	2015	UK – 627 practices across UK in the Clinical Practice Research Datalink Implementation of QOF 2004 Period under study 2000 to 2011	Primary care consultation rates in people with severe mental illness and people without severe mental illness	Mean consultation rates between 2000 and 2011 <ul style="list-style-type: none"> • in severe mental illness - increased from 22 to 49 per year (92% increase after controlling for other factors) • people without severe mental illness - increased from 10 to 19 per year (75% increase after controlling for other factors) For both, trend of increasing rates before 2004. Significant step change increase in 2004 for both groups, which was much bigger for people with severe mental illness. After this, rate of increase declined in both groups. Face-to-face consultation rate <ul style="list-style-type: none"> • in severe mental illness 9 per patient per year 2000-2003, rising to 11 per patient per year in 2011 • in people without severe mental illness was about 5 per patient per year over the whole period.
Kontopantelis E <i>et al</i> ⁴³	2012	England – all English practices Implementation of increase of upper threshold for influenza immunisation for coronary heart disease patients in 2006 (85% to 90%) Period under study 2005-2009	Proportions of patient immunised against influenza among those with <ul style="list-style-type: none"> • coronary heart disease • chronic obstructive pulmonary disease • diabetes • stroke Exception reporting for these	Immunisation rate showed modest increase in coronary heart disease patients in 2006 compared with those for other three conditions (0.41%, 95%CI 0.25 to 0.56). No subsequent increase. Exception rates increased in 2006 for the same indicator compared with the other three indicators by 0.26%, 95%CI 0.12 to 0.40)
Kontopantelis E <i>et al</i> ⁴⁸	2014	England – 644 practices linked to the Clinical Practice Research Datalink Withdrawing indicators for In 2005 <ul style="list-style-type: none"> • influenza immunisation in asthma • record of monitoring of lithium level In 2010 <ul style="list-style-type: none"> • record of blood pressure in diabetes and coronary heart disease • record of total cholesterol in diabetes and coronary heart disease • record of glycosylated haemoglobin in diabetes Period under study 2004 to 2011	Using Clinical Practice Research Datalink, presence of record of: <ul style="list-style-type: none"> • influenza immunisation in asthma • lithium levels • blood pressure in coronary heart disease and diabetes • cholesterol in coronary heart disease and diabetes • glycosylated haemoglobin in diabetes 	Difference between achievement in 2005/6 and 2011/12 <ul style="list-style-type: none"> • Influenza immunisation in asthma -0.7%, 95% CI -1.0 to -0.4 • lithium level recording 0.7%, 95%CI -0.1 to 1.5 Difference between observed and expected achievement in 2011/12 <ul style="list-style-type: none"> • blood pressure recording in coronary heart disease 0.0%, 95%CI -0.2 to 0.2 • blood pressure recording in diabetes 0.0%, 95%CI -0.1 to 0.2 • cholesterol recording in coronary heart disease -1.2%, 95%CI -1.6 to -0.8 • cholesterol recording in diabetes -0.2%, 95%CI -0.4 to 0.0 • glycosylated haemoglobin in diabetes -0.2%, 95%CI -0.3 to 0.0