Institution: University of York		
Unit of Assessment: 2 - Public Health, Health Services and Primary Care		
Title of case study: UK's Quality & Outcomes Framework		
Period when the underpinning research was undertaken: 2005 - 2017		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	**Role(s) (e.g. job title):**	**Period(s) employed by submitting HEI:**
Karl Claxton	Professor	1989 - present
Richard Cookson	Professor	2006 - present
Tim Doran	Professor	2013 - present
Mark Dusheiko	Associate	1999 - 2015
Hugh Gravelle	Professor	1995-2010, 2011 - present
		1999 - present
Rowena Jacobs	Professor	1998 - present
Anne Mason	Senior Research Fellow	2006 - present
Simon Walker	Senior Research Fellow	
Period when the claimed impact occurred: 2013 - 2020		
Is this case study continued from a case study submitted in 2014? N		

1. Summary of the impact (indicative maximum 100 words)

This research programme led to high-level policy change with respect to the remuneration of general practices in England, and to the monitoring and incentivisation of primary care quality. Findings informed the development of the national primary care pay-for-performance scheme – the Quality and Outcomes Framework (QOF) – which directly affects the care of over 23,000,000 patients in the UK. Substantial changes to QOF resulted in the reallocation of over GBP400,000,000 of primary care funding per year by the NHS and the recalibration of national targets for primary care practice performance to more closely match remuneration to quality of care.

2. Underpinning research (indicative maximum 500 words)

Policy context

Over the past two decades, policy makers worldwide have experimented with financial and reputational incentives for healthcare providers in order to improve quality of care. In 2004, the UK's National Health Service (NHS) introduced the Quality and Outcomes Framework (QOF), which increased UK family practice income by up to 25% dependent on performance on 146 quality indicators. The QOF transformed the way practices provided care and measured quality. Over 200 similar schemes have since been implemented in over 40 countries, drawing on the UK's experiences.

Research context

Researchers at York have been at the forefront of international efforts to measure the equity and cost-effectiveness of health service activity and were uniquely placed to assess the impacts of QOF and similar initiatives due to their combination of key skills and interests: i) knowledge of healthcare system organisation, activity and data use; ii) understanding of the behavioural impacts of incentives; iii) econometric methodological expertise (drawing causal inferences from observational data); and iv) maintenance of policy contacts in key governmental departments and agencies. Research teams at York quickly established an international reputation for expertise in this area, leading a series of collaborations with national and international partners. Research programmes have been supported by major funders including the Commonwealth Fund, the English Department of Health, the National Institute for Health Research and the Wellcome Trust, securing over GBP4,000,000 in funding. These programmes have produced over 50 peer-reviewed publications - cited over 2,000 times - and results have been presented to worldwide policy and academic audiences.

Key findings

Prior to 2013, research teams at York focused on measuring practice performance in response to financial and reputational incentives (including unintended behaviours such as mis-reporting), and estimating the cost-effectiveness of incentive schemes. After Doran – who had led some of this work from Manchester – joined York in 2013, research focused on the impact of incentives on patient outcomes, including emergency hospital admissions and mortality.

Financial incentives were found to be effective at improving targeted process of care (**3.1**), although impacts were often difficult to separate from other improvement initiatives, and there were improvements in data recording and teamwork. There were also unintended negative impacts, for example: many patients were inappropriately excluded from the scheme (**3.2**)

- practices frequently mis-reported performance (**3.3**)
- performance for some non-incentivized activities deteriorated relative to incentivized activities (**3.4**)
- continuity of care and patient centeredness declined
- performance gains were lost after incentive withdrawal

Overall, there was little evidence for sustained improved patient outcomes, for example reduced hospital admissions, and only some elements of the scheme were cost-effective (**3.5**). Crucially, QOF did not appear to save lives - mortality rates for QOF conditions did not fall significantly faster than in comparator countries (**3.6**). These findings have informed development of QOF to date and the ongoing research continues to inform the transition of the scheme towards a more outcomes-based framework.

3. References to the research (indicative maximum of six references)

3.1. Doran T*, Fullwood C, **Gravelle H**, Reeves D, Kontopantelis E, Hiroeh U, Roland M. Pay-for-performance programs in family practices in the United Kingdom. *New England Journal of Medicine* 2006; 355: 375-384. DOI:10.1056/NEJMsa055505

3.2. Doran T*, Fullwood C, Reeves D, **Gravelle H**, Roland M. Exclusion of patients from pay-for-performance targets by English physicians. *New England Journal of Medicine* 2008; 359: 274-284. DOI:10.1056/NEJMsa0800310

3.3. Gravelle H, Sutton M, Ma A. Doctor behaviour under a pay for performance contract: treating, cheating and case finding? *The Economic Journal* 2010; 542: F129-F156. DOI:10.1111/j.1468-0297.2009.02340.x

3.4. Harrison M, **Dusheiko M**, Sutton M, **Gravelle H**, **Doran T**, Roland M. Effect of a national primary care pay for performance scheme on emergency hospital admissions for ambulatory care sensitive conditions: controlled longitudinal study. *British Medical Journal* 2014;349:g6423–3. DOI: 10.1136/bmj.g6423 § ¶

3.5. Walker S, **Mason A, Claxton K, Cookson R,** Renwick E, Fleetcroft R. Value for money and the Quality and Outcomes Framework in primary care in the UK NHS. *British Journal of General Practice* 2010;60: e213-e220. DOI: doi.org/10.3399/bjgp10X501859 ¶

3.6. Ryan A, Krinsky S, Kontopantelis E, **Doran T**. Long-term evidence for the effect of pay-for-performance in primary care on mortality in the United Kingdom: a population study. *Lancet* 2016;387. DOI:10.1016/S0140-6736(16)00276-2. § ¶

*Employed at University of Manchester at time of publication, in collaboration with University of York, and employed at University of York from 2013.

§ Returned to REF 2021.

¶ Result of peer-reviewed funding.

All references peer reviewed.

4. Details of the impact (indicative maximum 750 words)

Nature of impact

The research programme has had a major impact on the development of QOF. Changes to QOF are agreed in annual negotiations between the Department of Health (DH) and the British Medical Association (BMA), working on recommendations by the National Institute for Health and Care Excellence (NICE). Since 2009, members of the research team have directly advised NICE, instigating changes to the structure and scope of QOF, including:

- Removal of indicators: performance frameworks cannot cover all clinical areas, and achievement on indicators eventually reaches a point beyond which further improvement is not feasible and a rigorous approach to removal is therefore required. We developed key criteria on which indicator removal decisions were based and 46 indicators, accounting for over GBP403,000,000 in incentive payments, were removed from the programme between 2013 and 2018.
- Adjustment of achievement thresholds: under QOF, payments are scaled between a lower threshold, which sets the minimum level of achievement required, and an upper threshold, which indicates a high level of achievement. We developed a formula to calibrate achievement thresholds against historical performance levels, and this method for setting targets was implemented in 2013/14 for coronary heart disease indicators (**5.1**). This raised upper thresholds, and led to increases in average practice performance, for example: blood pressure and/or cholesterol was controlled for an additional 38,000 patients with coronary heart disease in England following the threshold changes (**5.1**).

Our work continued to inform development of the QOF programme, and in 2017 Tim Doran was appointed to the QOF Review Technical Working Group (**5.2**)**,** which was tasked with conducting a fundamental review of QOF and producing recommendations for reform or replacement of QOF (**5.3, 5.4, 5.5**). The Working Group reported in August 2018, recommending a fundamental restructuring of elements of QOF, including:

- targeting indicators at specific population segments
- introducing a personalised care adjustment to align indicators with clinical decision making and patient choice
- retiring ineffective indicators
- introducing a quality improvement domain to address clinical priority areas (**5.4**).

The review incorporated evidence from research on QOF and other physician incentive schemes conducted by a range of research groups, but most of the key evidence was derived from the work of our group (**3.4**). In the words of the Chair of the Working Group:

“The evidential review was heavily dependent on the research outputs of Professor Doran’s team, and his input to the subsequent working group discussions was instrumental in making the case for substantial changes to the framework, including the removal of ineffective quality indicators and better targeting of remaining indicators to appropriate patient groups.” (**5.3**)

As a direct consequence of the review, several changes were implemented for 2019/20 (**5.6**) representing a major reallocation of NHS resources, including: the retirement of 28 indicators (worth over GBP200,000,000 in incentive payments); the introduction of 15 new indicators (worth over GBP130,000,000) and the introduction of a new Quality Improvement domain (worth over GBP90,000,000).

The research has also achieved impact beyond academic and policy audiences, with national print (**5.7**) and broadcast (**5.8**) media using our research to raise concerns about the limited cost-effectiveness of incentive programmes. Reports of our research highlighting potential negative impacts on unincentivized aspects of care prompted responses from the Chair of the British Medical Association's GP Committee and the Chief Executive of the Patients Association pressing for reform of the incentive programme, (**5.9**) leading the Department of Health and NHS England to undertake the national QOF Review in England (**5.2**). In Scotland, the QOF was discontinued

altogether in 2016.

Innovations
As QOF was implemented simultaneously across all UK practices, precluding the use of randomised trial approaches, a range of novel quasi-experimental study designs (including interrupted time series and synthetic control approaches) were developed to estimate the causal effects of the scheme. A range of novel data linkages were also required for the studies. Our approaches and linkages have subsequently been adopted by other international research groups investigating these issues. This work has also had implications beyond the investigation of incentives, and helped to legitimise the use of quasi-experimental methods in health services research. Research on QOF was also based on novel datasets that were generated to support implementation of the programme, requiring the development of new methods and definitions of quality/performance, and of extensive coding sets to enable interrogation of existing primary care clinical computing databases. The research team created the online Clinical Codes Repository to enable sharing of code lists between research groups, and this now holds 84,049 codes.

5. Sources to corroborate the impact (indicative maximum of 10 references)

5.1. Doran T, Kontopantelis E, Reeves D, Sutton M, Ryan A. Setting performance targets in pay for performance programmes: what can we learn from QOF? *BMJ* 2014*;348*:g1595–g1595. *Account of the process of setting incentive targets and of government and professional responses.*

5.2. Acknowledgement letter from NHSE for work on QOF Review Technical Working Group (3 July, 2018).
Letter from Director of New Business Models and Primary Care Contracts Group, NHS England acknowledging work of TD on the Technical Working Group and explaining contract negotiation process.

5.3. Letter from Chair of QOF Review Technical Working Group *corroborating the impact of Professor Doran's research into quality improvement and physician incentives on national policy and the development of the Quality & Outcomes Framework* (5 February 2021).

5.4. NHS England (2018). Report of the Review of the Quality and Outcomes Framework in England. Available from: https://www.england.nhs.uk/publication/report-of-the-review-of-the-quality-and-outcomes-framework-in-england/
Lacobucci Gareth. Quality and Outcomes Framework faces radical reshape in England but will be retained BMJ 2018; 362:k2946.
Final report of NHS England review of QOF, including overview of evidence and recommendations to contract negotiators. See: Section 3 (Evidence on Current Scheme), especially pp 27-33.

5.5. Forbes L, Marchand C, Peckham S. Review of the Quality and Outcomes Framework in England. Policy Research Unit in Commissioning and the Health Care System; 2016.
*Systematic review of evidence on QOF outcomes commissioned by DH to inform the NHS England review (**5.3**). 10 of 17 included studies were produced by the research team. See: Chapter 3 (Review of Evidence) Tables 3.2, 3.3.*

5.6. NHS England. 2019/20 General Medical Services (GMS) contract Quality and Outcomes Framework (QOF). Available from:https://www.england.nhs.uk/wp-content/uploads/2019/05/gms-contract-qof-guidance-april-2019.pdf
*National guidance for General Medical Services contract in England. Details changes to the national general practice contract in response to the National Review (**5.3**). See:Section 1 (Background)*

5.7. The Times (March 6, 2015). GPs' £1billion Bonus Scheme Fails to cut Death Rates. Available from: https://www.thetimes.co.uk/article/gps-pound1bn-bonus-scheme-fails-to-cut-death-rates-2rs9xxtqb53
*National media report on key paper (Kontopantelis E, Springate DA, Ashworth M, Webb RT, Buchan IE, **Doran T**. Investigating the relationship between quality of primary care and premature mortality in England: a spatial whole-population study. BMJ. 2015;350: h904–h904.) Demonstrating the lack of impact of primary care incentives on patient outcomes.*

5.8. BBC Radio Four (9 Jan, 2018). Too Much Medicine? The Problem of Overtreatment. Available from: https://www.bbc.co.uk/programmes/b091v271
Report on over-medicalisation and the impact of physician incentives on patient outcomes. Major national primary care commentator (Margaret McCartney) interviewing Tim Doran as 'expert witness' on the impact of QOF. See: Discussion of QOF (TD): min 13.32 to 16.16.

5.9. The Telegraph (May 17, 2016). GP 'Bribes' Worsened Death Risks for Some Conditions. Available from: https://www.telegraph.co.uk/news/2016/05/17/gp-bribes-worsened-death-risks-for-some-conditions-lancet-study/
*Report on key paper (**3.6**) highlighting the unintended consequences of incentives for healthcare providers. These and other reports based on the team's researchers helped instigate the national QOF review (**5.2**).*