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Physical health indicators in major mental illness:

analysis of QOF data across UK general practice

Abstract

Background
The Quality and Outcomes Framework (QOF) has specific targets for body mass index (BMI) and blood pressure recording in major mental illness (MMI), diabetes, and chronic kidney disease (CKD). Although aspects of MMI (schizophrenia, bipolar disorder, and related psychoses) are incentivised, barriers to care may occur.

Aim
To compare payment, population achievement, and exception rates for blood pressure and BMI recording in MMI relative to diabetes and CKD across the UK.

Design and setting
Analysis of 2012/2013 QOF data from 9731 UK general practices 2 years after the introduction of the mental health, BMI, and blood pressure QOF indicators.

Method
Payment, exception, and population achievement rates for the MMI and CKD blood pressure indicators and the MMI and diabetes BMI indicators were calculated and compared.

Results
UK payment and population achievement rates for BMI recording for MMI were significantly lower than for diabetes (payment: 92.7% versus 95.5% and population achievement: 84.0% versus 92.5%, $P<0.001$) and exception rates were higher (8.1% versus 2.0%, $P<0.001$). For blood pressure recording, UK payment and population achievement rates were significantly lower for MMI than for CKD (94.1% versus 97.8% and 87.0% versus 97.1%, $P<0.001$), while exception rate was higher (6.5% versus 0.0%, $P<0.001$). This was observed for all countries. Compared with England, Northern Ireland had higher population achievement rates for both mental health indicators, whereas Scotland and Wales had lower rates. There were no cross-jurisdiction differences for CKD and diabetes.

Conclusion
Differences in payment, exception, and population achievement rates for blood pressure and BMI recording for MMI relative to CKD and diabetes were observed across the UK. These findings suggest potential inequalities in the monitoring of physical health in MMI within the UK primary care system.

Keywords
achievement rates; blood pressure; body mass index; chronic kidney disease; diabetes; major mental illness; Quality and Outcomes Framework

INTRODUCTION

The NHS in the UK has undergone significant change since health care was devolved.[1] The General Medical Services Quality and Outcomes Framework (QOF), introduced in 2004, aimed to improve the quality of primary care across the UK.[2,3] Some of the QOF indicators, for example blood pressure and body mass index (BMI) recording, are the same across the UK for different conditions, including major mental illness (MMI), diabetes, and chronic kidney disease (CKD).

Blood pressure and body mass index

Hypertension is an important risk factor for cardiovascular disease and the health benefits gained from successful control are significant.[4] Frequent, accurate recording and monitoring of blood pressure is associated with reductions in systolic and diastolic blood pressure.[5] Blood pressure recording for patients with MMI and CKD has been included in the QOF since 2011 (MMI) and 2006 (CKD) (Table 1). Similarly, BMI recording for diabetes and for MMI is recognised as an important public health issue and has been in the QOF since 2004 (diabetes) and 2011 (MMI) (Table 1).[6–9]

QOF rules and exception recording

While most practices have performed well under the QOF scheme,[10,11] improved patient outcomes have not been consistently observed.[12–14] By financially rewarding practices for meeting a range of indicator targets, there have been concerns that patient care may suffer.[15,16] To safeguard against this, patients can be 'excepted' using agreed criteria (Box 1). If exception rules are applied too readily or inappropriately, high achievement rates may occur and may mask suboptimal care.[17] The Royal College of General Practitioners has highlighted that exception reporting may be disproportionately elevated in those with multiple chronic physical health problems, those living in more deprived areas, and those with mental illness.[18] In general, GPs perceive exception reporting as an important safeguard against overtreatment,[19] and there is no clear evidence that exception reporting is used inappropriately.[20]

Given that the gap in life expectancy between those with and those without MMI may be getting worse,[21–23] and that there are high rates of obesity and poor cardiometabolic health in people with MMI,[24,25] this study sought to compare payment, exception, and population achievement rates for the recording of blood pressure and BMI in individuals with MMI compared with those with diabetes and CKD. These indicators were chosen to allow

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How this fits in

Individuals with major mental illness (MMI; schizophrenia, bipolar disorder, and related psychoses) die on average between 15 and 20 years prematurely, largely as a result of physical health problems. Non-engagement with healthcare services is an issue, although systemic barriers to care may contribute to health inequalities experienced by this group. There is evidence that individuals with MMI receive less screening and fewer preventive interventions than individuals without MMI; however, it is currently unknown if these inequalities occur within the application of the Quality and Outcomes Framework.

direct comparisons between MMI and other chronic diseases across the UK.

METHOD

Exception and achievement rate data for blood pressure recording in those with MMI and CKD, and for BMI recording in those with MMI and diabetes for 2012/2013, were obtained from the Information Services Division of NHS Scotland,[26] the Health and Social Care Information Centre in England,[27] the Department of Health, Social Service and Public Safety in Northern Ireland,[28] and the Welsh Government.[29]

Payment, exception, and population achievement rates were calculated (Figure 1). Achievement and exception rate data were available for 99% of English practices (n = 7938), 97.3% of Scottish practices (n = 969), and 100% of practices in Northern Ireland (n = 353), and Wales (n = 471). For some practices exception data are not available: this may be due to inconsistencies with the data, and their achievement data or their exception data not being definitive.[30] Practices with an indicator denominator <5 were excluded (n = 151).

The percentage of the practice population on each disease register by country was calculated and compared with England as a baseline. For CKD, only those aged >18 years were included and for diabetes only those aged >17 years were included. For both blood pressure and BMI, the mental health indicator was paired by practice to the non-mental health indicator (diabetes or CKD). Median payment, exception, and population achievement rates are reported with interquartile range. Differences in unweighted rates between practices in the same country were tested using a sign test.

Differences in population achievement rate between practices across different countries were compared with England using a quantile regression analysis weighted for practice denominator. All analyses were performed using Stata (version 13). Publicly available practice level data were used and therefore formal ethical approval was not required.

Table 1. Detailed definition of mental health indicators and comparator physical health indicators

Short QOF code	Descriptor of code	2011/ 2012	2012/ 2013	Exception reporting allowed	Comparator QOF	Number of points	Minimum threshold for attainment	Maximum threshold for attainment
MH12[a]	The percentage of patients with schizophrenia, bipolar affective disorder, and other psychoses who have a record of BMI in the preceding 15 months	✓	✓	✓	DM02	4	40	90
DM02	The percentage of patients with diabetes whose notes record BMI in the previous 15 months	✓	✓	✓		1	50	90
MH13	The percentage of patients with schizophrenia, bipolar affective disorder, and other psychoses who have a record of blood pressure in the preceding 15 months	✓	✓	✓	CKD02	4	40	90
CKD02	The percentage of patients on the CKD register whose notes have a record of blood pressure in the previous 15 months	✓	✓	✓		4	50	90

[a]*MH12 is due to be retired from the 2014/2015 QOF in England.*

Box 1. Reasons for exception and exclusion coding

Reason	Detailed explanation
Exclusion	
Definitional	• Where an indicator refers only to patients of a specific age group, with a specific status (such as those who smoke or are on lithium), or with a specific length of diagnosis
Exception[a]	
Informed dissent	• Where a patient does not agree to investigation or treatment (informed dissent), and this has been recorded in their medical records
Unsuitable	• Patients for whom it is not appropriate to review the chronic disease parameters due to particular circumstances for example, terminal illness, extreme frailty • Patients who are on maximum tolerated doses of medication whose levels remain suboptimal • Patients for whom prescribing a medication is not clinically appropriate, such as those who have an allergy • Where a patient has not tolerated medication • Where the patient has a supervening condition which makes treatment of their condition inappropriate, such as cholesterol reduction in liver disease
Registration date and diagnosis date	• Patients newly diagnosed within the practice or who have recently registered with the practice, who should have measurements made within 3 months and delivery of clinical standards within 9 months
Other	• Patients who have been recorded as refusing to attend review who have been invited on at least three occasions during the preceding 12 months (note: considered as informed dissent in Scotland only) • Where an investigative service or secondary care service is unavailable NB: for the mental health register, exception reporting may additionally occur if the individual has an exception code for a similar indicator for another chronic disease; for example, if an individual with diabetes and schizophrenia is excepted from the HbA1c diabetes target indicator, then they too will be excepted from the mental health blood glucose/HbA1c indicator

[a]*Exception reporting is permissible for all clinical indicators except disease registers, the palliative care, and the obesity indicator.*

RESULTS

The percentage of the practice population on each disease register differed across the four countries to a significant extent; with higher prevalence found for mental health problems in Scotland and Wales (0.87% and 0.86%), for diabetes in England (4.83%), and for CKD in Wales (3.58%) (Table 2).

Body mass index recording in MMI versus diabetes

Unweighted indicator payment and population achievement rates for BMI recording in MMI were significantly lower than for diabetes for the UK combined (payment: 92.7% versus 95.5%, $P<0.001$ and population achievement: 84.0% versus 92.5%, $P<0.001$), as well as for each country individually (Table 3). The unweighted exception rate for BMI recording in MMI was significantly higher than for diabetes for the UK combined and for each of the four nations (7.4% versus 2.3% for the UK, 6.5% versus 2.2% in England, 11.8% versus 3.5% in Scotland, 4.3% versus 1.6% in Northern Ireland, and 9.5% versus 3.4% in Wales, all $P<0.001$) (Table 3).

QOF rules and exception recording

Unweighted indicator payment and population achievement rates for blood pressure recording in MMI were also significantly lower than for CKD across the UK combined (payment: 94.1% versus 97.8%, $P<0.001$ and population achievement: 87.0% versus 97.1%, $P<0.001$) and for each country individually (Table 4). As with BMI, the unweighted exception rate for blood pressure recording was significantly higher for MMI compared with CKD for the UK combined and for each of the four nations (6.4% versus 0.3% for the UK, 5.6% versus 0.0% in England, 9.7% versus 0.6% in Scotland, 3.4% versus 1.6% in Northern Ireland, and 7.7% versus 0.4% in Wales, all $P<0.001$) (Table 4).

Differences between countries

Weighted median population achievement rates for BMI and blood pressure recording in those with MMI were significantly lower in Scotland relative to England: −1.5% (99% confidence interval (CI) = −2.7 to −0.3%, and −1.8% (99% CI = −2.7 to −0.9%), $P<0.001$.

Figure 1. Practice payment and population achievement rate calculations.

$$\text{Practice payment/ Indicator achievement rate} = \frac{\text{Number of individuals who have successfully met the indicator criteria (numerator)}}{\text{Number of individuals who could have achieved that indicator target once exclusions and exceptions have been removed (denominator)}}$$

$$\text{Population achievement rate} = \frac{\text{Number of patients who achieved the target (numerator)}}{\text{Number of patients who were eligible for the target with exceptions included (denominator + exceptions)}}$$

Table 2. Percentage of the practice population on the QOF register, with comparison to England in 2012/2013

Indicator	England	Scotland	Northern Ireland	Wales
Mental health				
Raw prevalence (%)	0.84	**0.87**	0.84	**0.86**
Ratio to England	1.00	**1.04**	1.00	**1.02**
Diabetes				
Raw prevalence (%)	4.83	**4.62**	**4.14**	**5.44**
Ratio to England	1.00	**0.96**	**0.86**	**1.13**
Chronic kidney disease				
Raw prevalence (%)	3.36	**3.25**	**3.52**	**3.58**
Ratio to England	1.00	**0.97**	**1.05**	**1.07**

All significant differences in prevalence from England are shown in bold. Register for diabetes is >17 years and CKD is >18 years but prevalence is based on the whole register.

Table 3. Unweighted payment, exception, and population achievement rates for recording of BMI in MMI and diabetes across the UK 2012/2013

Country	Indicator	Payment rate Median (IQR)	Exception rate Median (IQR)	Population achievement rate Median (IQR)
UK (*n* = 9645)	MMI	92.7 (89.3–95.8)	7.4 (3.3–15.9)	84.0 (76.3–90.0)
	Diabetes	95.5 (93.3–97.2)	2.3 (0.9–4.7)	92.5 (89.7–94.9)
England (*n* = 7856)	MMI	92.4 (88.5–95.5)	6.5 (2.2–13.0)	84.0 (76.4–90.0)
	Diabetes	95.4 (93.2–97.1)	2.2 (1.0–4.0)	92.5 (89.8–94.9)
Scotland (*n* = 965)	MMI	94.0 (91.4–97.2)	11.8 (5.4–19.3)	82.2 (74.4–88.9)
	Diabetes	96.3 (94.3–97.8)	3.5 (1.9–6.1)	92.1 (89.4–94.6)
Northern Ireland (*n* = 353)	MMI	93.3 (90.9–95.7)	4.3 (0.0–8.1)	88.0 (84.1–92.7)
	Diabetes	95.2 (93.3–97.1)	1.6 (0.5–3.4)	93.1 (91.2–95.0)
Wales (*n* = 471)	MMI	92.2 (89.8–94.7)	9.5 (4.2–15.4)	82.1 (75.0–88.5)
	Diabetes	95.6 (93.4–97.3)	3.4 (1.8–5.7)	91.8 (88.9–94.0)

All differences between payment, exception, and population achievement rates for MMI versus diabetes for all countries individually and for the UK combined were statistically significant, P<0.001. BMI = body mass index. IQR = interquartile range. MMI = major mental illness.

Rates were also lower in Wales (Table 5). In Northern Ireland, population achievement rates for both MMI indicators were significantly higher relative to England: 2.1% (99% CI = 1.1–3.0) and 2.1% (99% CI = 1.4–2.8%), *P*<0.001 (Table 5). Overall, there was no difference in weighted population achievement rates for BMI recording in diabetes and blood pressure recording in CKD across the UK (Table 4). Although payment rates were consistently higher in Scotland for each of the indicators studied, higher exception rates led to the lower population achievement rates reported in Scotland (Tables 3 and 4).

DISCUSSION

Summary

Although population achievement and exception rates vary by indicator,[31,32] when directly comparing indicators of the same type, higher exception rates and lower payment and population achievement rates were found for BMI and blood pressure recording in MMI compared with diabetes and CKD across the whole of the UK. Population achievement rates for the MMI indicators were also found to be lower in Scotland and Wales but higher in Northern Ireland than in England, although absolute differences were small.

To the authors' knowledge, this is the first study to directly compare measurement indicator population achievement rates for different chronic diseases across the whole of the UK. The clinical, societal, and financial implications of undetected raised BMI and blood pressure are likely to be significant, especially for individuals with MMI.

Strengths and limitations

To the authors' knowledge, this is the first study to directly compare payment, exception, and population achievement rates for individual mental health indicators with other individual chronic disease indicators across the whole of the UK and between nations. The national scope and the high level of uptake of the QOF within UK practices contributes to the strengths of the study, but some limitations are acknowledged. First, QOF data is a payment rather than quality monitoring system and was obtained at a practice; rather than patient-level basis, meaning patient-level case mix adjustment was not possible. Given that individuals with MMI are more likely to have physical health problems,[33] it was not possible to assess the effect of multimorbidity on payment, achievement, and exception rates. As individual patients can appear in more than one chronic disease indicator denominator, it was not possible to determine the level of patient overlap between the chronic diseases investigated. This could only be studied by detailed auditing within practices. Exception

Table 4. Unweighted payment, exception and population achievement rates for recording of BP in MMI and CKD across the UK 2012/2013

Country	Indicator	Payment rate Median (IQR)	Exception rate Median (IQR)	Population achievement rate Median (IQR)
UK (*n* = 9725)	MMI	94.1 (90.9–97.1)	6.4 (3.0–13.1)	87.0 (81.3–91.7)
	CKD	97.8 (96.3–98.9)	0.3 (0.0–1.0)	97.1 (95.5–98.4)
England (*n* = 7942)	MMI	93.8 (90.5–96.8)	5.6 (1.7–10.6)	87.0 (81.3–91.7)
	CKD	97.7 (96.2–98.9)	0.0 (0.0–0.8)	97.2 (95.5–98.4)
Scotland (*n* = 962)	MMI	95.9 (93.1–100.0)	9.7 (4.4–15.7)	85.7 (80.0–91.2)
	CKD	98.4 (97.0–99.5)	0.6 (0.0–1.7)	97.2 (95.6–98.6)
Northern Ireland (*n* = 353)	MMI	94.9 (92.4–97.5)	3.4 (0.0–6.9)	91.1 (86.7–94.3)
	CKD	97.9 (96.5–99.0)	1.6 (0.5–3.4)	97.4 (96.2–98.9)
Wales (*n* = 468)	MMI	94.0 (91.1–97.2)	7.7 (3.5–13.2)	85.5 (80.4–90.0)
	CKD	97.8 (96.3–98.8)	0.4 (0.0–1.2)	97.0 (95.4–98.2)

All differences between payment, exception, and population achievement rates for MMI versus CKD for all countries individually and UK combined, were statistically significant, P<0.001. BP = blood pressure. CKD = chronic kidney disease. IQR = interquartile range. MMI = major mental illness.

Table 5. Weighted median population achievement rate percentage point difference from England by indicator for 2012/2013 with 99% confidence intervals weighted by practice denominator

Measurement	England	Scotland	Northern Ireland	Wales
BMI recording				
Mental health (MH12), % difference (99% CI)	82.9 (76.0–88.5)	**–1.5 (–2.7 to –0.3) *P*<0.001**	**2.1 (1.1 to 3.0) *P*<0.001**	**–0.5 (–1.0 to –0.01) *P* = 0.025**
Diabetes (DM02), % difference (99% CI)	92.2 (89.6–94.5)	**–0.5 (–1.0 to –0.05) *P* = 0.004**	0.3 (–0.1 to 0.7) *P* = 0.028	**–0.2 (–0.4 to –0.04) *P* = 0.002**
BP recording				
Mental health (MH13), % difference (99% CI)	86.1 (81.0–90.3)	**–1.8 (–2.7 to –0.9) *P*<0.001**	**2.1 (1.4 to 2.8) *P*<0.001**	–0.4 (–0.7 to 0.01) *P* = 0.013
CKD (CKD02), % difference (99% CI)	97.0 (95.4–98.1)	0.02 (–0.2 to 0.3) *P* = 0.797	0.2 (0.01 to 0.4) *P* = 0.012	–0.07 (–0.17 to 0.03) *P* = 0.058

All significant differences in percentage point from England are shown in bold. BMI = body mass index. BP = blood pressure. CKD = chronic kidney disease.

reporting is under individual practice control and so variation in practice policy, both locally and between countries, may occur. Differences in practice performance are associated with choice of clinical computing system,[34] and given that data were obtained from the whole of the UK, variation in clinical computing software likely occurred and may be a confounder. While data from one contractual year have been presented, further longitudinal work is required to determine whether these patterns are sustained over a prolonged period and represents a further limitation to the work of this study.

Comparison with existing literature

Ten years after the introduction of the QOF, very few studies have compared indicator achievement rates across different countries within the UK. Cross-jurisdiction comparisons are helpful to determine possible trends, potential areas of concern, and differences in practice that might occur across UK primary care.[30]

The findings of higher population achievement rates in Northern Ireland and lower population achievement rates in Wales relative to England have been reported elsewhere, namely, for mean population achievement rates for intermediate outcomes and treatment indicators in coronary heart disease, stroke, hypertension, and diabetes.[35]

Reasons for higher population achievement rates in Northern Ireland may include greater health and population stability or a younger population than in the rest of the UK.[36] Differences in prevalence across the four nations may also have influenced achievement rates.

The finding of lower population achievement rates due to higher exception rates for BMI recording in MMI relative to diabetes are of concern, as BMI recording and monitoring is important for health promotion and is recommended in the National Institute for Health and Care Excellence (NICE) guideline on obesity.[37] Given the move towards primary prevention, recording of BMI in 82% of patients with MMI in Scotland and Wales suggests that while most patients are receiving QOF-level care, there is room for improvement. Whether this improvement is possible, given that the onus is on patients to attend their practice, is unclear and warrants further investigation. Reasons for lower achievement rates for MMI likely include both patient and practice factors. The QOF does not incentivise home visits and so, if patients do not attend, they are more likely to be excepted, and it is well recognised that individuals who are housebound have higher rates of mental illness.[38]

Although obesity is recognised as a major public health problem, there are many

barriers to its management, including lack of motivation on the patient's part,[39] and practice-level factors, such as GPs or practice nurses perceiving a lack of training in obesity management.[35] Given the high rates of obesity within the UK, and the particularly high rates in people with MMI,[22] the planned retirement of the BMI indicator for the 2014/2015 QOF in England[40] is concerning because opportunities to intervene and improve the physical health of individuals with MMI may be lost.

Significantly lower population achievement rates were found for blood pressure recording in MMI relative to CKD. While it is unclear what proportion of patients had normal or elevated blood pressure, it is recognised that frequent, accurate recording and monitoring of blood pressure is associated with reductions in systolic and diastolic blood pressure and therefore better control.[5] Blood pressure monitoring while on antipsychotic medication has also been recommended in the NICE guidelines on schizophrenia since 2009.[41,42]

Although the drive towards a more integrated approach to the management of the physical health of those with MMI has been relatively recent,[43,44] the evidence for poor cardiometabolic health in this cohort has been clear since the late 1990s and early 2000s,[45,46] and is reflected within all clinical guidelines over the past 5 years.

Other factors may contribute to the lower payment and population achievement rates observed for patients with MMI. First, the mental health BMI and blood pressure indicators were introduced in 2011/2012, while the BMI indicator for diabetes has existed since 2004/2005 and, similarly, the blood pressure indicator for CKD was introduced in 2006/2007. It is recognised that indicator payment rates improve with time and then plateau,[47] and so this disparity may contribute to the differences observed. Furthermore, blood pressure and BMI recording have long been recognised as important in the management of CKD and diabetes, but are relatively new for MMI. GPs may also regard blood pressure measurement inappropriate for younger patients with MMI because of uncertainty around therapeutic options.

Further possible explanations for the findings might include stigma associated with mental illness, as well as the perceived separation of physical and mental health care by the patient, their carer, GPs, and psychiatrists. Although individuals with MMI have more physical health problems than the general population,[48,49] inequalities are persistently reported for both the access to, and the quality of, a range of physical healthcare services.[50–53] While payment rates across the indicators were similar, exception rates for the MMI indicators were markedly higher than for those in patients with diabetes and CKD. This suggests that although practices may be attempting to engage individuals, the QOF may not provide the flexibility needed to overcome non-engagement for patients with MMI, leading to higher exception rates.

Implications for research and practice

Evidence of lower payment, higher exception, and lower population achievement rates were found for BMI and blood pressure recording in MMI relative to diabetes and CKD throughout the whole of the UK. Variation in payment, exception, and population achievement rates were also found between countries. It is likely that this is multifactorial, reflecting a combination of patient, clinician, and wider organisational factors. However, these findings suggest possible inequality in access to certain aspects of health care for patients with MMI: as demonstrated by inequality in access to QOF recording of BMI and blood pressure. Further investigation, for example, through detailed auditing of patient level data, is needed.

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Publicly available practice level data were used and formal ethical approval was therefore not required.

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Competing interests

The authors have declared no competing interests.

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