

Population Intermediate Outcomes of Diabetes Under Pay-for-Performance Incentives in England From 2004 to 2008

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OBJECTIVE — To evaluate diabetes outcomes under a national “pay-for-performance” program.

RESEARCH DESIGN AND METHODS — Data were analyzed for 98% of all English family practices. For each practice, the proportion of diabetic subjects with A1C $\leq 7.5\%$, blood pressure $\leq 145/85$ mmHg, and cholesterol ≤ 5 mmol/l was determined. Practices achieving less than the 25th centile for the A1C target for 2006–2007 were classified as low performing.

RESULTS — The proportion achieving the A1C target at the median practice increased from 59.1% (interquartile range [IQR] 51.7–65.9) in 2004–2005 to 66.7% (IQR 60.6–72.7) in 2007–2008, blood pressure from 70.9% in 2004–2005 to 80.2% in 2007–2008, and cholesterol from 72.6% in 2004–2005 to 83.6% in 2007–2008. In 2004–2005, 57% of practices were low performing (range by region 42.4–69.9). In 2007–2008, 26% of practices were low performing (range 11.6–37.5).

CONCLUSIONS — Introduction of pay-for-performance may be one factor contributing to increasing achievement of targets and reducing problems of low performance.

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In England, a novel system of contractual financial incentives, called the Quality and Outcomes Framework (QOF), has been introduced to reward family practices for achieving clinical targets across a range of conditions, including diabetes (1). Up to one-third of practice income may be derived from the QOF, with diabetes accounting for nearly 10% of all incentives. Data are extracted from general practice computer systems on 31 March each year, and the most recent diabetes indicator measures are used to evaluate targets (2). We aimed to evaluate trends in the achievement of intermediate outcome targets following the introduction of pay-for-performance in 2004.

RESEARCH DESIGN AND

METHODS — Administrative QOF data describing performance of family

practices under the program were analyzed for the years 2004–2008 (3). Data for each family practice included the number of registered diabetic subjects, the proportion of eligible subjects who achieved the targets, and the proportion of diabetic subjects excluded from evaluation of each target as “exceptions.” Exceptions arise because practices are permitted to identify some individuals as ineligible for evaluation if the target is regarded as clinically inappropriate (4). The targets included in this report were the percent of diabetic subjects with the last A1C $\leq 7.5\%$, with last blood pressure $\leq 145/85$ mmHg, or with the last measured total cholesterol ≤ 5 mmol/l. We estimated the total number of registered diabetic subjects, the total number excluded as ineligible, and the number (and percent) of subjects who achieved the target after allowing for exclusions. The lin-

ear association between outcomes and year was estimated using robust standard errors to allow for repeated measures.

RESULTS — Data were analyzed for family practices in England that remained independent and had more than 750 registered patients or more than 500 patients per doctor, in the study year. Data were analyzed for 8,423 practices in 2004–2005, 8,264 in 2005–2006, 8,192 in 2006–2007, and 8,255 in 2007–2008, representing $\sim 98\%$ of all practices. The median number of registered diabetic subjects per practice increased from 181 (interquartile range [IQR] 107–284) in 2004–2005 to 218 (IQR 130–342) in 2007–2008 (Table 1). The total registered diabetic population increased from 1,764,063 in 2004–2005 to 2,087,487 in 2007–2008. The estimated resident population of England is ~ 51 million (5), giving an overall prevalence of $\sim 4\%$. The median practice-specific proportion of diabetic subjects declared ineligible for the A1C target was 9.4% in 2004–2005 but declined to 8.7% in 2007–2008 ($P < 0.001$). The median proportion excluded for the blood pressure target was 6.3% in 2004–2005 declining to 5.7% in 2007–2008 ($P < 0.001$) and for cholesterol was 9.0% in 2004–2005 declining to 8.4% in 2007–2008 ($P < 0.001$).

The median practice-specific proportion achieving the A1C target of $\leq 7.5\%$ increased from 59.1% in 2004–2005 to 66.7% in 2007–2008 (Table 1). The proportion achieving the blood pressure target of $\leq 145/85$ mmHg increased from 70.9% in 2004–2005 to 80.2% in 2007–2008. The proportion achieving the cholesterol target of ≤ 5 mmol/l increased from 72.6% in 2004–2005 to 83.6% in 2007–2008. The estimated annual increase in percent of diabetes subjects achieving targets was 3.03% (95% CI 2.95–3.10; $P < 0.001$) for the A1C target, 3.26% (3.18–3.34; $P < 0.001$) for the blood pressure target, and 3.99% (3.92–4.07; $P < 0.001$) for the cholesterol target.

The total number of diabetic subjects in England achieving the A1C target, after allowing for exclusions from assessment,

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Table 1—Centiles for the achievement of intermediate outcome targets for English family practices by year

		Centiles of distribution for English family practices					N and n (% year total)
		1%	25%	Median	75%	99%	
Count of registered diabetic patients*	2004–2005	29	107	181	284	601	1,764,063
	2005–2006	36	118	196	307	650	1,877,748
	2006–2007	34	121	205	322	689	1,944,006
	2007–2008	39	130	218	342	730	2,087,487
Excluded from A1C target as exceptions†	2004–2005	0	6.3	9.4	14.5	47.4	194,226 (11.0)
	2005–2006	0.9	6.6	10.0	15.2	44.5	216,200 (11.5)
	2006–2007	1.5	6.6	9.9	15.1	43.5	225,205 (11.6)
	2007–2008	1.1	5.7	8.7	13.1	36.1	209,090 (10.0)
Achieving A1C ≤7.5%‡	2004–2005	28.0	51.7	59.1	65.9	89.7	845,522 (48.0)‡
	2005–2006	34.5	55.1	61.7	68.5	88.9	946,455 (50.4)‡
	2006–2007	42.7	61.1	67.6	74.3	95.6	1,094,684 (56.3)‡
	2007–2008	43.1	60.6	66.7	72.7	88.5	1,186,695 (57.0)‡
Achieving blood pressure ≤145/85 mmHg‡	2004–2005	41.5	63.4	70.9	78.1	94.6	1,064,995 (60.0)‡
	2005–2006	49.3	68.8	75.7	81.9	95.4	1,218,981 (64.9)‡
	2006–2007	56.0	73.5	79.6	85.3	98.6	1,382,037 (71.1)‡
	2007–2008	58.8	74.5	80.2	85.4	96.6	1,518,780 (73.0)‡
Achieving cholesterol ≤5.0 mmol/l‡	2004–2005	38.7	64.7	72.6	79.3	93.5	1,092,954 (62.0)‡
	2005–2006	52.2	73.5	79.8	84.9	95.8	1,297,068 (69.1)‡
	2006–2007	61.1	78.8	83.7	88.0	98.5	1,421,629 (73.1)‡
	2007–2008	63.8	79.4	83.6	87.5	96.0	1,545,301 (74.0)‡

Data are percents of registered diabetic subjects at each practice except where indicated. N, total number of diabetic subjects across all practices; n, total number with trait across all practices. *Data are frequencies; †data are practice-specific percents of eligible diabetic subjects; ‡subjects excluded through “exception reporting” were assumed not to have achieved target.

increased by 341,173 between 2004–2005 and 2007–2008, representing 16% of diabetic subjects registered in 2007–2008. Over the same period, the number achieving the blood pressure target increased by 453,785 (22% of 2007–2008 registrations), and the number achieving the cholesterol target increased by 452,347 (22% of 2007–2008 registrations).

Practices were classified as low performing if they achieved less than the 25th centile for the A1C target across all practices in 2006–2007. There were 57% of practices classified as low performing in 2004–2005. Among the 10 English regions, 69.9% of practices were low performing in London compared with 42.4% in the North West region. The overall proportion of low-performing practices declined to 47.4% in 2005–2006, 25.0% in 2006–2007, and 26.0% in 2007–2008. In 2007–2008, the proportion of low-performing practices ranged from 37.5% in London to 11.6% in the North East.

CONCLUSIONS— In the U.K., the care of subjects with type 2 diabetes is increasingly undertaken outside of specialist clinics by family physicians and

practice nurses in primary care. This has led to concerns that some patients may experience poor-quality care (6). The new national contract for family practices introduced in 2004 appears to have achieved favorable results in its initial year (4,7) and may have contributed to reducing socioeconomic inequalities in care (8,9).

The overall level of achievement of diabetes targets increased over 4 years. Lower-performing practices have shown the greatest improvements, and regional variations in care have reduced. There has been a substantial increase in the proportion of all diabetic subjects achieving intermediate outcome targets. In our previous report (7), we analyzed clinical data from individual patient records for 26 practices during the period of 2000–2003 that gave results consistent with administrative data from the QOF. Two other reports, including data from the first or second years of QOF, suggest that QOF data are consistent with audits of individual patient records (10,11).

In a single group study, without any control practices, it is not possible to conclude that pay-for-performance incentives caused the observed changes. Other

development efforts may have been influential. There was already evidence of improving quality of care before the introduction of QOF (7,12). The QOF targets are designed for audit rather than best practice, and practitioners may be utilizing clinical practice guidelines that recommend more stringent targets. Recommendations for a widespread use of statins were introduced in many countries at the start of this period, leading to improvements even in the absence of pay-for-performance. The greater improvement of low-performing practices may, in part, be accounted for by a ceiling effect, which restricted the potential improvement in high-performing practices. We caution that it is not clear that proposed benefits from pay-for-performance would be observed if this model is adopted in systems with different organizational arrangements and models of practitioner remuneration.

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