Reduced mortality with Hospital Pay for Performance in England

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Payment reform: Moving beyond Payment by Results

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Pay-for-Performance

- Health care commissioners can pay providers on the basis of:
  - an agreed service specification
  - population coverage (capitation)
  - volume
  - performance

- Internationally, more third-party payers are linking a proportion of provider revenue to achievement of quality indicators

- Examples in England: the *Quality and Outcomes Framework*, *Best Practice Tariffs*, and the *Commissioning for Quality and Innovation* framework

P4P and health outcomes

- Increased adoption of P4P is occurring despite a scant evidence base
  - by 2009, few schemes had been evaluated at all
  - evaluations show at best modest and temporary effects on quality
  - recent Cochrane review (Flodgren, 2011) found no evidence that financial incentives lead to improvements in health outcomes

- More inclusive review (van Herck, BMCHSR, 2010) highlighted that several aspects of P4P may be important:
  - the design of schemes
  - their mode of implementation
  - the context in which they are introduced

Advancing Quality

- First hospital P4P scheme to be introduced in the UK (October 2008)
- Based on Hospital Quality Incentive Demonstration (HQID) from the US
- Adopted by all 24 NHS Acute Trusts in the North West SHA
- Covered five patient groups: pneumonia, CABG, AMI, heart failure, hip/knee
- Performance on 28 quality indicators was reported by participating Trusts
  - collected and fed back quarterly and published annually
- Tournament scheme (for first 12 months)
  - top 6 Trusts received a 4% bonus on their tariff payments
  - next 6 Trusts received a 2% bonus on their tariff payments
- Bonuses allocated internally to clinical teams for investment in care

Our evaluation

- Independent evaluation funded by the NIHR Health Services & Delivery Research Programme
- Collaboration between Universities of Nottingham, Manchester, Cambridge and Birmingham
- Five-year study: April 2009 – March 2014
- Combination of qualitative and quantitative research

Estimation of effect on mortality

- Data from national Hospital Episode Statistics
- Deaths within 30 days of admission (in any hospital in England)
- For patients admitted for:
  - three incentivised conditions (AMI, heart failure and pneumonia)
  - six reference conditions
- Periods: 18 months before and first 18 months after introduction
- Comparison of 24 North West Trusts with 132 Trusts in rest of England
- Risk-adjustment using age and sex, primary diagnosis, 31 co-existing conditions, type of admission, residential location on admission

Changes in unadjusted mortality rates

	North West			Rest of England		
	Before	After	Change	Before	After	Change
AMI	12.4	11.0	-1.4	11.0	10.7	-0.3
Heart failure	17.9	16.6	-1.3	16.6	16.1	-0.6
Pneumonia	28.0	25.9	-2.2	27.2	26.3	-0.9
Reference conditions	13.3	13.0	-0.3	11.7	11.0	-0.7

Mortality measured in percentage points.

Difference-in-differences analyses of adjusted mortality

Health condition	Between-Region Difference in Differences	Triple Difference
Reference conditions	0.3 (-0.4 to 1.1)	-
Incentivised conditions	-0.9 (-1.4 to -0.4)	-1.3 (-2.1 to -0.4)
AMI	-0.3 (-1.0 to 0.4)	-0.6 (-1.7 to 0.4)
Heart failure	-0.3 (-1.2 to 0.6)	-0.6 (-1.8 to 0.6)
Pneumonia	-1.6 (-2.4 to -0.8)	-1.9 (-3.0 to -0.9)

Mortality measured in percentage points (95% CI).

Headline results

- There was a larger overall reduction in mortality of 1.3 percentage points in the North West when the P4P was introduced
- Relative rate reduction of 6%
- Over 18 months, equates to a reduction of 890 deaths (95% CI, 260 to 1500) amongst population of 70,644 patients with these conditions

Further analyses

- No significant differences in proportions of patients discharged to institutions
- Trends in mortality were similar in the North West to the rest of England before introduction of the scheme
- Results unaffected by controlling for baseline mortality and changes in patient volumes
- Similar results when exclude the south of England
- Largest reductions in mortality achieved in small Trusts and Trusts rated “excellent” or “good” by CQC
- Cost-effectiveness
  - scheme cost £13M to set-up, administer and provide bonuses
  - estimated to have generated over 3,000 Quality-Adjusted Life Years
  - cost-per-QALY well below NICE threshold

How and why?

- Results differ from those found for HQID in the US
- Not feasible that the mortality reductions were only due to improvements on the incentivised process measures

- Providers adopted range of quality improvement strategies
- Identification and targeting of particular patient groups
- Principal differences from US scheme
  - Universal participation
  - Size of bonus
  - Probability of bonus
  - Regional collaboration

Implications

- NB. have only considered first 18 months of scheme
- Pay-for-Performance can be associated with substantial mortality reductions
- Financial incentive not as high-powered as QOF, BPTs, CQUIN
- AQ is a P4P programme:
  - regional initiative
  - new data collection and public reporting
  - bonuses to clinical teams

Concluding remarks

- NW SHA imported a P4P scheme from the US from October 2008
- Translated to NHS context – universal participation, regional collaboration
- Associated with a substantial reduction in mortality
- Cost-effective use of resources in first 18 months
- Not just direct result of improvements in the incentivised measures
- A quality improvement programme supported by financial incentives
- Differs in some potentially important ways from other P4P initiatives adopted in the NHS

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Incentivised process quality measures

- **Acute Myocardial Infarction**
  - Aspirin at arrival
  - Aspirin prescribed at discharge
  - ACEI or ARB for LVSD
  - Smoking cessation advice / counselling
  - Beta blocker prescribed at discharge
  - Fibrinolytic therapy within 30 minutes of arrival
- **Heart Failure**
  - Evaluation of LVS Function
  - ACEI or ARB for LVSD
  - Discharge instructions
  - Smoking cessation advice/counselling
- **Pneumonia**
  - Oxygenation assessment
  - Initial antibiotic selection in immunocompetent patients
  - Blood cultures performed prior to initial antibiotic selection
  - Initial antibiotic received within 6 hours of hospital arrival
  - Smoking cessation advice / counselling