

Help from **HCAF** to achieve the World Class Commissioning Core Competencies

Healthcare Analysis & Forecasting has been providing consultancy to healthcare providers for over fifteen years. In the six years to March 2008 HCAF had delivered 8,250 direct project hours with NHS clients.

HCAF has specialist knowledge and skills in Competencies five to ten.

Competency 5: Knowledge & Needs Assessment

HCAF has acquired significant expertise in the area of benchmarking, needs assessment and population segmentation. Research has shown that the Index of Multiple Deprivation (IMD) is one of the most powerful predictors of need and unmet need. When combined with the output area classification (OAC) this delivers a powerful tool for social marketing.

HCAF have developed a unique method which allows IMD to be assigned at output area level (300 head of population). IMD combined with ethnicity, education and other specific indicators such as those contained in the output area classification can be used to create tailored benchmark and social marketing groups at output area rather than cruder local authority level comparisons. Forecasts of demand for individual procedures are prepared using age, sex, IMD, ethnicity, students, etc as input variables.

HCAF has developed a sophisticated model which adjusts for age, deprivation (IMD), ethnicity and students to give expected levels of activity for each HRG or specialty at small area level (around 300 head of population). Each small area will belong to a PCT or lie within the catchment of an acute hospital. Excess levels of activity; due to the way the hospital counts activity; to excess surgical intervention rates or to excess outpatient referral can be identified and action taken to address the root causes.

During the last 15 years HCAF has developed an extensive reference library of healthcare statistics which can be used to estimate demand for aspects of healthcare such as diagnostic tests, use of community hospitals, and hourly demand for A&E and to benchmark healthcare activities.

Competency 6: Prioritise Investment

HCAF uses proven statistical methods to detect extremes of performance or intervention levels. Actuarial analysis (using specialist software) of financial and activity forecasts reveals best and worst case scenarios along with the probability of success or failure. Sensitivity analysis of the assumptions behind business cases allows better evaluation of return on investment decisions. This method attaches a likely range and statistical signature for all assumptions in a business case and allows

all assumptions to simultaneously vary. The output of this simulation gives the likely probability that the so-called preferred option will succeed or fail.

Predictive models can be constructed utilizing the tools employed for competency five. A geo-demographic model predicts likely flows to any site (new or established) in the face of competition from other (new or proposed) sites. It can be used by a PCT to modify existing contract volumes. The method can also calculate the optimum and feasible sites for a new facility.

HCAF is the leading source of actuarial analysis of PCT/PBC financial risk which will allow a PCT to evaluate how to minimize risk using risk pools, set trigger points to activate contingency plans or to establish inter-PCT financial risk instruments.

Competency 7: Stimulate the Market to Meet Demand

HCAF has expertise in the analysis and interpretation of reference costs, marginal costs, economy of scale, apportionment & capital structures and can evaluate the cost effectiveness of proposed new entrants.

A unique tool for optimization of bed pools allows provider performance & capability to be extended. Tools are available to detect changes in demand and to enable providers to effectively meet the seasonal demand patterns behind all disease conditions.

HCAF has considerable expertise in locating those HRG which are susceptible to manipulation and gaming leading to higher costs to the PCT.

A sophisticated geo-demographic tool allows forecasts of patient flows to proposed new points of delivery in a patient choice environment. The same tool can be used to optimize the location of a new facility for service delivery.

Competency 8: Continuous Improvement

HCAF uses statistical tools to investigate shifts in spending and intervention levels. Upper- and lower-control limits for spending trajectories enable managers to focus on statistically significant performance deviations.

Competency 9: Procurement Skills

HCAF has proven skills in demand forecasting including seasonal patterns of demand. Monthly demand forecasts along with upper and lower limits protect the PCT from performance contracts which favour the provider and not the purchaser.

Different proposed locations for new points of service provision can be evaluated to ensure that patient flows in a patient choice environment will support the proposed level of capacity. This is combined with considerable expertise in the cost of procedures as influenced by economy of scale, population age structure, etc.

HCAF has developed leading edge experience in the area of the cost of NHS procedures which goes beyond the traditional HRGs.

Competency 10: Manage Systems & Providers

The statistical signature behind variation in demand is used to enable managers to explore the capacity implications of short waiting times. Such short waiting times have an implied excess capacity (or increased flexibility) required to avoid any patient breaching the maximum wait. The implied excess capacity is much higher than most NHS managers realize and the necessary steps can be explored ahead of time rather than fire fighting after the event.

A novel adaptation of the Erlang equation gives exceedingly accurate values for the size of the bed pools in an acute hospital. This is the only method available which allocates the correct occupancy level to bed pools of different sizes. Future reductions in length of stay or the movement of blocks of bed days to alternative settings are easily handled to give a revised bed pool size. The method has been used to set ring-fenced surgical bed pools in a Foundation Trust and to predict relative costs and bed requirements for maternity departments. A further tool is available to optimize the allocation of beds around the highly seasonal pattern in medical bed demand.

Knowledge of the inherent uncertainty in demand can be used to inform the type of contract to be placed with a foundation trust. Such a contract will include upper and lower intervals within which activity is allowed to fluctuate. Exception reporting can then concentrate on those areas where activity deviation is statistically significant.

A method which uses pattern recognition to forecast year end out-turn (activity and cost) from a mid year position. Upper and lower control limits allow managers to take action where it is appropriate and allow the Board of Directors to exercise due diligence regarding financial break-even.

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Dr Rod Jones (ACMA) **Statistical Advisor**

Rod has a Ph.D. in Chemical Engineering; is a chartered accountant and has completed the Hewlett Packard course in Total Quality Management. His career prior to the NHS covers 7 years in academia (Biochemical Engineering) and 10 years in industry as a group process development engineer for blue-chip fmcg plc's and as general manager for an international laboratory proficiency testing organisation.

He has over 15 years experience in healthcare (commencing as Assistant Director of Information at the Royal Berkshire Hospital) both within the NHS and as an independent consultant covering Acute & Community involving Finance, Information, Contracting, Commissioning, Performance Management and Service Planning.

Healthcare Analysis & Forecasting (HCAF) was established in 1995 with clients including Trusts, PCTs, SHAs, Prudential and Glaxo plc. A disease management study in gastrointestinal bleeding & ulcers won an international award within Glaxo plc. In 1996 he completed a review of bed requirements for the Royal Berkshire Hospital. The Trust eventually submitted a further business case to bring bed provision in line with the original forecasts.

During 2001/02 he was involved in the Hospital Operational Intelligence Project (HOIP) investigating best practice in the use of operational intelligence to match capacity with demand. He was Statistical Advisor to the Thames Valley Strategic Health Authority from its inception, has provided support to the Met Office Health Forecasting Unit and provides advice to the South Central Strategic Health Authority.

Rod has developed unique expertise in the actuarial basis of financial risk for capitation funded healthcare purchasers and the formulation of risk instruments to minimise this risk.

His research has led to the development of many innovative and new methods for understanding the operational and financial challenges in healthcare. He is the author of hundreds of papers, articles & reports, is an invited speaker at national conferences and is a member of the editorial board of the British Journal of Healthcare Management.

Recent Projects (last two years)

- Forecast outpatient & inpatient attendances (NHS & private) at a proposed new community/acute site
- A review of maternity beds and costs at two acute hospitals
- A review of specialty bed pools at a Foundation Trust hospital
- A capacity planning tool for a Foundation Trust hospital
- A review of hospital reference costs and resulting LDP challenge for a group of three PCTs
- Analytical support to the Marie Curie end of life DCP care project
- Financial risk in healthcare purchasing – series of three papers in BJHCM
- A review of hospital counting & coding for a consortium of eight PCTs
- Supporting analysis for a community hospitals review
- Financial & operational analysis for early achievement of 18 weeks in NHS South Central
- A review of admission rates for a PCT using OPCS procedure codes
- Detailed small area analysis of admissions sensitive to primary care intervention for a PCT
- Analysis of financial pressures at Isle of Wight Healthcare due to conflicting assumptions within the national tariff and the capitation formula
- Support for Specialist Commissioning at a SHA
- Modelling of activity required for next years contract for two PCTs
- Specialty-specific costs in the NHS HRG tariff and implications to perceived efficiency.

Prior Projects

- A review of alternative sites for a new hospital using small area geo-demographic modelling. Some 35 alternative configurations including acute and satellite sites were evaluated.
- Forecast shortfall in admissions at two Independent Sector Treatment Centres based on travel time and competition with other sites.
- A review investigating methods the extent of abuse of the definition of ‘day case’ across English providers for a SHA.
- Detailed support to the LDP process at South Central SHA
- Detailed support to the LDP process at Thames Valley SHA
- Advise on the limitations of various DH capacity & demand models to enable the SHA to give a measured response.
- A review of outpatient to inpatient conversion rates for GP practices in a SHA.
- A review of admission rates across Thames Valley SHA using small area geo-demographic methods.
- Analysis of demand and capacity at Orthopaedic departments supporting the TV SHA review of Orthopaedics.
- Statistical support to the TV SHA review of Paediatric deaths at the ORH
- Analytical support to the TV SHA community matrons project
- Analytical support to a review of healthcare services in Hertfordshire
- Capacity planning support to acute trusts (multiple sites)
- Review of bed requirements (multiple sites)

Publications

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- Jones, R (2008) Limitations of the HRG tariff: day cases. British Journal of Healthcare Management. 14(9), 402-404.
- Jones, R (2008) A case of the emperor's new clothes? British Journal of Healthcare Management. 14(10), 460-461.
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- Jones, R (2009) Limitations of the HRG tariff: the RCI. British Journal of Healthcare Management. 15, in press
- Jones, R (2009) Limitations of the HRG tariff: annual averages. British Journal of Healthcare Management. 15, in press
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- Jones, R (2009) Costing emergency assessment unit admissions. British Journal of Healthcare Management. 15, press
- Jones, R (2009) Costing A&E attendances. British Journal of Healthcare Management. (Submitted for publication)
- Jones, R (2009) Very small area demographic factors influencing admission to hospital. British Journal of Healthcare Management. (Submitted for publication)
- Jones, R (2009) Very small area demographic factors influencing outpatient attendances. British Journal of Healthcare Management. (Submitted for publication)