

Forecasting Demand

Dr Rod Jones (ACMA)

Statistical Advisor

Healthcare Analysis & Forecasting, Camberley

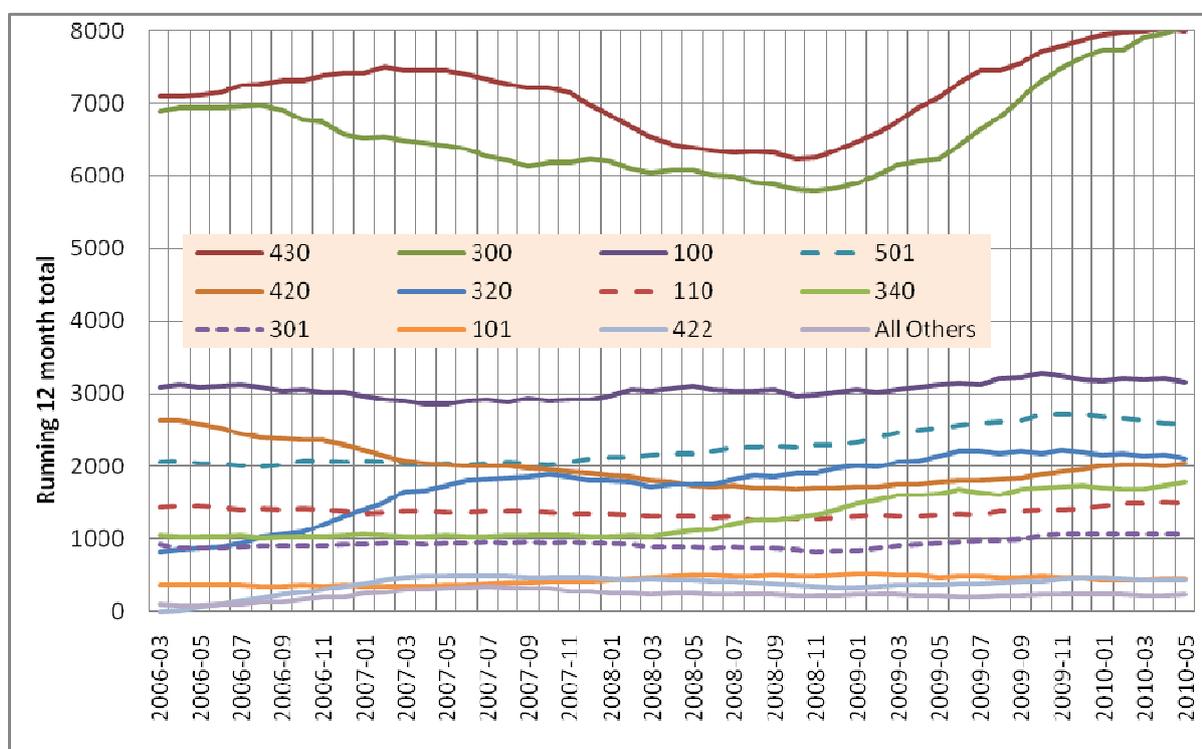
hcaf_rod@yahoo.co.uk

Further articles in this series can be viewed at: www.hcaf.biz

NHS staff can download the published version using their Athens login at www.bjhcm.co.uk

Recent comments that commissioning in the NHS only rates about 3 out of 10 should lead to a consideration of why it is so hard to effectively commission rather than why are 'they' so rubbish? A large part of the unacknowledged difficulty in commissioning lies in the inability to accurately forecast demand and hence to fix budgets.

Fig.1: Trends in >1 day stay emergency admissions at Specialty level



Footnote: Data is for a PCT in the South of England. Specialty codes are: 100 General Surgery, 101 Urology, 110 Trauma, 300 General Medicine, 301 Gastroenterology, 320 Cardiology, 340 Respiratory Medicine, 420 Paediatrics, 422 Neonatal, 430 Elderly Medicine, 501 Obstetrics. For a running 12 month total a step change will lead to a ramp up in activity over 12 months.

So, what actually drives the increase in demand? Experience shows that factors other than demographics are the main components of the increase. For elective inpatients the trends over time are usually linear but interrupted by step changes. The slope of the linear portions between the step changes is a function of the specialty or procedure. The value of the slope will be close to that expected from demographics for something like General Surgery and more than three-times higher than demographics for something like Orthopaedics. Trends downward can also occur as in elective Gynaecology. The step changes mostly occur when an acute site institutes a change in counting or coding or makes a fundamental service change. Such step changes are unpredictable but very common and account for a significant part of the observed increase in activity. The trends in other specialties

An edited version of this article has been published as: Jones R (2010) Forecasting demand. *British Journal of Healthcare Management* 16(8): 392-393. Please use this to cite.

can be influenced by environmental factors. For example, elective demand for ENT appears to mirror the trend in tonsillitis as reported by the RCGP Birmingham research unit. Incidence of glue ear (high in the early to mid-1990's) abruptly disappeared in the late 1990's and the disappearance was nothing to do with efforts at demand management.

For emergency admissions the situation is more complex. Once again demographic change appears to play a minor and sometimes negligible part. Studiously ignore any PCT plan formulated around demographic growth! By far the greatest increase (>70%) has been in emergency admissions with a zero day stay, i.e. admitted and discharged on the same day. The opening of emergency assessment units (a step change event) has hastened this trend. The current short stay HRG tariff over-remunerates Trusts for this work but that is a separate issue. The next source of growth appears to be a (10% to 15%) step-like increase in medical emergency admissions (cardiology, general & elderly medicine) which occurs every three to six years. This long-term cycle has only recently been identified mainly due to the cloud of confusion generated by commissioning (too many things happening at once) which has not encouraged serious consideration of long-term trends. Other specialties appear to follow what can be loosely described as long-term cycles. Key point – always look at long-term trends and attempt to separate out zero day stay, one day stay and >1 day stay 'admissions'. Fig.1 gives an example. Trends in GP referral tend to follow a mix of the emergency and elective patterns.

Having identified the broad outline we need to think about the specifics. For the purpose of commissioning I always recommend planning at Specialty level. Acute hospitals operate at specialty level and HRG's are the language of finance and can span multiple specialties. This tends to muddy the waters somewhat. Unfortunately the HRG v4 grouper no longer assigns a dominant specialty. Talk to your PCT about alternatives such as admitting or discharging specialty or even looking at trends in finished consultant episodes (FCE). Planning at HRG chapter is a possibility but will require a long time series at HRG V4 level to be of any use. For more clinically focussed work the trends using OPCS procedure codes or ICD-10 diagnosis codes may be helpful. As a tip, look at the trend by first combining elective and emergency admissions together. The boundary between elective and emergency is surprisingly fluid and varies greatly between different acute sites.

Lastly, always remember that demand is subject to statistical variation and that this variation gets exponentially larger as the level of activity gets smaller. Good trends will emerge when there are greater than 1,000 admissions/attendances per annum to work with. The suggested reading covers a range of issues identified above.

Suggested Reading

Beauchant S and Jones R (1997) Socio-economic and demographic factors in patient non-attendance. *British Journal of Healthcare Management*: 3 (10), 523-528

Blunt I, Bardsley M, Dixon J (2010) Trends in emergency admissions in England 2004-2009: is greater efficiency breeding inefficiency? The Nuffield Trust, London.

Jones R (2007) A level playing field? - A discussion document for PCT's exploring the implications of how events get counted at acute trusts. *Healthcare Analysis & Forecasting*, Camberley, UK. <http://www.docstoc.com/docs/5049790/Level-Playing-Field>

Jones R (2004) Financial risk in healthcare provision and contracts. Proc. 2004 Crystal Ball User Conference, Denver <http://www.docstoc.com/docs/5049810/Financial-Risk-in-Healthcare>

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

Jones R (2009) Trends in emergency admissions. *British Journal of Healthcare Management*: 15(4), 188-196

Jones R (2009) Cycles in emergency admissions. *British Journal of Healthcare Management*: 15(5), 239-246

Jones R (2010) Unexpected, periodic and permanent increase in medical inpatient care: man-made or new disease. *Medical Hypotheses* 74(6), 978-983.

Jones R (2010) Can time-related patterns in diagnosis for hospital admission help identify common root causes for disease expression. *Medical Hypotheses* 75(2): 148-154.

Jones R (2010) The case for recurring outbreaks of a new type of infectious disease across all parts of the United Kingdom. *Medical Hypotheses* 75(5): 452-457.