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Why is the 'real world' financial risk in health care commissioning so high?

Dr Rod Jones (ACMA, CGMA)
Statistical Advisor
Healthcare Analysis & Forecasting, Camberley
hcaf_rod@yahoo.co.uk

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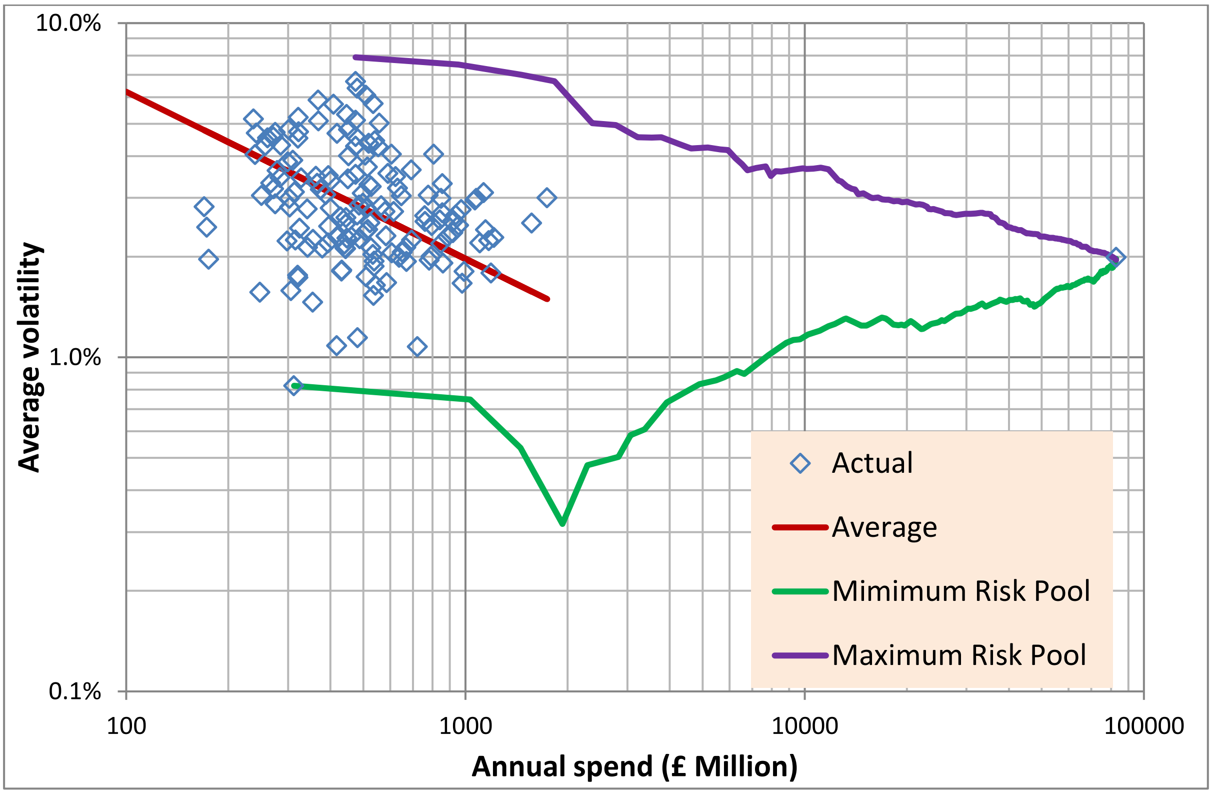
Over the past three years a comprehensive series of articles in BJHCM have sought to unravel the complex issues behind 'real world' financial risk in health care commissioning including the difficulties associated with forecasting future demand.

Figure 1: Volatility in total health care expenditure



Footnote: PCT level expenditure between 2003/04 and 2010/11 were extracted from the 'Programme Budgeting' pages of the Department of Health website (http://www.dh.gov.uk/en/Managingyourorganisation/Financeandplanning/Programmebudgeting/DH_075743#_1). Growth-adjusted year-to-year volatility in expenditure was calculated as a percentage: [Year (n+1) – Year (n) – Slope]/Year (n). The slope of the trend over time for each PCT was determined by linear regression.

It has been observed that the risk calculated by computer simulation (i.e. the minimum possible case scenario) is already unacceptably high and that adding in the effects of the environment and high cost individuals leads to 'real world' risk which is up to three-times higher than the minimum case scenario.

How do we understand the practical effects of risk? Risk and volatility are interlinked, and a useful way to view risk is to look at the year-to-year volatility in health care expenditure, i.e. does expenditure jump about erratically?

In this respect Figure 1 displays the average year-to-year volatility in total health care expenditure experienced by English PCTs over the seven year period 1994/95 to 2010/11 after adjusting for the underlying growth in expenditure. The data is presented as a log-log plot since this reflects the fundamental role of Poisson statistics in determining the relationship between volatility and size (Jones 2009).

Over this period health care funding grew at a roughly constant rate (approximately 6% per annum) and the volatility has been adjusted for underlying linear growth. Average national volatility is 2% and we firstly need to sense check this. Computer simulation of variation in costs using a set of limiting assumptions (i.e. known case mix, excluding any environmental effects ('bad' winters), 22 high cost HRG and high cost individuals) shows that the minimum theoretical volatility for PCT sized organisations is around 1.1% (Jones 2008). Given that winter falls at the end of the financial year, giving high volatility in medical costs, and adding back high cost patients will easily give average volatility in the range 2% to 3%, and hence the results in Figure 1 are indeed a reflection of 'real world' volatility in expenditure rather than data errors.

Further consideration of Figure 1 leads to a number of key conclusions. The first key observation is that the bulk of PCTs experience higher than 2% average volatility, yet the national average were 2%. To reconcile this apparent discrepancy PCTs were ranked from lowest to highest or highest to lowest volatility and the resulting average volatility calculated for a risk pool where one extra PCT is incrementally added at a time. The line for the Minimum Risk Pool shows an amazing minimum risk of only 0.3% when the four (geographically disperse) PCTs having the lowest risk are aggregated together. What has happened is that peaks and troughs in expenditure have almost exactly cancelled out giving the financial stability equivalent to winning the lottery. This is counter balanced by another group of four 'unfortunate' PCTs whose combined average risk was around 5%.

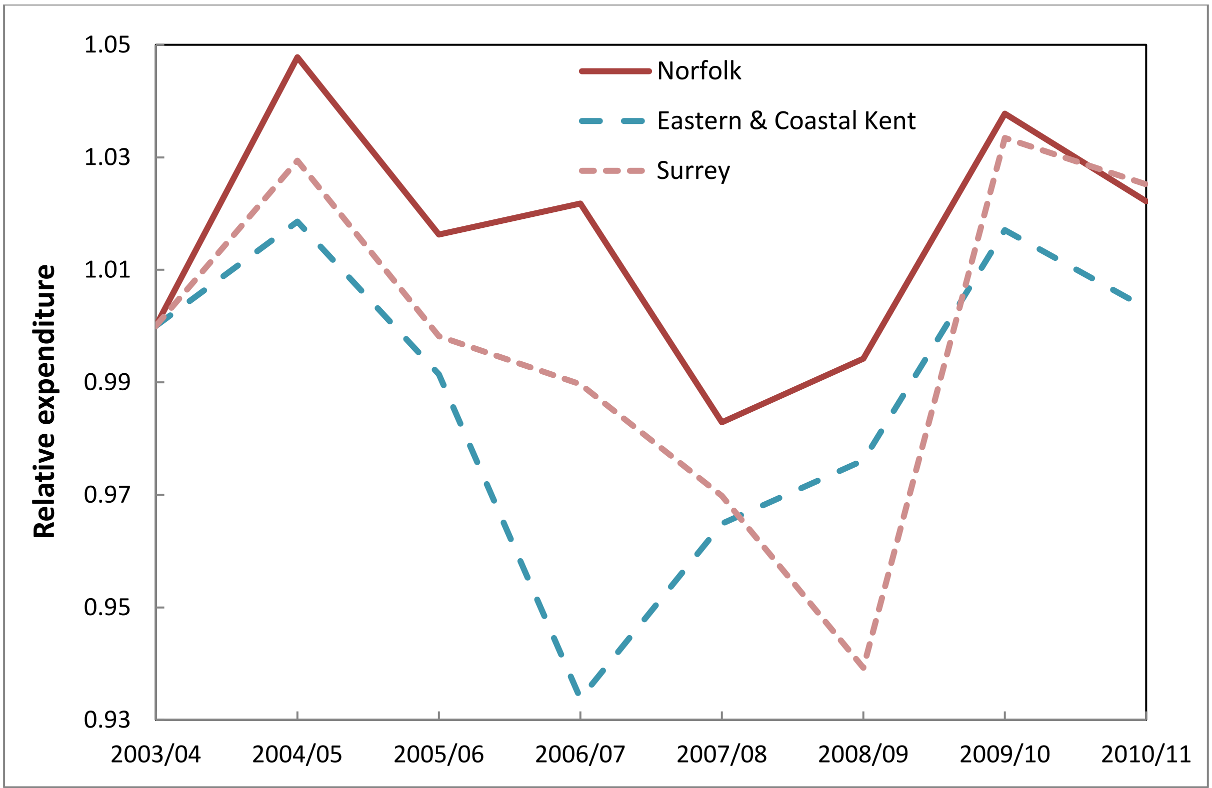
Figure 1 clearly demonstrates that while there is a nominal trend line describing the 'average' volatility (risk), which increases as organisations get smaller, there is also considerable scatter around this average. It is clearly more difficult to deliver a balanced budget in some locations than others which seems to arise from the wide range in the environment (weather, air quality and infectious outbreaks) experienced across England.

This highlights issues around financial risk within the larger commissioning support organisation (CSO). Equitable risk sharing would put all CSOs at the national average of 2%, however, formulation of risk pools on the basis of geography alone can lead to a spectrum of financial risk exposure lying between the Minimum and Maximum risk pool lines, i.e. issues surrounding the post code lottery and equity.

The next key point is that most CCGs will have an annual expenditure of somewhere around £100 million and should duly expect to cluster around 6% average volatility (if allowed to operate for a seven year period). Given that even the smallest overspend must be bought under control it should be appreciated that CCGs will become embroiled in the same frenzy of stop/start, spend/cutback, as were PCTs before them, but with the added disadvantage of being smaller and experiencing higher intrinsic volatility.

In order to explain the high volatility in the real world it has been suggested that a cycle of costs may be arising through periodic outbreaks of widespread immune imbalance, hence an increase in infection and inflammation, possibly due to undulations in the level of 'active' infection with the ubiquitous herpes virus cytomegalovirus (CMV). Figure 2 presents preliminary evidence to suggest that this may indeed be the case with slow infectious spread commencing in 2007/08 and occurring through to 2009/10. This would explain the shape of the curves previously reported for the whole of England (Jones 2012a) and is consistent with relatively slow transmission of CMV via contact with body fluids, saliva and semen being the most likely (Jones 2012b). It would seem that both the funding formula and the HRG tariff may be subject to flawed assumptions regarding the spatio-temporal behaviour of costs (Jones 2011, 2012a). Alternately we may be dealing with some form of complex organisational behaviour. Whichever is the case, we need to know because the required financial and non-financial remedies differ depending on the cause.

Figure 2: Relative expenditure (growth adjusted) for three large PCTs



In the following months a series of articles will investigate the reasons behind this very high 'real world' volatility in expenditure. Expenditure will be broken down into costs associated with acute occupied bed days (inpatient costs), costs associated with cancer care (initial diagnosis triggers a cascade of costs) and end of life care (using the trend in deaths over time as a proxy). Each article will examine the individual level of volatility which would be experienced by a CCG for that aspect of expenditure and will examine the evidence for long-term cycles in costs which may be increasing the real world volatility. Opportunities to reduce volatility will also be discussed. It is hoped to conclusively demonstrate that real world financial risk is indeed very high and that the move to CCGs is only likely to increase the general chaos rather than ameliorate it.

It is the author's and many others firm opinion that well motivated GP involvement in commissioning will lead to considerable cost savings; however, these will be achieved in the midst of a confusing jumble of financial risk issues. It is the financial risk issues which present the greatest danger of disillusionment and loss of GP involvement simply because these issues have not been fully acknowledged and imply solutions which while being eminently sensible are somewhat ideologically unacceptable (depending on your viewpoint).

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