# Are there cycles in outpatient costs?

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In 2010/11 English PCTs spent £8.3 billion on outpatient attendances. A series of articles in BJHCM has been exploring the possibility that emergency medical admissions, A&E attendances, ambulance call-outs and wider health care costs in all parts of the UK and other Western countries appear to follow a common cyclic time pattern (Jones 2009, 2010a-d, 2011a-c, 2012a-f). A companion article in this edition has investigated the financial risk associated with hospital bed occupancy in English PCTs and has demonstrated that a spatio-temporal cycle also applies (Jones 2012e). While it may be tempting to conclude that this cycle is the result of a reduction in acute admission thresholds (Blunt et al 2010) this fails to explain the same cycle in other parts of health care which do not depend on acute thresholds and the international scope.

**Figure 1: Growth in first outpatient attendance, England**
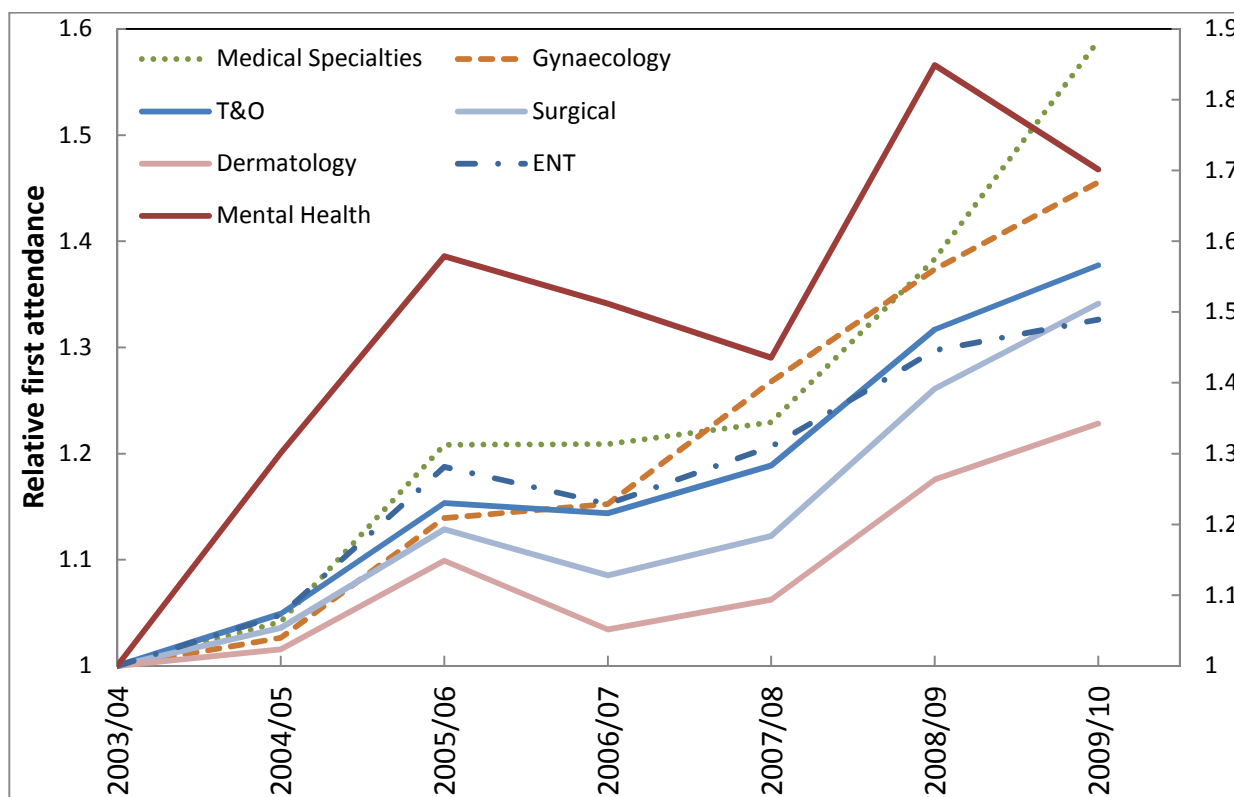
Footnote: Data has been extracted from the HESonline website (http://www.hesonline.nhs.uk/Ease/servlet/ContentServer?siteID=1937&categoryID=894) and only specialties displaying a clear cycle have been displayed. Medical and some surgical specialties have been grouped together. The axis for Mental Health is on the right hand side.

It is well known that GP referrals have increased (without apparent explanation) in recent years and this has prompted attempts to curtail referrals based on the assumption that there is something 'wrong' with the GP referral process. While it will always be true that some GP referrals are unjustified and that there are differences in the referral threshold for different conditions amongst GPs; it is somewhat striking that the increase appeared to happen en masse. In this respect Figure 1 shows a time trend for first outpatient attendance in England for a number of key specialties. Note that this Figure contains two cycles, one initiated in 2002 and the next in 2007 and both are the result of initial 'outbreak' followed by subsequent further spread. As can be seen the same cycle discussed above appears to hold with the suggestion that some specialties may have a time lag relative to others. A blanket increase in GP referral would not display lags between specialties.

To investigate this curious behaviour in greater detail Figure 2 presents a monthly time series for GP referrals in Wales, where different policies and management styles apply. A running 12 month total has been applied because this is an excellent method to pinpoint a step change in behaviour. For example, when GP referrals are running at a rough average of 100 per month this will give a 12 month total of 1,200. However if referrals suddenly step up to 110 per month (not easy to detect amidst random scatter) the running 12 month total will now be 11 months at 100 plus 1 month at 110, in the second month after the step change it will be 10 months at 100 plus 2 months at 110, etc. Hence a step change leads to a ramp commencing at the point of the step change, while the extent of the step-change is revealed at the point 12 months later.

Figure 2: GP referrals in Wales (running 12 month total)
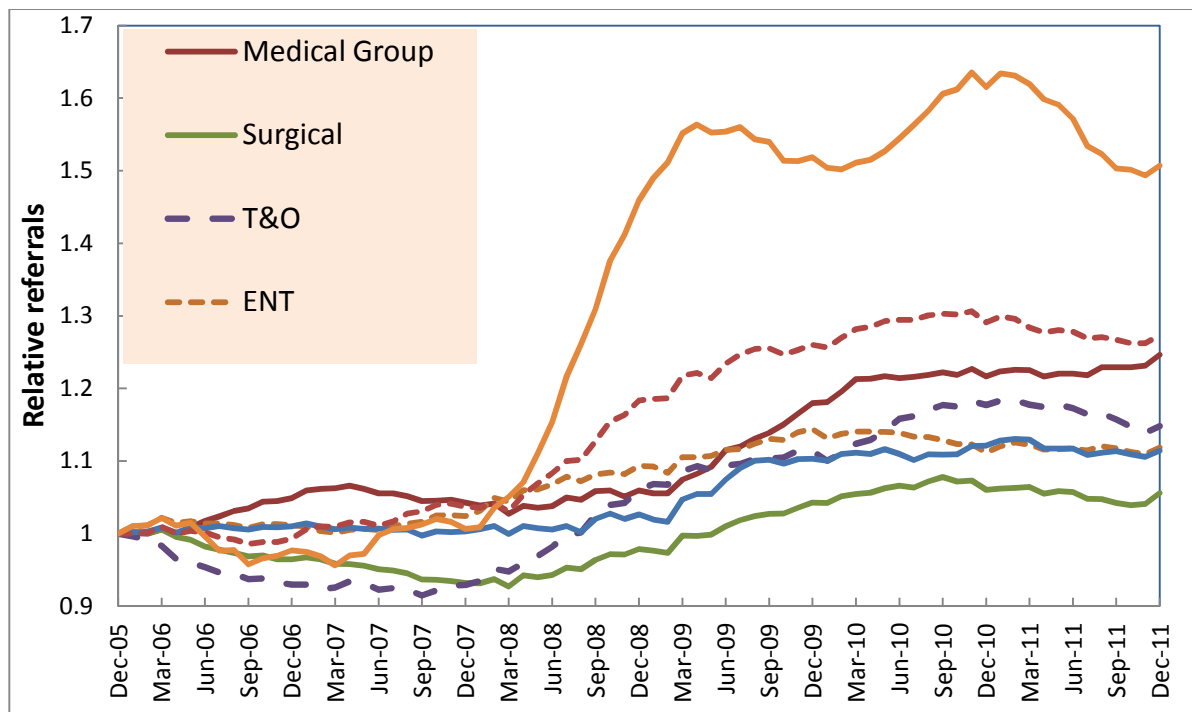
Footnote: Data has been extracted from the STATSWALES website (http://www.statswales.wales.gov.uk/ReportFolders/reportfolders.aspx?IF_ActivePath=P,280,1033,2949) and the same specialty groupings were applied as for the English data.

Inspection of Figure 2 reveals the following time cascade: December 2007 (Adult Mental Health, Orthopaedics, Dermatology, ENT), February 2008 (Surgical and Medical groups), March 2009 (Gynaecology). It should be noted that the Adult Mental Health group displays the same behaviour for the English data where the scale for Mental Health is on the right hand Y-axis in Figure 1.

It is impossible to explain such time cascades and spatio-temporal patterns (the onset of the increase occurred slightly later in Wales than England) from any known demographic or management phenomena and the patterns appear to fit with proposed outbreaks of the active (as opposed to dormant) form of cytomegalovirus (CMV) infection (Jones 2012f). The time lags between specialties correspond to the spectrum of immune related conditions emanating out of initial infection through to eventual medical condition. The specialties so affected matching with a spectrum of diagnoses identified to be associated with these outbreaks and this is true even for Mental Health where CMV causes depression, related behavioural effects and other neurological disorders (Jones 2012g).

The observation that both inpatient and outpatient costs never fully return to the base-line position (Jones 2010a) is explained by the fact that the ageing population is providing an ever increasing reservoir of elderly persons (with associated immunoscenescence) for this virus to both propagate and exert its multiple cascade of immune-initiated diseases (Jones 2012g).

Hence given the above background we can calculate the likely financial impact of each outbreak. In Wales total GP referrals (excluding Obstetrics& Midwifery) initially increased by around 15% (90,000) equivalent to around £18 million of first attendance and probably another £18 million of follow-up attendances which in total amounts to around £12 per head of population. This is a recurring increase since the step-increase is semi-permanent. In England a conservative estimate (based only on the specialties listed in Figure 1) for the cumulative effects of the 2002 and 2007 events for the years between 2004/05 and 2009/10 is around 9.5 million excess first attendances over and above that which would have arisen from demographic change which along with one follow-up gives around £2.9 billion of excess costs or roughly £0.5 billion per annum or around £10 per head per year. If figures such as these are the case then the proposed £20 billion of NHS cost savings (including the perceived need for new legislation and a massive NHS re-organisation) may have been necessitated from an entirely unexpected source.

An inspection of NHS data going back to the paper-based Korner statistics indicates that such patterns are merely a repeat of past occurrences (unpublished studies). It would appear that no one was looking, and if they were, the patterns were dismissed as data quality problems. If these patterns repeat the next outbreak of this virus should occur anytime from the present to 2015 and it may be prudent to put the appropriate monitoring in place to confirm if the proposed association is true. If it is, then vast areas of health care policy, planning, finance and public health medicine will need to be re-written.

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