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Long-term cycles in admissions for neurological conditions

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"Men occasionally stumble over the truth, but most of them pick themselves up and hurry off as if nothing had happened" adapted from Winston Churchill

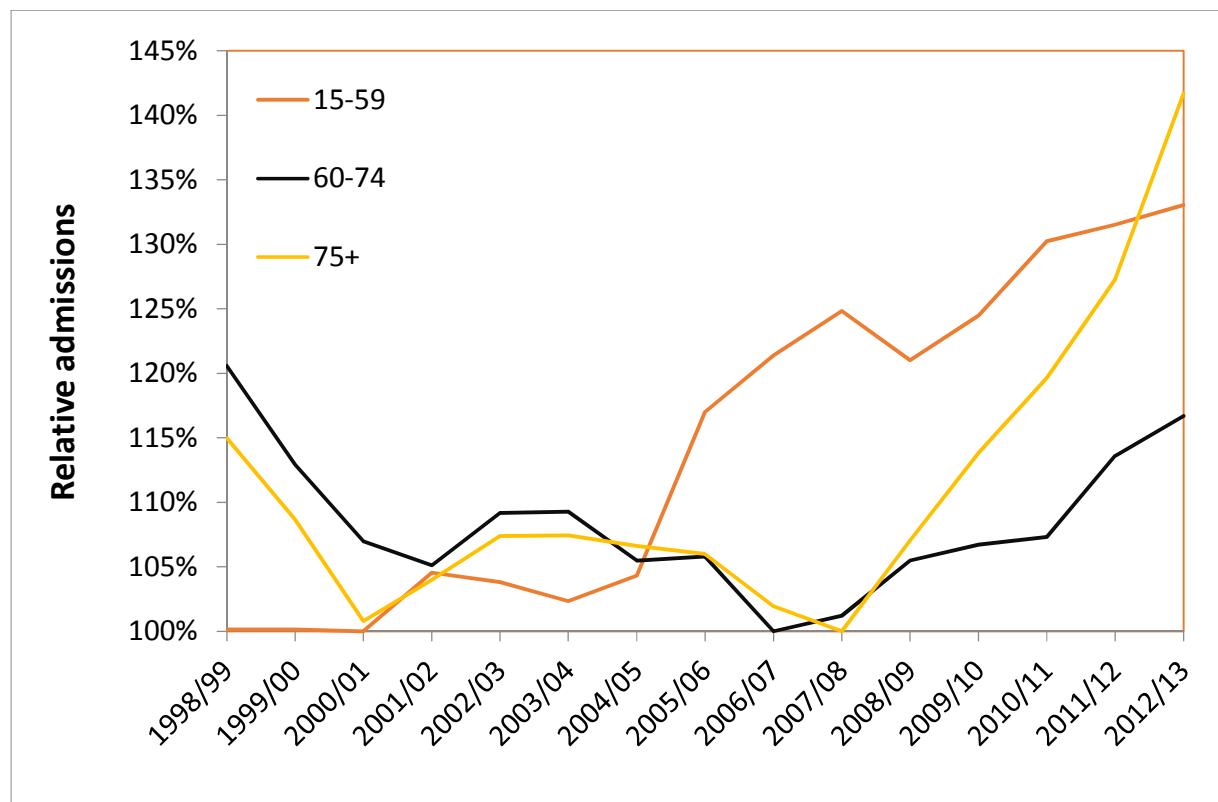
A series of articles in BJHCM over the past four years has demonstrated a series of long-term cycles covering every aspect of primary and secondary care; namely, deaths, medical admissions in general and for specific conditions/diagnoses, occupied beds, GP referral and outpatient first attendance and wider costs [reviewed in Jones (2013a-b)]. These cycles result in rapid changes in the case mix arriving at A&E (Jones 2014b) and even appear to extend to subtle alteration in the gender ratio at birth (Jones 2013c). Age and gender specificity has also been demonstrated (Jones 2014d) as has evidence for an infectious-like spatiotemporal spread across the UK following the initiation of each cycle (Jones 2013a,d, 2014a,c). An additional series has pointed out that these cycles have profound implications for financial risk and financial management [reviewed by Jones (2013e)].

The last of these infectious-like events commenced in 2012 in England, although slightly earlier in Scotland (Jones 2013d), and resulted in a large increase in elderly deaths (Jones 2014b). The largest increase in deaths was experienced by those suffering from dementia, Alzheimer's and Parkinson's all of which are neurodegenerative diseases (Jones and Goldeck 2014). Changes in outpatient case mix have been demonstrated to occur in neurological conditions surrounding the 2012 event (Jones and Goldeck 2014). In this respect it would be interesting to see if inpatient admissions for these conditions show evidence for cycles.

Analysis of Hospital Episode Statistics (HES) data over the period 1998/99 to 2012/13 shows an increase in adult admissions for the dementia/Alzheimer's/Parkinson's group of diagnoses from 65,350 in 98/99 to 77,060 in 12/13; however, as can be seen in Figure 1 the changes are highly age specific. Hence between 98/99 and 12/13 the proportion of age 15-59 admissions increase from 10% to 13% of the total while age 60-74 declines from 24% to 20% and 75+ increases from 65% to 69% of the total.

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Figure 1: Trends in admissions for neurological degenerations



Footnote: All possible codes covering dementia, Alzheimer's and Parkinson's are as follows: F00-F03, F05-F06, G04, G12, G20-G21, G30-G31, G36-G37, G82. These codes are from Russell et al (2013) but excluding F10 (use of alcohol) and G35 (Multiple sclerosis). Data is finished consultant episodes (FCE) and is for the primary diagnosis.

To understand the implication of what is happening requires further scrutiny of Figure 1. Firstly the cycles are centered around the last three outbreaks in 2002, 2007 and 2012 in which age 75+ appears to respond early in the outbreak while ages 15-59 especially appear to lag behind by one to two years. Such lags are suggestive of slower disease progression in the younger age groups. This is especially evident for the 2012 outbreak with a dramatic increase in the age 75+ group while the other two groups enter the minimum point of the cycle and will presumably increase in 2013/14 or 2014/15.

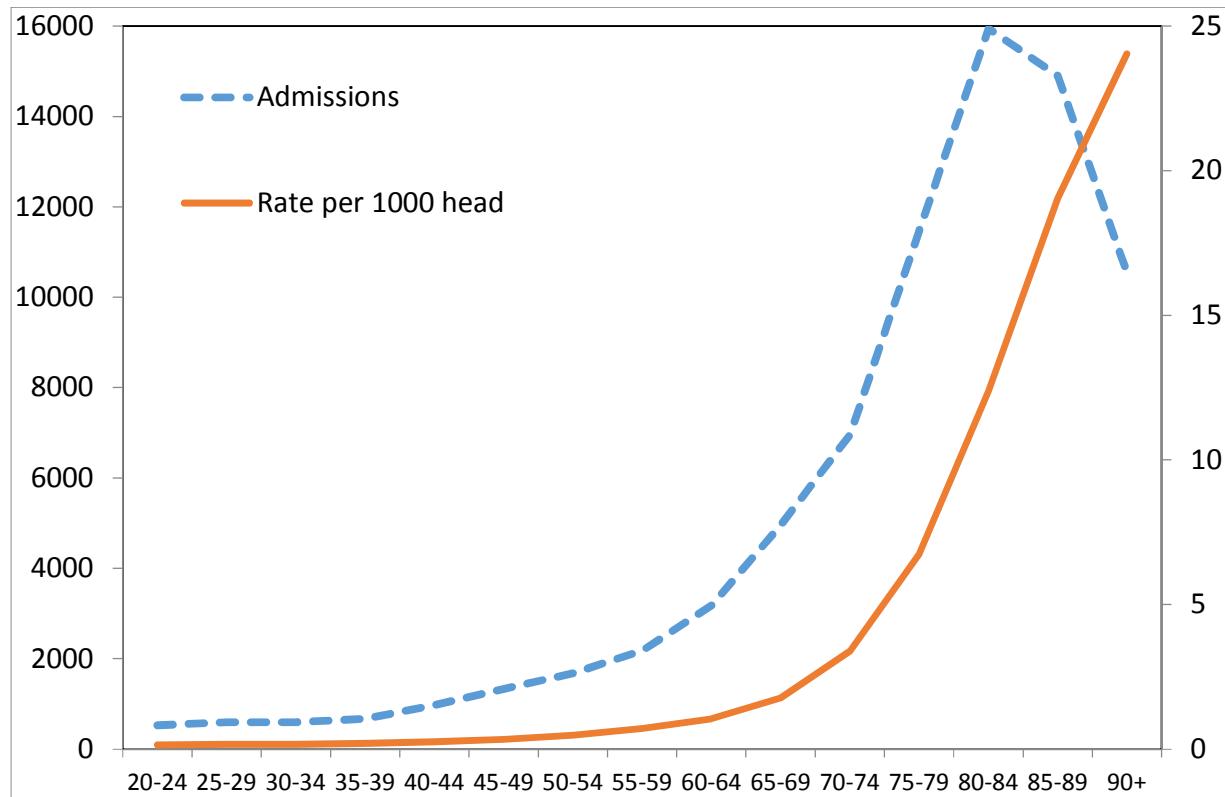
The second observation is the dramatic rise in the 15-59 age group prompted by the 2002 outbreak and the rise in the 75+ group specifically after the 2007 outbreak. It has been suggested that each outbreak arises from different strains of the same infectious agent (Jones 2013a-b) and this may be indicative of strain-specific effects.

Figure 2 presents the admissions for the same diagnoses which occurred in 2012/13 and which are the cumulative effect of these long-term changes. Clearly whatever is happening is complex and is not going to be addressed by simplistic initiatives. Indeed recent research has revealed

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that the pathways of neurodegenerative disease are based on process of systemic inflammation (Ferrari and Tarelli 2011) and hence will show considerable time-based behavior.

Figure 2: Admissions and admission rate by age band, 2012/13



Footnote: Admissions are on the left hand axis, admission rate on right hand side. List of diagnoses as per Figure 1.

In this respect, the path chosen by the Department of Health and NHS England which appears to blame various NHS organisations for 'failure to manage demand' as a major cause of the 'problem' is becoming increasingly untenable. Indeed is the current government's belief that privatization will solve the (financial) pressures, likewise based on an incorrect interpretation of the trends and their fundamental meaning? As they say, bad science only begets bad policy.

Clearly the financial pressures are not going to go away on their own accord. However it is only when it is realized that the pressures arising out of these outbreaks are beyond the control of all concerned (Jones 2013d, 2014a,c, Jones and Beauchant 2014), is it possible to see that a collaborative approach is likely to be far more beneficial than the current (needlessly) adversarial approach.

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