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Gender ratio and cycles in population health costs

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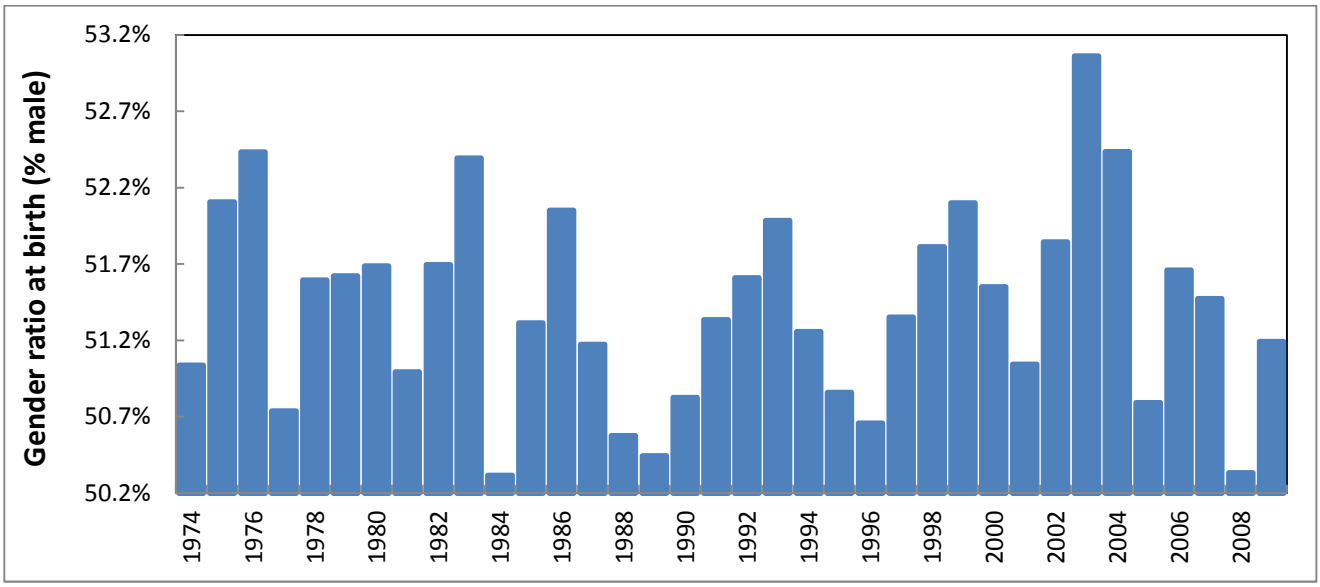
Everyone 'knows' that the gender ratio at birth is around 51.2% males (105 males per 100 females) – at least that is as far as a superficial understanding of the topic would lead to. However Figure 1 shows what appears to be an amazing long-term cycle in the gender ratio for births in Scotland during the month of August (conception in December) between 1974 and 2009. The gender ratio is certainly not constant.

Figure 1: Gender ratio for births in August, Scotland



Footnote: Data kindly provided by General Register Office for Scotland.

The gender ratio has been shown to be influenced by the solar cycle, season, and latitude all of which relate to gradients in solar radiation intensity either due to time or place (Davis & Lowell 2008, 2009). There are additional sensitivities to nuclear radiation (Scherb & Voigt 2011), infectious agents (Blumberg 2006) and the occupation of the mother (Ruckstuhl et al 2010). Recall that the gender ratio is influenced by factors regulating both fertilization and spontaneous abortion.

Both month and year of conception (hence birth) have been shown to influence the disposition to longevity and certain physical and mental health conditions (Davis & Lowell 2004a-b, 2006). Additional research shows a link between the incidence of breast cancer (six

different cervical abnormalities) and fluctuation in five physiologic measurements (temperature, pulse, blood pressure, etc) and the solar cycle (Hrushesky et al 2011). While the solar cycle is a relatively weak cycle the importance of such observations is that many fundamental aspects of human health status are profoundly and intimately related to the external environment.

Careful inspection of Figure 1 suggests a modest background 11 year solar cycle overlaid with a far stronger cycle where the peaks in gender ratio appear to coincide with outbreaks of what has been described as a new type of infectious immune disease (Jones 2010, 2012b) which also has profound effects upon total health care costs (Jones 2012a,c). Data from Scotland has been chosen due to the observation that 'outbreaks' appear to occur earlier and more frequently in Scotland than England (Jones 2010).

It is my perception that the role of government health departments around the world in pursuing cost control strategies has led them to overemphasize the role of organisational behaviour and efficiency as the 'major' cause of higher costs. This view was reflected in a recent Nuffield Trust report on the rise in emergency admissions where acute admission thresholds were largely blamed as the source of the problem (Blunt et al 2010). This is contradicted by research in the US which shows that clinical thresholds remain constant in spite of fluctuating demand pressure (Sharma et al 2008).

Hence it has been easier to claim that the problem is inefficient systems (which of course will always be partly true) rather than admit that inefficiency is only one part of a larger story relating to the dynamic behaviour of costs over time. Hence the implication 'if you were a more efficient "GP/clinician/manager" these "referrals/length of stay/costs" would not be behaving like this', etc.

The problem with such high level efficiency arguments is that they can confuse cause and effect. For example, conventional wisdom is to close beds to save money, however, the real route to efficiency is to maintain a safe occupancy margin and flex the staff to match the need (Jones 2011a,b). Unfortunately such arguments may have (in part) led politicians to reason that fundamental reorganisation was the only route to reducing NHS costs – although, as always, the full set of issues are more complex (Dixon 2012).

While the direct costs relating to the particular gender ratio cycle in Figure 1 may be relatively small it is the bigger picture to which they could be pointing that may hold the key to larger cost behaviour(s).

Research into the solar cycle and gender ratio requires large data sets streatching over many years and seeks to establish cause and effect in the face of high background statistical scatter. Any possible association in Figure 1 therefore remains an interesting possibility' and in this respect is probably a good example of the wider difficulty of attributing cause and effect between health care 'efficiency' and the multitude of cost behaviours.

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No one is suggesting that we neglect the role of efficiency in health care, the argument is with the correct attribution of cause and effect and hence solutions which address the totality of the problem(s).

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