An edited version of this article has been published as: Jones R (2015) Forecasting medical emergency admissions. ***British Journal of Healthcare Management*** 21(2): 98-99. Please use this to cite.

Forecasting medical emergency admissions

Rodney P Jones
Healthcare Analysis & Forecasting
Camberley
hcaf_rod@yahoo.co.uk
www.hcaf.biz

Further articles in this series are available at http://www.hcaf.biz/emergencyadmissions.html

The published version is available at http://www.bjhcm.co.uk

The NHS has been having a 'bad' winter with A&E departments overflowing and medical admissions at record levels. All of this begs the question, how do we forecast medical admissions?

The traditional approach, typically espoused by those with a Public Health background would be to take past admission rates by age band and project forward, with perhaps some allowance for the possibility of a 'bad' winter.

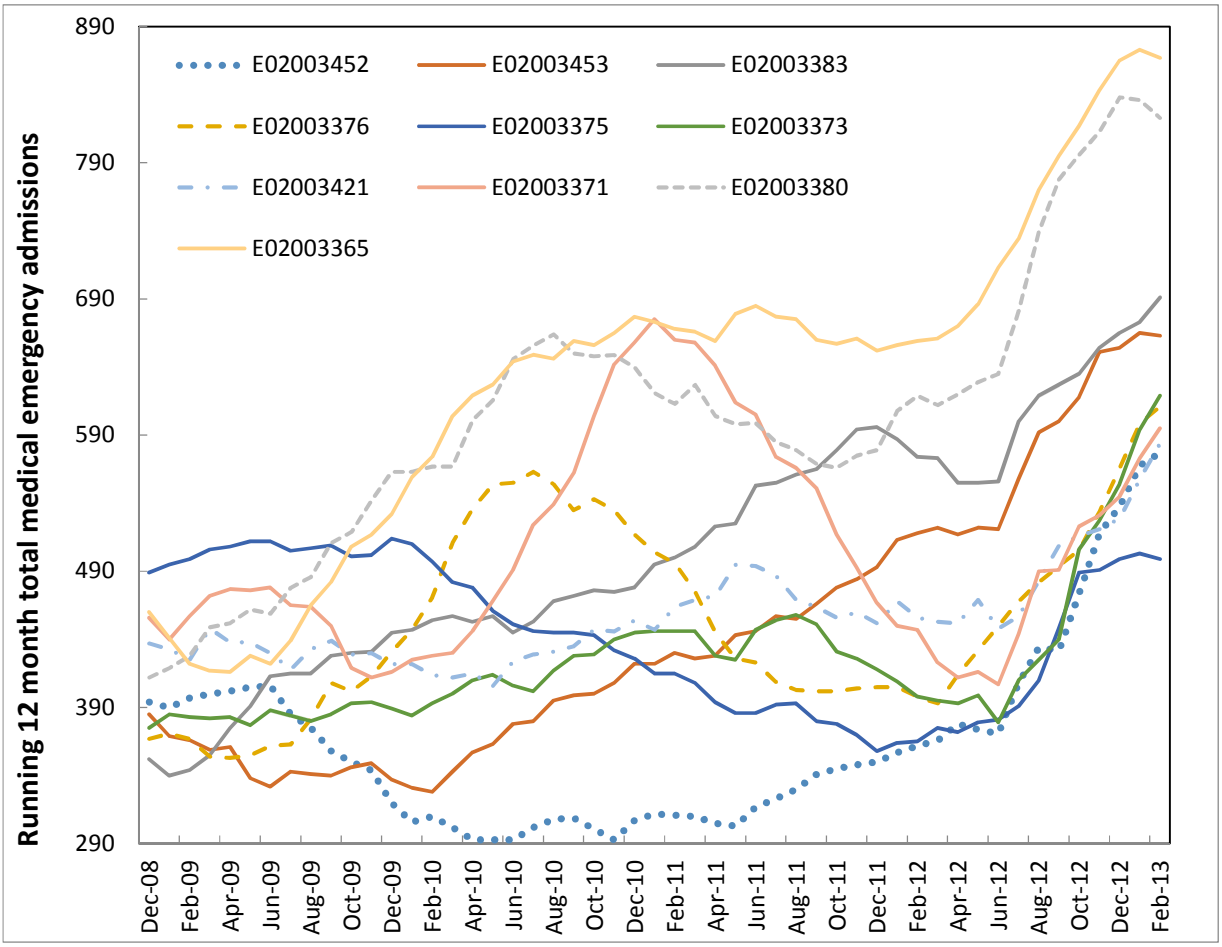
As many of you will already know, based on a 22 year career forecasting demand for NHS capacity and financial planning, I have consistently stated that there is no evidence whatsoever to suggest that demography is a valid method for forecasting certain types of medical admissions (Jones 2010).

Indeed as Fig. 1 suggests there are forces at work which dominate the trends observed at small area level. Fig. 1 uses Mid Super Output Area (MSOA) data from Berkshire and shows the trends for the 10 MSOA in Berkshire having the lowest number of medical emergency admissions. MSOA with the lowest number of medical admissions have been used because it avoids the possibility of spatial effects due to different population and social groups.

Note that above 300 admissions per annum Poisson randomness is around ± 17 admissions (one standard deviation) and this only explains the slight background spikes in the trend lines. It cannot in any way explain the very large deviations which dominate the trends. Likewise it would take rapid and catastrophic changes in the demographic structure of each MSOA to come anywhere near to explaining these large deviations – such changes have not occurred. Neither can weather be implicated since the MSOA are within short distances from each other.

An edited version of this article has been published as: Jones R (2015) Forecasting medical emergency admissions. ***British Journal of Healthcare Management*** 21(2): 98-99. Please use this to cite.

Figure 1: Running 12-month total medical emergency admissions (2008 to 2013)



The only valid explanation is that a series of infectious events has swept through these small communities and left a history of changes in medical admissions. Recall that in a running 12 month total chart a step-like change in admissions will create a ramp up or down. A primary infectious basis for emergency admissions can be discerned from the fact that ambulance call-out rates increase with population density (Peacock & Peacock 2006).

Any mother will confidently inform you that nursery and infant schools act as a hot bed for infectious spread. Respiratory infections in elderly members of the population are known to be more prominent in areas where there is exposure to young children, who act as carriers to infect their older relatives (Adler et al 2014). At the other end of the scale nursing homes can act as a locus for infectious spread among the frail elderly residents (Jones & Beauchant 2015). It may be no coincidence that MSOA E02003365, which exhibits the most extreme behavior, contains 3 nursing homes (Jones & Beauchant 2015). Indeed just as in Fig. 1, all infectious outbreaks are known to be highly granular, outbreak severity can vary enormously from one location to another (Farnsworth & Ward 2009)

In conclusion, you are welcome to continue to use demography in your attempts to forecast medical admissions, but please do not be naive enough to expect others to believe any of the

An edited version of this article has been published as: Jones R (2015) Forecasting medical emergency admissions. ***British Journal of Healthcare Management*** 21(2): 98-99. Please use this to cite.

forecasts, nor should you base financial projections on such a dubious basis. Can I also suggest that any attempts to reduce emergency admissions will need to take this fundamental infectious basis into account, i.e. your aim is to shift the baseline for emergency admissions downward to the point that the infectious outbreaks are no longer a financial challenge (although their cost may be transferred elsewhere). Has our thinking been so constrained that we have failed to see the obvious (Jones 2015). At the end of the day you cannot control what you do not understand.

References

Adler A, Eames K, Funk S, Edmunds W (2014) Inciodence and risk factors for influenza-like-illness in the UK: online surveillance using Flusurvey. BMC Infect Dis 14: 232

Farnsworth M, Ward M (2009) Identifying spatio-temporal patterns of transboundary disease spread: examples using avian influenza. Vet Res 40(3): 20.

Jones R (2010) Myths of ideal hospital size. Med J Aust 193(5): 298-300.

Jones R (2015) Recurring Outbreaks of an Infection Apparently Targeting Immune Function, and Consequent Unprecedented Growth in Medical Admission and Costs in the United Kingdom: A Review. Brit J Med Medical Res 6(8): 735-770.

Jones R, Beauchant S (2015) Spread of a new type of infectious condition across Berkshire in England between June 2011 and March 2013: Effect on medical emergency admissions. Brit J Med Medical Res 6(1): 126-148.

Peacock P, Peacock J (2006) Emergency call work-load, deprivation and population density: an investigation into ambulance services across England. J Public Health 28(2): 111-115.