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Seasonality and volatility affect staff workload

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The original can be obtained from www.bjhcm.co.uk using an NHS Athens login.

Seasonality and volatility affect staff workload and costs in STPs

Key Points

- The last year of life accounts for up to 55% of a person's lifetime use of a hospital bed
- The last month is the most bed intensive
- A count of deaths per month is a good proxy for resource consumption
- Both hospital admissions, and deaths per month show seasonal and environment-based volatility

Introduction

Sustainability and Transformation Plans (STPs) have been introduced in England to enable health and social care to reduce the burden of acute care and reduce overall costs (Kings Fund 2016). As with any new venture unexpected challenges will emerge. Based on a 25-year career in capacity planning and demand forecasting may I offer some suggestions regarding the thorny issues of seasonality and volatility in the context of health and social care staffing in the brave new world of STPs.

Acute Beds

Firstly, although somewhat maligned these days, the local acute hospital does have the advantage that it is relatively large, i.e. it reaps the benefit of economy of scale and thereby minimises volatility (Jones 2004, 2009, 2011, 2012a-c, 2013). Acute hospitals have unknowingly become the place of default when the smaller local health and social care systems become overwhelmed due to seasonal variation in demand, plus the intrinsically high volatility in health care demand (Jones 2013). Cutting acute beds beyond that which is sensible is the quickest route to a Chernobyl style meltdown, since high bed occupancy is linked with every conceivable measure of poor performance, staff wellbeing and care (Beeknoo and Jones 2017).

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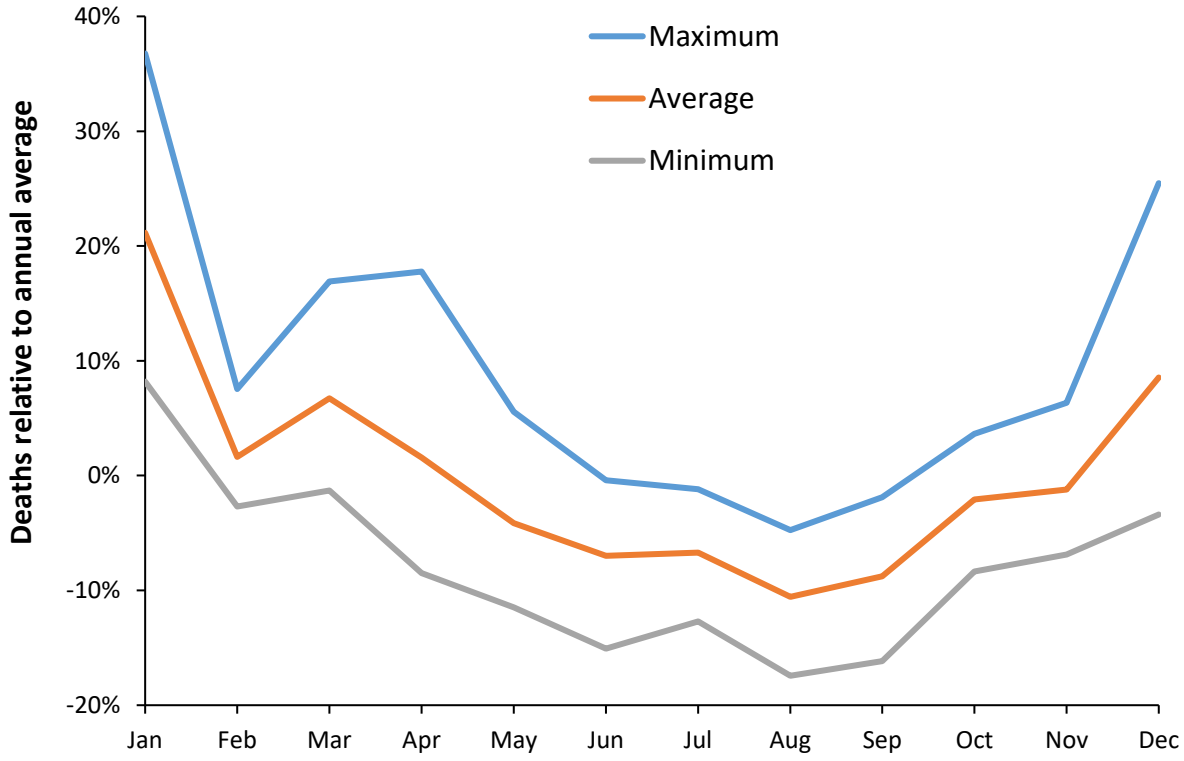
Seasonal Patterns

However, warnings aside, seasonal patterns in the incidence of most common medical conditions are well-recognised (Flemming et al 1991), and appear linked to seasonal patterns in gene expression (Dopico et al 2015). For 'seasonal patterns' read 'workload patterns'.

During the last months of life (irrespective of chronological age) demand for medical intervention rapidly increases, especially, in the last 22 weeks of life. Demand reaches a crescendo in the last month of life (Beeknoo and Jones 2016).

A count of deaths per month (as opposed to age standardized mortality) is therefore a good proxy for end-of-life care demand (Jones 2011).

Figure 1: Monthly deaths in England and Wales relative to the annual average (2001 to 2016)



Source: Monthly deaths by area of residence in England and Wales is from the Office for National Statistics. Proportion adjusted to same days equivalent per month.

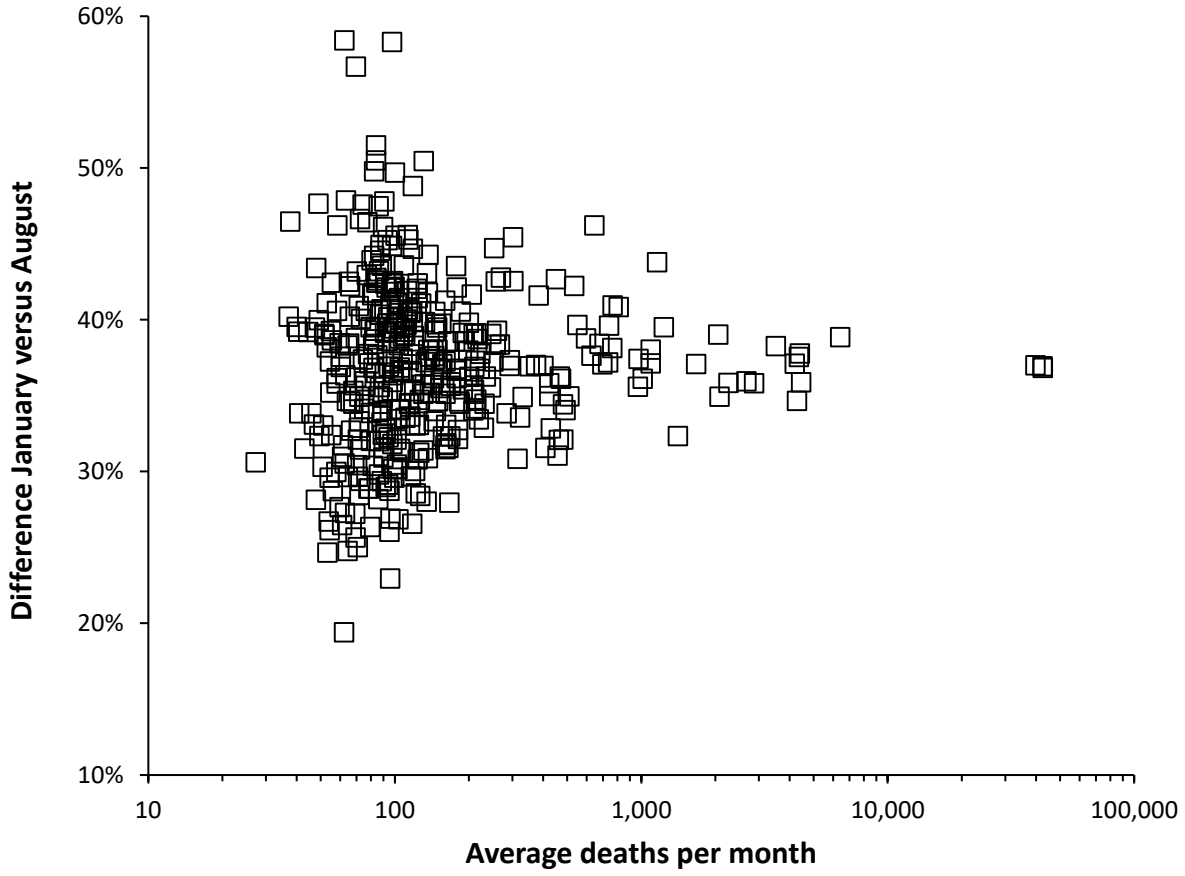
Figure 1 therefore shows the pattern of deaths in England and Wales for each month relative to the annual average over a 16-year period (2001-2016). Data for each month includes the maximum, average and minimum for the 16-year period. I assume that all STPs have factored into their staffing calculations the need for (on average) 38% more staff time in January compared to August to deal with issues related to end-of-life, and the need for the huge flexibility in staffing implied by the variation between years? As can be seen in Fig. 1 highest year-to-year volatility

occurs in Jan/Dec and this is 3-times higher to that seen in Feb/Jul/Oct. Also recall that deaths occupy a far greater proportion of total health and social care workload in older populations such as popular retirement locations (Jones and Beeknoo 2017).

Intrinsic Volatility

Clearly Figure 1 is a national average, hence Figure 2 looks at the variation in the ratio of August to December deaths for all local authorities in England and Wales. Figure 2 is still a 16-year average, i.e. the range for each year is vastly higher (as in Fig. 1). The range between local authorities partly reflects metrological and infectious volatility across different parts of England and Wales, plus additional volatility due to size (Jones 2012a-c). It goes without saying that the year-to-year volatility is very high, as per Fig. 1 (Jones 2004, 2009, 2011, 2012a-c). I am likewise assuming the costs (including overtime) associated with these wildly fluctuating levels of staff input (from both health and social care) have been factored into the STP. Staff sickness absence peaks at the same time as deaths, indicating that common infections are sufficient to instigate the final step in the end-of-life time cascade (Jones 2015). Recall that in the past, the patient (along with all the blame) could be dumped onto the local hospital.

Figure 2: Average increase in deaths, January versus August, in regions and local authorities within England and Wales (2001 to 2016)



Source: As per Fig. 1

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Conclusion

Given that the last year of life consumes somewhere around 55% of a person's lifetime hospital bed requirements [9], the suspicion is that volatility in the absolute number of deaths is going to become a key measure for healthcare resource costs.

As always, there are unanticipated consequences of policy. This short article is not a criticism of STPs, nor a call to remain in the past. It simply points out that it is never wise to ignore the unescapable consequences of reality.

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Provenance

Dr Rodney Jones has over 25-years' experience in health care demand forecasting and capacity planning. He has published over 200 papers in this area including bed planning and the financial risk in health care commissioning.