

An edited version of this article has been published as: Jones R (2009) Length of stay efficiency. British Journal of Healthcare Management 15(11): 563-564. Please use this as the citation.

## Length of stay efficiency

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The previous article in this series investigated the evidence to support the generally smaller size of hospitals built in recent years. Bed demand was demonstrated to be roughly the same as ten years ago (Jones 2009b). This observation may conflict with the generally perceived notion that average length of stay (LOS) is declining and therefore hospitals need to be smaller. We need to understand the issues involved in this apparent conflict of 'reality' although (as a hint) it must be pointed out that genuine 'inpatient' LOS reduction has been minimal in the USA over the past 10 years (Nataraja et al 2009).

Figure 1 summarises the net change in both overnight stay admissions (activity) and occupied bed days over the past 10 years using trends in diagnoses as defined by the 148 summary groups in the International Classification of Diseases (ICD) to illustrate the issues. The ICD summary groups are a useful high level aggregation, for example, codes B15-19 cover viral hepatitis, L20-30 dermatitis and eczema, etc. In the UK all hospital admissions receive an ICD diagnosis code. As can be seen the bulk of diagnoses fall into the quadrant where there are both increases in activity and occupied bed days. Most lie beneath the line of constant length of stay (LOS) and hence have seen a reduction in average LOS. It must however be pointed out that a large proportion lie close to the line of constant LOS indicating only modest changes in LOS over the ten year period and 40% of the diagnosis groups have either shown no change in average LOS or an increase. The remaining 60% have shown either a small to large reduction in apparent average LOS.

The word 'apparent' is used to indicate that it is possible that the decrease may be an illusion based on the way the average is calculated. Figure 2 gives insight into this issue by giving the trend in zero day stay admissions before and after the introduction of the accident & emergency (A&E) four hour waiting time target. As can be seen the introduction of the target resulted in a flood of zero day stay 'admissions' (Jones 2009a). In the USA such 'admissions' are not counted as an inpatient admission and are paid under a separate ambulatory emergency department tariff (Nataraja et al 2009). In England these have been counted as an 'admission' simply to avoid the four hour target which in itself has been very beneficial to those with minor injuries but is often inappropriate to the process of diagnosis and observation for a range of conditions where ultimate admission may be an option.

This has however added some 612,000 zero day 'admissions' into the data for England in the ten year period 1998/99 to 2006/07. Additional zero day admissions will also have occurred in a range of paediatric, surgical and obstetric assessment/observation units and we are probably talking about an extra 800,000 to 1,000,000 being added into the denominator of the calculation of average LOS. This equates to a 7.5% reduction in the average LOS across every diagnostic group for elective and emergency admission or is sufficient to displace all the diagnostic groups in Fig 1 with a high apparent LOS reduction back to the 20% reduction line shown on this chart.

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Table 1 shows those diagnoses where there has been a large reduction in the median LOS. The median is the mid point in all the ranked LOS of all admissions and hence in a group where there are a large number of zero's added at the front of the rank the median will be shifted to a lower LOS. As can be seen this group is largely comprised of typical A&E type attendances where something more than simple rapid treatment is involved.

Hence we are left to conclude that the real reduction in genuine inpatient LOS over the past 10 years has been lower than at first appears and on average has only been sufficient to keep pace with the increase in genuine inpatient overnight stay admissions. Hence the former observation that real acute bed demand has remained reasonably static (Jones 2009b).

Given the huge input into improved efficiency over the last ten years the prospect for the next ten years is not only more of the same for the acute sector but also an absolute imperative that wide scale admission avoidance, expert patient programmes, identification of patients at risk of admission, etc via vastly improved primary care becomes the norm rather than the exception. Without this the prospect of smaller acute hospitals will remain as illusive as ever. It remains to be seen whether extracting greater cost efficiency out of the acute sector will be sufficient to fund this necessary revolution in care.

## References

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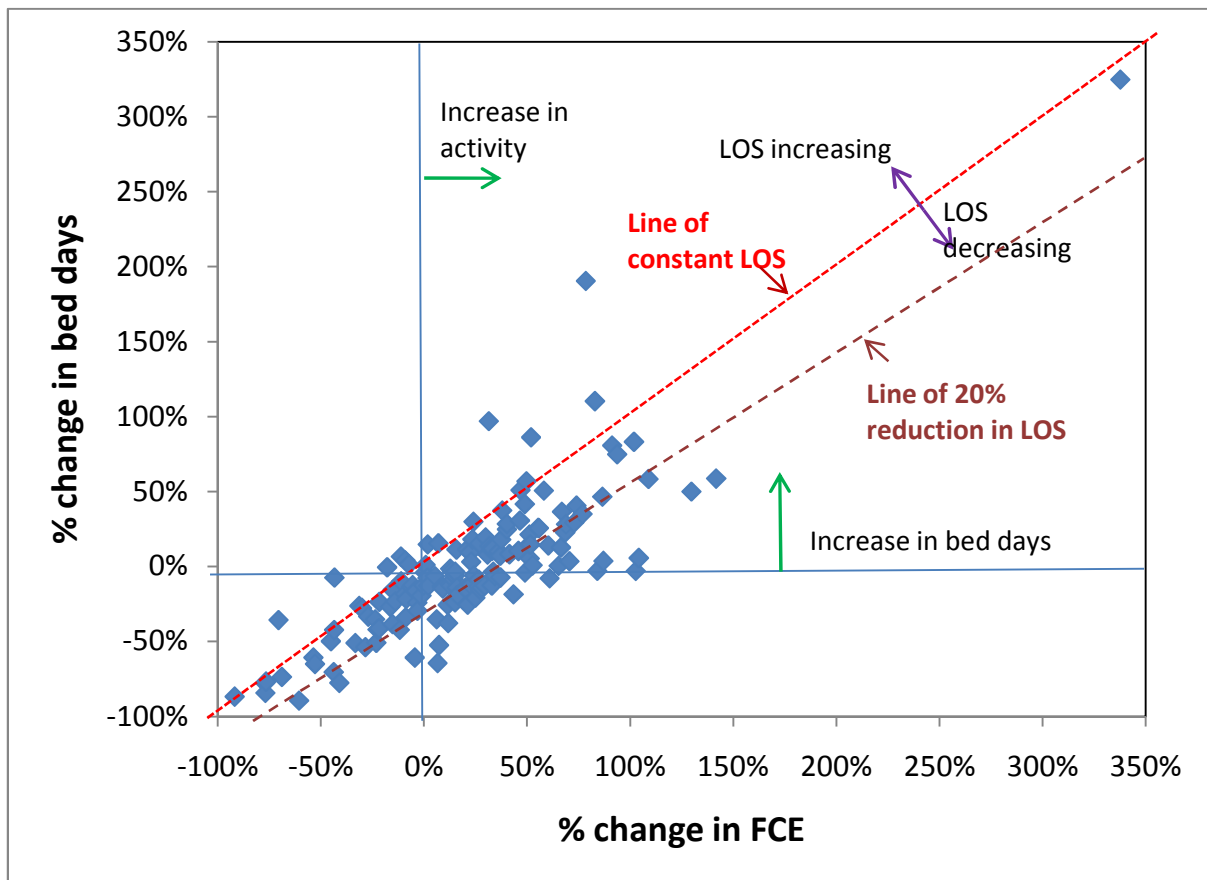
**Table 1: Diagnoses showing a large reduction in the median length of stay**

Group	Description	1998/99	2007/08
A65-A79	Other infectious and parasitic disorders	4	1
F10-F19	Mental and behavioural disorders - psychoactive substances	6	2
G50-G73	Other diseases & disorders of the nervous system	5	2
G80-G83	Cerebral palsy & other paralytic syndromes	13	3
J20-J22	Other acute lower respiratory infections	5	2
L20-L30	Dermatitis and eczema	4	1
L50-L54	Urticaria and erythems (hives, irritation, etc)	1	0
N40-N51	Diseases of male genital organs	3	1
R20-R23	Symptoms & signs of the skin/subcutaneous tissue	1	0
R25-R29	Symptoms & signs of the nervous/musculoskeletal system	7	2
R40-R46	Symptoms & signs in cognition, perception etc.	5	1
R95-R99	Ill-defined & unknown causes of mortality	4	0
T33-T35	Frostbite	5	2
T51-T65	Toxic effects of non-medicinal substances	1	0
T66-T78	Other and unspecified effects of external causes	1	0
Z00-Z13	Examination and investigation	1	0
Z20-Z29	Potential health hazards related to communicable diseases	1	0
Z40-Z54	Persons encountering health services for specific care	3	1
Z55-Z65	Potential health hazards - socioeconomic/psychosocial	5	1
Z70-Z76	Persons encountering health services in other circumstances	7	2
Z80-Z99	Persons with potential health hazards related to family	2	1

Footnote: Median LOS in days. Data is from HES as per Fig 1.

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**Figure 1: Net change in bed days and overnight stay activity over the past 10 years**

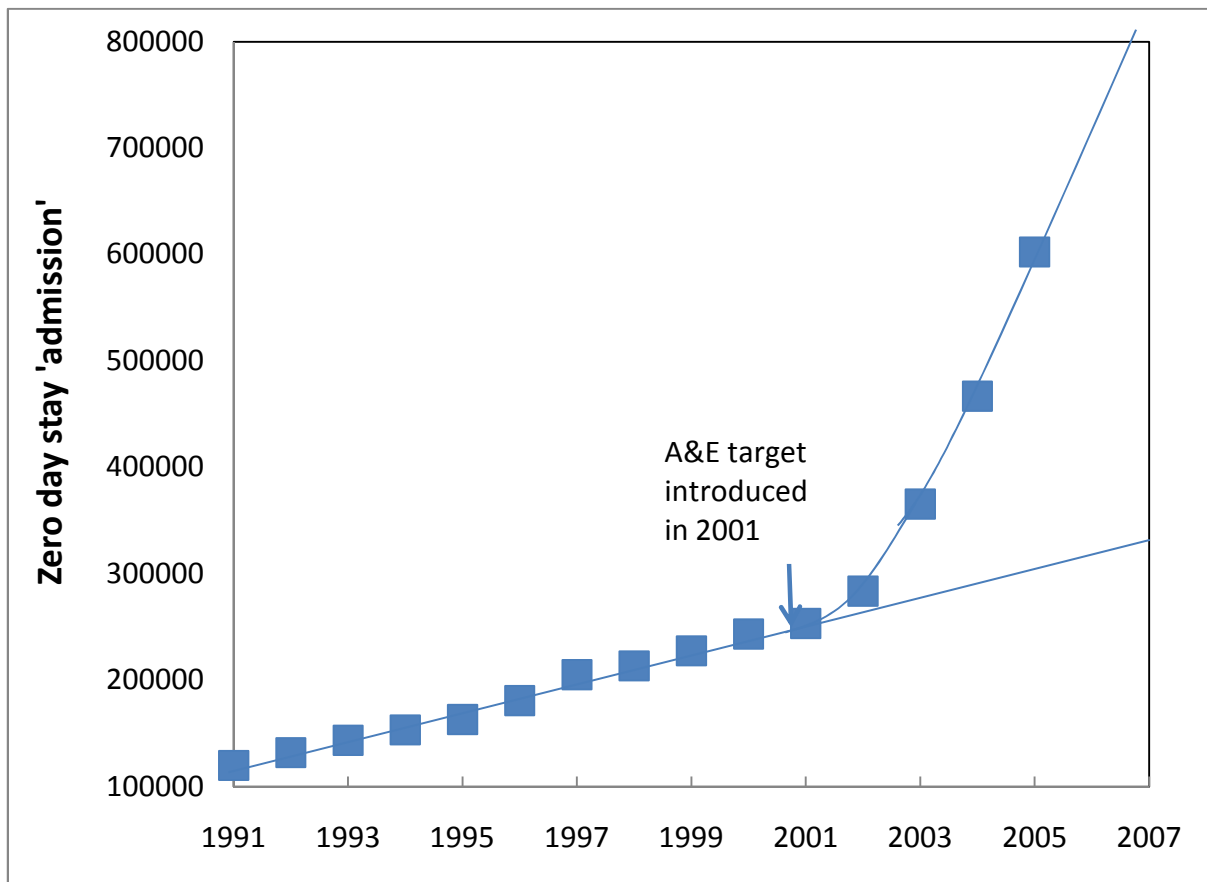


Footnote: Data is from Hospital Episode Statistics (HES)

(<http://www.hesonline.nhs.uk/Ease/servlet/ContentServer?siteID=1937&categoryID=202>) and uses 148 summary level groupings of ICD primary diagnoses. Change is over the period 1998/99 to 2007/08. Overnight stay activity excludes day case admissions. The division between elective and emergency has been ignored.

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**Figure 2: Zero day stay emergency admissions for England**



**Footnote: Data was extracted from HES and covers zero day stay admissions to medical or accident and emergency assessment/observation units (Jones 2009a).**