

# Maternity length of stay efficiency and neonatal admissions

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## Key Points

- LOS is not always a measure of efficiency
- Congress in the USA had to stipulate a minimum LOS to protect mothers from too rapid discharge following birth
- Some 41% of maternity admissions in England are discharged on the same day as admission
- This has distorted the calculation of maternity average LOS
- The number of neonatal admissions per 1,000 births in England rapidly rose after 2004/05 when the real maternity LOS dropped below 1.8 days
- Costs have simply been shifted to another specialty

Everyone in the UK NHS 'knows' that a shorter length of stay (LOS) is a 'good' measure of 'efficiency'. Hence, we benchmark everyone against LOS and castigate the inefficient wasters at the bottom of the ranking.

LOS does, however, greatly depend on the ability to discharge patients into the surrounding non-acute environment which includes hospices, nursing homes, step-down facilities in community hospitals, community nurses supporting in-home care, transfers to specialist hospitals and dedicated rehabilitation facilities. In this case international and national hospital LOS 'efficiency' is a debatable term (Jones 2009, 2010, 2013), and most doctors would rightly point out that patients are generally not kept in hospital any longer than is necessary.

In the early 1990's maternity units in the USA came under intense pressure from insurance companies to reduce LOS, on the basis that one extra day cost more, i.e. the cost apportionment fallacy (Jones 2013b). As a result, LOS reduced very rapidly to the point that mother and baby were exposed to high risk of out-of-hospital complications. In 1996 Congress was forced to pass legislation which stipulated a minimum stay of 48 hours

following vaginal delivery and 96 hours following a caesarean section, unless by agreement of physician and mother (National Conference of State Legislatures 2012).

Some 41% of all maternity 'overnight' admissions in England are same day stay – see Table 1 for a sample of diagnoses accounting for the most maternity beds. This arises as a quirk of the definition of an 'overnight' admission, within the NHS Data Dictionary, which assigns an overnight classification to anything not an elective day case irrespective of length of stay (NHS Digital 2017). These same day admissions arise from the role of maternity units as an 'assessment unit' for events occurring during pregnancy such as excessive bleeding and other medical complications.

However, the problem arises in that all these same day stay admissions are attributed a zero day stay in the calculation of average LOS (Jones 2017). To this end Fig. 1 shows the 'official' average LOS for English maternity units and an estimate of the real LOS for those patients who stay overnight. This is achieved by attributing a notional LOS of 0.5 days to the count of all zero day stay admissions which is then added into the numerator.

**Table 1: Top 15 diagnoses for pregnancy and childbirth ranked by number of occupied beds in England**

ICD-10	Description	Occupied Beds	Average real LOS	Change in LOS since 99/00	Change in LOS since 07/08	Same day stay (%)
O68	Labour and delivery with fetal stress	859	2.9	-0.3	0.2	4%
O70	Perineal laceration during delivery	630	1.5	-0.5	-0.1	21%
O36	Maternal care for other fetal problems	523	1.1	-0.1	0.2	69%
O63	Long labour	380	3.2	-0.2	0.3	2%
O34	Maternal care for abnormality of pelvic organs	305	2.1	-1.9	-0.6	9%
O26	Maternal care for other conditions	279	1.0	-0.1	0.1	67%
O32	Maternal care for malpresentation	226	2.4	-1.6	0.0	22%
O42	Premature rupture of membranes	220	1.7	-1.2	0.0	39%
O72	Postpartum haemorrhage	140	2.3	0.1	-0.1	16%
O14	Gestational hypertension with proteinuria	134	4.4	-0.6	0.2	15%
O99	Other maternal diseases	134	1.3	0.0	0.2	51%
O24	Diabetes mellitus in pregnancy	123	2.4	-0.7	0.4	19%
O80	Single spontaneous delivery	119	1.1	-0.8	-0.2	35%
O60	Preterm delivery	116	3.5	-1.4	-0.7	9%
O21	Excessive vomiting in pregnancy	114	1.3	-1.5	-0.8	30%
O46	Antepartum haemorrhage	104	1.3	-0.5	0.1	47%
O04	Medical abortion	98	0.7	0.1	0.1	86%
O03	Spontaneous abortion	92	0.9	-0.2	0.0	63%
O62	Abnormalities of forces of labour	92	3.0	-0.1	0.6	9%
O48	Prolonged pregnancy	82	1.8	-0.6	-0.2	19%
O44	Placenta praevia	77	4.0	-5.1	-2.2	13%

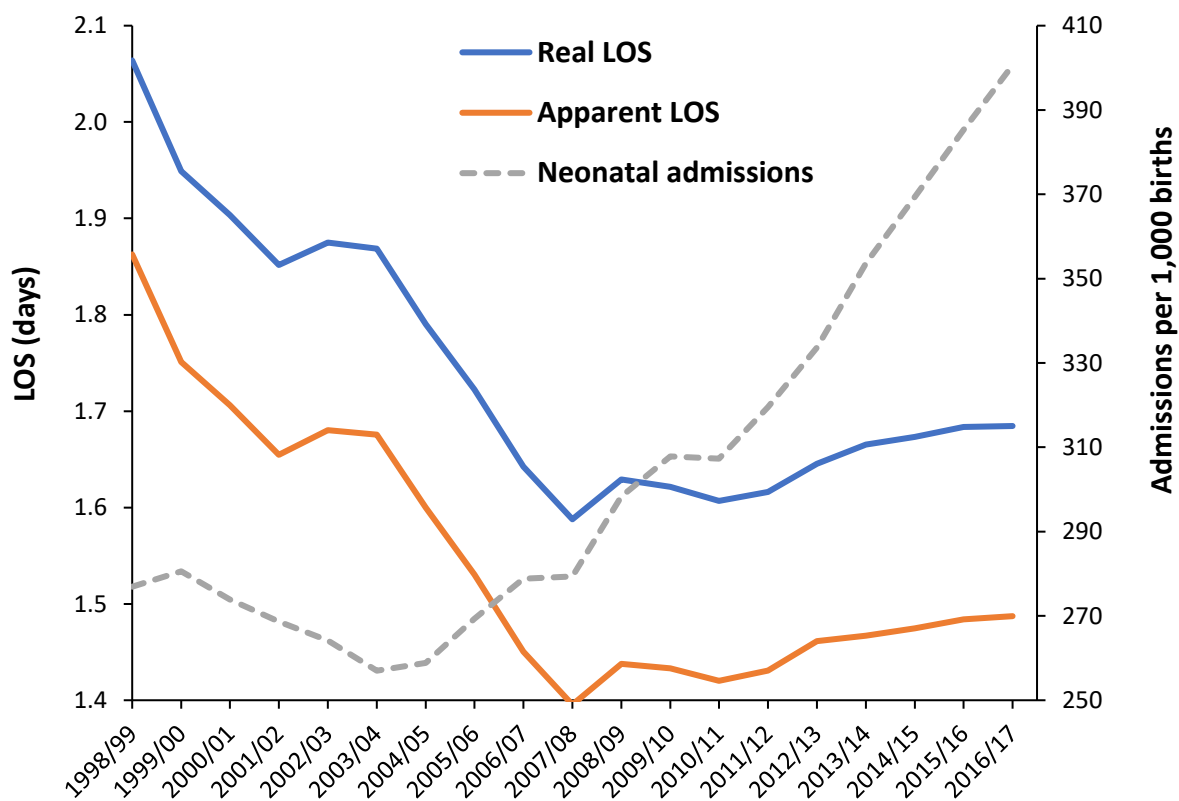
Footnote: Data is from Hospital Episode Statistics (NHS Digital 2017a) and covers the years 1998/99 to 2016/17. Occupied beds, Average real LOS and Same day stay are an average of 2015/16 and 2016/17. Change in LOS is in days. A direct count of same day admissions is available from 2013/14 onward. Same day admissions have been apportioned to the prior years based on total admissions.

As can be seen the real LOS is about 0.2 days higher than the official figure. Also, that average LOS has not fundamentally changed since 2007/08 and is increasing in recent years.

The key point here is that the real average LOS needs to be used to calculate overnight occupied beds, while an accurate measure of same day LOS, in hours and minutes, needs to be used to calculate the additional beds to accommodate these patients (Tierney and Conroy 2012).

The national average occupancy margin (calculated at midnight), which excludes same day stay admissions, is therefore a gross underestimate of the true situation. Disastrously undersized maternity units can then be built based on such fallacious figures.

**Figure 1: Apparent and real average LOS for maternity units in England and associated neonatal admissions per 1,000 births**



Footnote: Data is from HES (NHS Digital 2017a). A direct count of same day admissions is available from 2013/14 onward. Same day admissions have been apportioned to the prior years based on total admissions.

As in the USA, the impact of over-enthusiastic reduction in maternity LOS can be discerned in Figure 1 where neonatal admissions per 1,000 births escalates at the point where the real LOS drops below 1.9 days. These have been termed 'boomerang babies' (Sacchetti et al 1997), and simply shift costs to somewhere else in the system.

In conclusion, average LOS in English maternity units probably needs to revert back to 1.9 days to prevent excessive re-admission of neonates. The use of LOS as a blunt efficiency measure only creates false comparisons and can lead to more harm than good.

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