

Trend in proportion of deaths occurring in hospital

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There is now increasing evidence that the last three to four months of life entails increasingly futile periods of medical, surgical and critical care (Jones et al 2016, Beeknoo and Jones 2016). However, the proportion of persons dying in hospital shows wide variation between health care systems from around 62% in Australia to around 30% in the Netherlands and Oregon in the US (Cohen et al 2008, Rosenwax et al 2011, Tolle et al 1999). Up to 55% of lifetime acute and mental health bed utilization and 42% of admissions may occur in the last year of life (Hanlon et al 1998). Bed utilization in the last six months of life likewise varies considerably between health care systems (Wennberg et al 2004) and due to the cause of death (Rosenwax et al 2011).

Understandably, there has been greater emphasis on end-of-life care to avoid futile acute expenditure, and to improve patient experience (Foote et al 2008, Leadbeater and Garber 2010, Tolle et al 1999). Given the fact that deaths across England are projected to rise by 17% in the period to 2030, and that home deaths are projected to fall due to changes in cancer and non-cancer deaths (Gomes and Higginson 2008), it is becoming increasingly important that we monitor the trends in end-of-life care which avoid hospital admission. While measures such as the ratio of bed days per death or admissions per death can be used to track progress (Beeknoo and Jones 2016), another fundamental measure is the proportion of deaths which occur in hospital.

Figure 1 shows the trend in deaths occurring in hospital, including persons dying within 30 days of discharge, in England for a series of 12-month snapshots commencing at the 2010/11 financial year. Since this data also includes deaths within 30 days of discharge it provides a better estimate of acute usage in the last month of life.

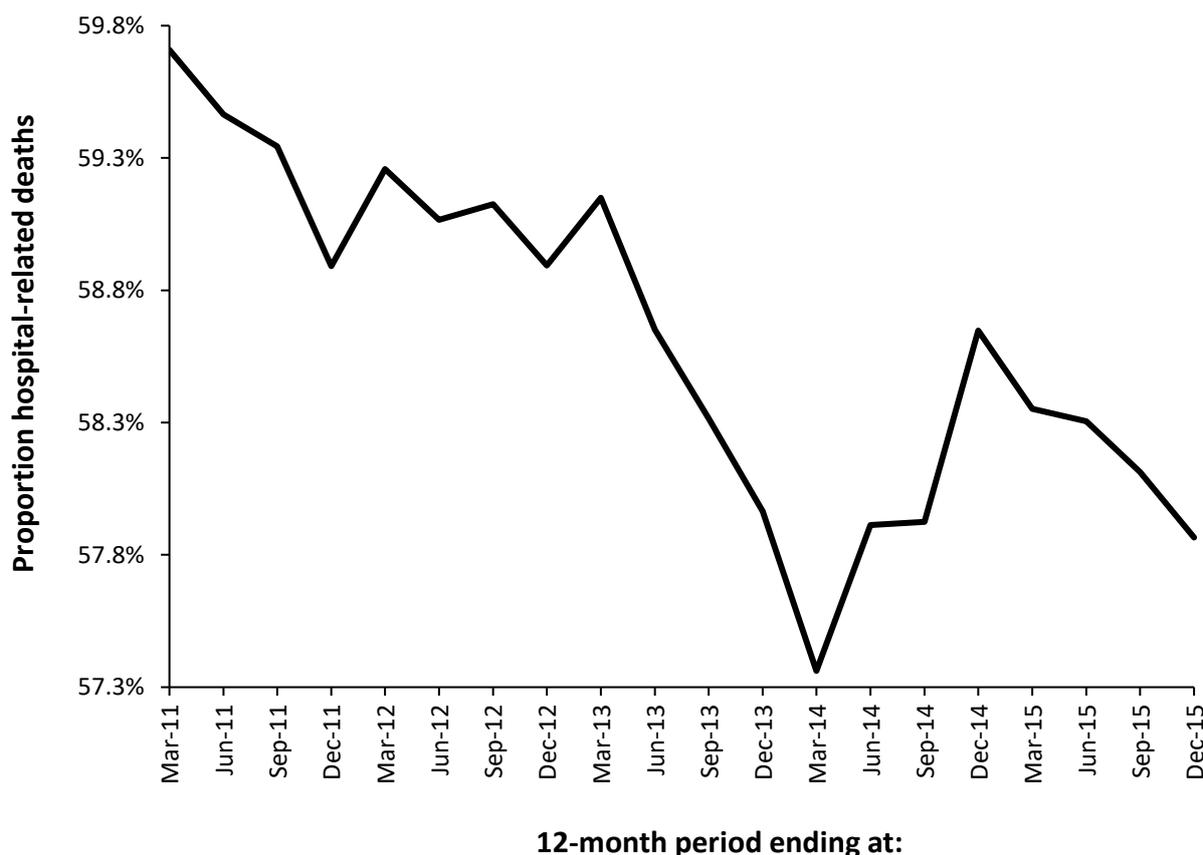
As can be seen there is a general trend downward from 59.8% in 2010/11 to 57.8% projected for 2015/16, however, the trend downward appears to have slowed in more recent years. The somewhat jagged nature of the trend requires explanation. In a running 12-month total a sudden and unexpected step-change leads to saw-tooth behaviour in the trend. During the time-period covered in Figure 1 there is a step-down following an event in 2010. Hence the proportion dying in hospital reaches a maximum during the period April 2010 to March 2011. The effect of the agent ceases and deaths immediately drop to around 58.8% in hospital for the 12-months January 2011 to December 2011. Start and end dates are not sharply defined because the SHMI data increments in a quarterly manner. Another event commencing after December 2011 is partly obscured by the underlying downward trend in the proportion dying in hospital, however, at the cessation of this

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event deaths in hospital finally reach a minimum of 57.3% during the period April 2013 to March 2014. Another event then ensues and deaths in hospital jump to 58.6% for the 12-month period January 2014 to December 2014.

A further outbreak of this agent in 2016 is anticipated to cause another step-like increase in the proportion of deaths occurring in hospital in the second half of 2016 and first half of 2017 (Jones 2016e).

Figure 1: Trend in the proportion of deaths occurring in hospital or within 30 days of discharge in England



Footnote: Data comes from the Summary Hospital Mortality Indicator (SHMI) series available from NHS Digital (<http://content.digital.nhs.uk/SHMI>). Monthly deaths in England were obtained from the Office for National Statistics (<http://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/monthlyfiguresondeathsregisteredbyareaofusualresidence>), and were used to calculate deaths in the periods available for the SHMI Data.

These 'events' behave like an infectious outbreak of a relatively difficult to transmit agent (Jones 2015a-c, 2016a-e, and during the infectious phase (typically lasting around 12 months) persons suffering from Alzheimer's and dementia experience the greatest mortality (Jones 2016d).

In conclusion, an encouraging trend downward in the proportion of deaths in hospital appears to have slowed possibly in response to the pressures forecast by Gomes and Higginson (2008). However, a regular series of outbreaks of a presumed infectious agent leads to 12 month periods where death in hospital is around 1% point higher, and with associated higher health and social care costs (Jones 2015c).

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