

## 5.4 Invasive mechanical ventilation

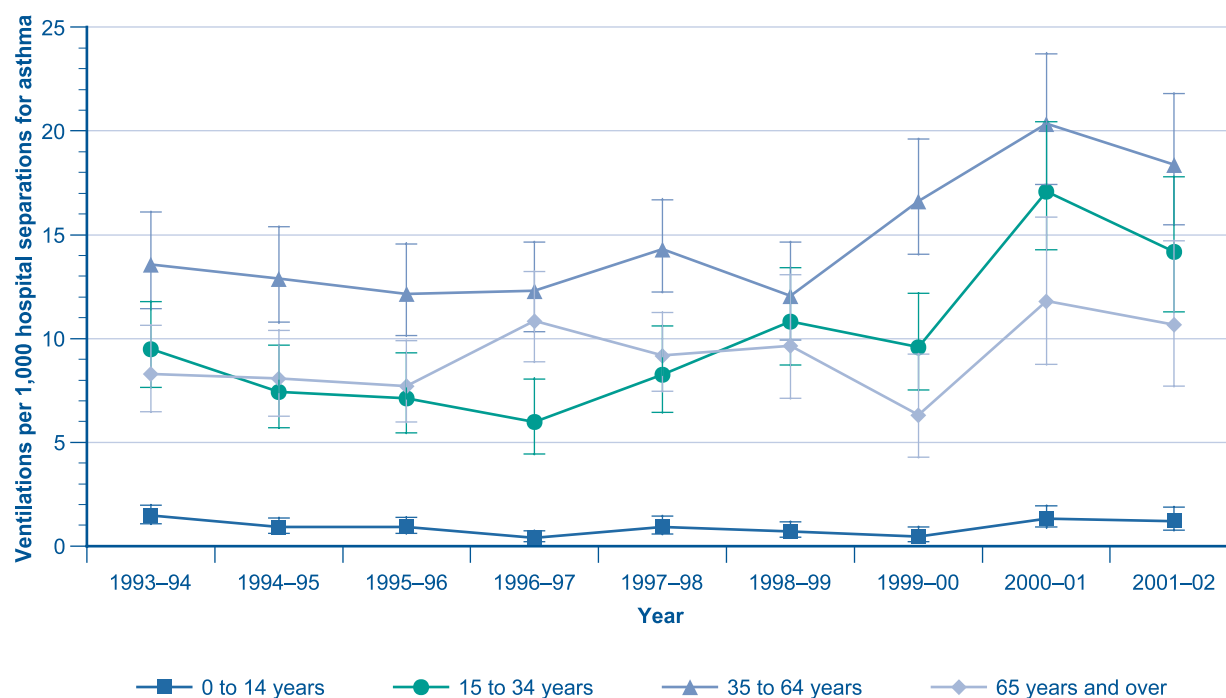
A small proportion of people with severe exacerbations of asthma either stop breathing altogether or decrease their breathing to such an extent that they are at risk of stopping breathing. This represents a severe, imminently life-threatening event and can only be averted by the introduction of artificial mechanical ventilation, via an endotracheal tube attached to a positive pressure ventilator ('life support machine'). This procedure is sometimes referred to as invasive mechanical ventilation to distinguish it from a non-invasive form of ventilation that is used in less severe circumstances. Monitoring trends and differentials in the occurrence of this event, which is routinely recorded in hospital statistics, provides insights into the epidemiology of severe, life-threatening asthma and, possibly, asthma deaths (Kolbe et al. 2000). However, in interpreting these trends it is important to recognise that criteria for intubation and the use of invasive ventilation may vary over time and between institutions. In particular, policies in relation to the use of non-invasive ventilation as a means of averting the need for intubation will have influenced rates of invasive mechanical ventilation.

Within the National Hospital Morbidity Database, information is included about procedures during hospital care. This section presents data relating to the use of invasive mechanical ventilation that have been derived from this database.

### Time trends in invasive mechanical ventilation for asthma

During the period 1993–94 to 2001–02, the number of people aged 15 years and over who required invasive mechanical ventilation decreased from 284 to 250. However, as the overall hospitalisation rate for asthma decreased substantially during this period, the proportion of adults admitted with asthma who required invasive mechanical ventilation increased from 12.0 to 18.4 per 1,000 during this period (Figure 5.36). This increased rate of invasive mechanical ventilation among admitted patients may reflect an increase in the average level of severity in patients who are admitted. Alternatively, or additionally, it may also reflect a greater propensity to offer invasive ventilation to patients with asthma with severe ventilatory failure.

**Figure 5.36**  
Proportion of hospital separations for asthma with invasive mechanical ventilation, by age group, Australia, 1993–2002



Note: Same day separations excluded. Asthma classified according to ICD-10-AM codes J45 & J46.

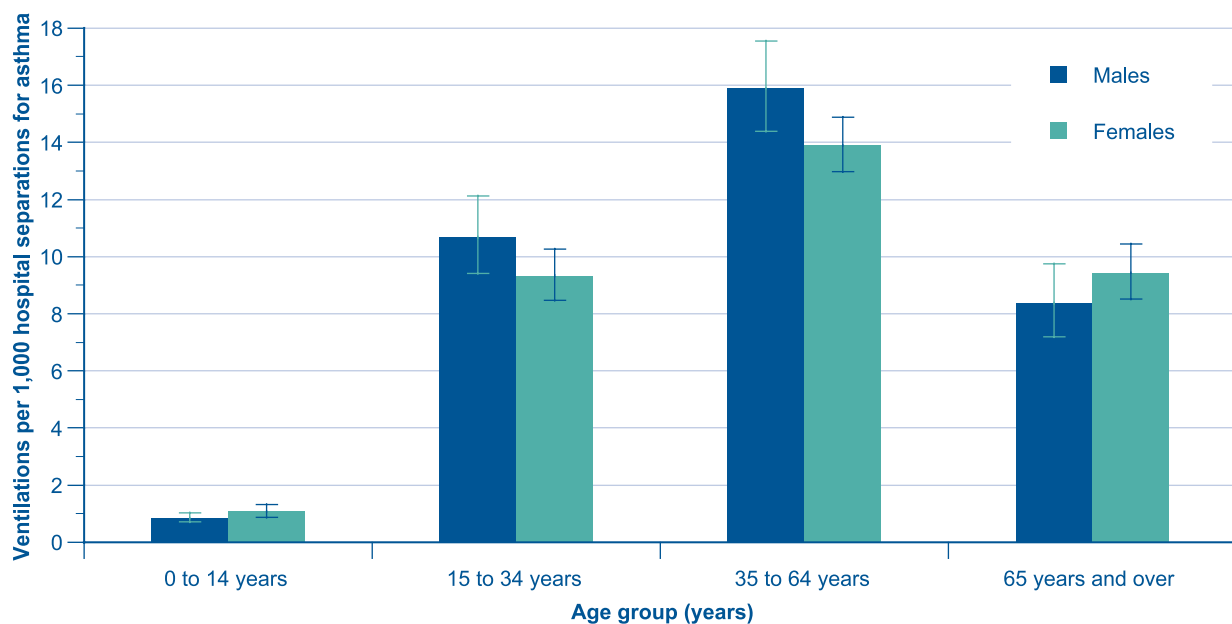
Source: AIHW National Hospital Morbidity Database.

## Differentials in invasive mechanical ventilation for asthma

### Age and sex

The highest proportion of hospital separations for asthma that were associated with a period of invasive mechanical ventilation was among 35 to 64 year old adults (Figure 5.37). The slightly lower rate of invasive ventilation among older persons may reflect a lower average level of severity among separations in this age group. However, an active decision on the part of patients, families and clinicians not to instigate invasive mechanical ventilation in certain patients approaching the end of life may also have contributed to this trend. There were no major differences between males and females in the propensity to use invasive mechanical ventilation.

**Figure 5.37**  
Rate of hospital separations for asthma with invasive mechanical ventilation, by age group and sex, Australia, 1993–2002



Note: Same day separations excluded. Asthma classified according to ICD-10-AM codes J45 & J46.

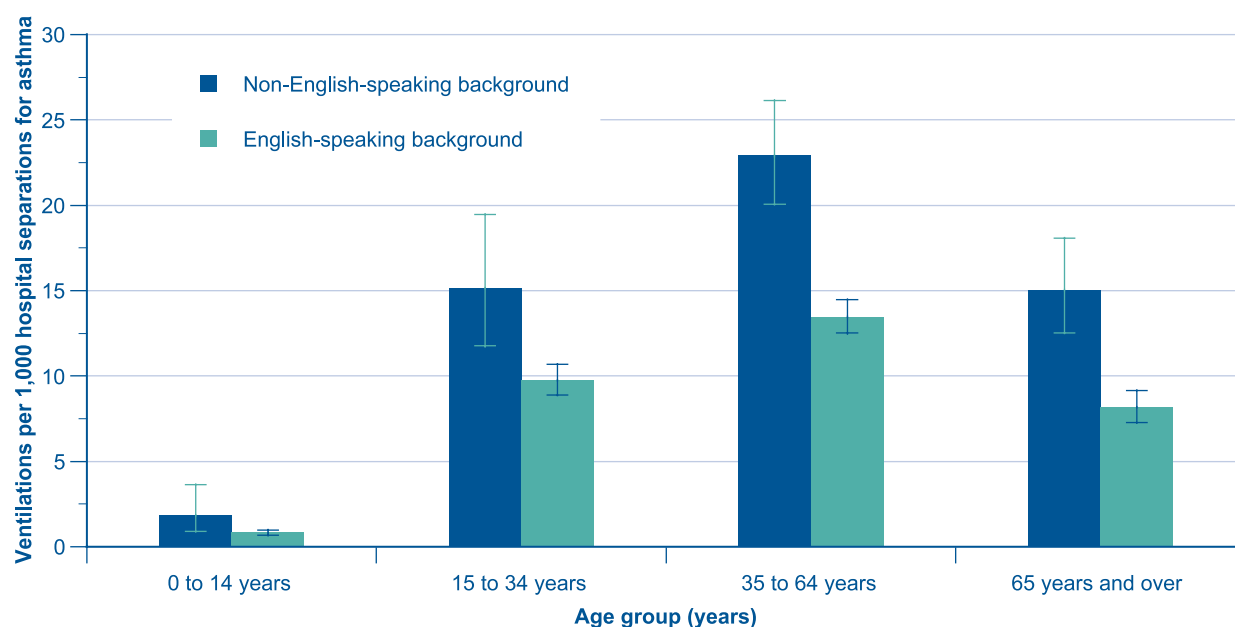
Source: AIHW National Hospital Morbidity Database.

### Culturally and linguistically diverse background

Persons of non-English-speaking background were more likely to require invasive mechanical ventilation during a hospital separation for asthma than English-speaking persons (Figure 5.38). This higher rate of ventilation for asthma is consistent with the higher case-fatality rate among persons of non-English-speaking background. Both these adverse outcomes may reflect more severe disease and, possibly, delayed institution of effective treatment for exacerbations in persons of non-English-speaking background.

**Figure 5.38**

**Rate of hospital separations for asthma with invasive mechanical ventilation, by age group and English-speaking versus non-English-speaking background, Australia, 1995–2002**



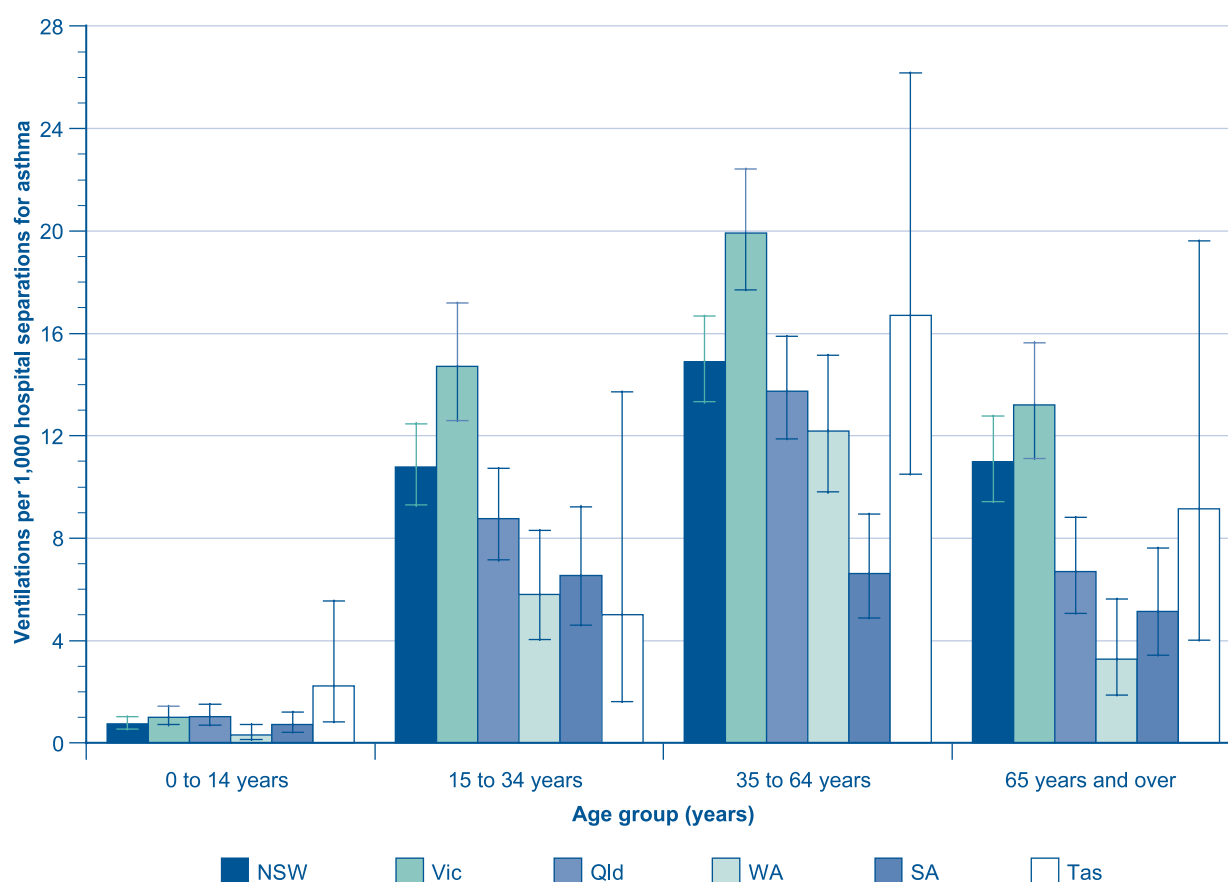
Note: Same day separations excluded. Asthma classified according to ICD-10-AM codes J45 & J46. For definition of non-English-speaking background and English-speaking background see Glossary.

Source: AIHW National Hospital Morbidity Database.

## States and territories

There were some differences between states and territories in the proportion of persons admitted with asthma who received a period of invasive mechanical ventilation (Figure 5.39). The proportion was highest in Victoria and lowest in South Australia.

**Figure 5.39**  
Rate of hospital separations for asthma with invasive mechanical ventilation, by age group and state and territory, Australia, 1995–2002



Note: Same day separations excluded. Asthma classified according to ICD-10-AM codes J45 & J46. Northern Territory and Australian Capital Territory not shown because numbers too small to produce reliable estimates.

Source: AIHW National Hospital Morbidity Database.

## Summary

The use of invasive mechanical ventilation signifies active management of a severe, life-threatening exacerbation of asthma. It is a rare event among people admitted with asthma; only 250 people required invasive mechanical ventilation for asthma during 2002–03. People from non-English-speaking backgrounds who are admitted with asthma are more likely to require invasive mechanical ventilation than people from English-speaking backgrounds.