to ensure these drugs are used in an appropriate and safe manner and audit is a simple and effective means of achieving this.

**Conflict of interest declaration**

AP is the consultant of the Old Age Psychiatric team whose performance we audited.

**References**


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**Old age psychiatry and geriatric medicine admissions and elderly suicide rates in England**

Almost all elderly suicide victims have mental illness, and up to 90% have depression (Shah and De, 1998). A significant number of elderly suicide victims in Western countries consult their general practitioner or psychiatrist or contact mental health services between one week and six months prior to the suicide (Catell, 1988; Conwell et al., 1990; 1991; Catell and Jolley, 1995; Vassilas and Morgan, 1993; 1994). This offers an opportunity for identification and treatment of the mental illness. Thus, the availability of appropriate healthcare services may be an important factor associated with elderly suicide rates.

High suicide rates in China (both rural areas and Hong Kong), in part, have been attributed to lack of mental health services and poorly developed social welfare and benefit systems (Yip and Tan, 1998; Jianlin, 2000; Yip, 2001; Yip et al., 2000). Moreover, reduction in elderly suicide rates in Singapore and urban China have, in part, been attributed to improved healthcare and welfare services for the elderly (Kua et al., 2003; Yip et al., 2005). A decline in elderly suicide rates in England and Wales was associated with measures of improved healthcare for the elderly (Gunnell et al., 2003; Lodhi and Shah, 2005) including an increase in the number of general practitioners, hospital medical staff, outpatient appointments for mental illness, and field social workers and day center staff (Lodhi and Shah, 2005). However, in a cross-national study elderly suicide rates were higher in countries with greater numbers of psychiatric beds, psychiatrists and psychiatric nurses (Shah and Bhat, 2008). The relationship between elderly suicide rates and the utility of inpatient old age psychiatry (OAP) services has not been examined. Therefore, a study examining the relationship between elderly suicide rates and the utility of inpatient geriatric medicine (GM) and OAP services in England was undertaken with the null hypothesis that there will be no significant relationship between these variables. GM was considered because a third of GM inpatients have depression (Shah and Hoxey, 2000) and suicidal ideation (Shah et al., 2000).

Data on suicide rates in both sexes in the age-bands 65–74 years and 75+ years for England and Wales was ascertained from the World Health Organization (WHO) website (http://www.who.int/whosis/database/mort/table1.cfm) for each of the nine calendar years between 1998 and 2006. Data on the number of finished episodes (i.e. the number of patients discharged with a completed inpatient episode), median length of stay, and the number of bed days for patients admitted to GM services and OAP services in England was ascertained from nationally collected data (Hospital Episode Statistics, available at: www.hesonline.nhs.uk/Ease/servlet/ContentServer?siteID=1937&CATEGORYID=192). These national data are gathered centrally via the patient administration systems in nearly 400 hospitals in England. Data were ascertained for the
nine financial years (1 April to 31 March) between 1998/1999 and 2006/2007.

Data on the size of the elderly population in England and Wales was also ascertained from the WHO website (http://www.who.int/whosis/database/mort/table1.cfm) for each of the nine calendar years between 1998 and 2006. The rates of finished episodes and bed days for GM and OAP were calculated by dividing these two variables by the size of the elderly population (65+ years) for each of the nine years.

The relationship between suicide rates in both the elderly age-bands in both sexes and the rates of finished episodes, rates of bed days and median length of stay was examined with Spearman’s correlation coefficient ($\rho$).

There was a significant negative correlation between rates of GM finished episode and suicide rates in males aged 75+ years ($\rho = -0.68$, $P = 0.042$), but not with the other three suicide rate groups. There was no significant correlation between suicide rates in both sexes in both the elderly age-bands and rates of bed days and median length of stay in GM. There were significant positive correlations between rates of finished episodes in OAP and suicide rates in females aged 65–74 years ($\rho = +0.83$, $P = 0.006$) and 75+ years ($\rho = +0.77$, $P = 0.06$), but not with the two male groups. There were significant negative correlations between median length of stay in OAP and suicide rates in males aged 75+ years ($\rho = -0.67$, $P = 0.047$), females aged 65–74 years ($\rho = -0.77$, $P = 0.016$) and females aged 75+ years ($\rho = -0.78$, $P = 0.013$), but now with males aged 65–74 years. There was no significant correlation between rates of bed days in OAP and elderly suicide rates.

Some methodological issues need consideration. First, the accuracy of the nationally collected hospital episode statistics is unclear because the data is collected via the patient administration systems in nearly 400 hospitals (Shah, 2007). Data collected from such a large number of hospitals may be of variable quality. Second, there were only nine data points, and this small number may lead to type 1 or type 2 statistical errors (Shah, 2007). Third, in England and Wales, the coroner can only return a verdict of suicide if suicide can be proved beyond a reasonable doubt, and some genuine suicides may be misclassified as an open verdict when suicide cannot be proved beyond a reasonable doubt (O’Donnell and Farmer, 1995). This may have resulted in a lower genuine elderly suicide rate being included in the analysis, but data on deaths due to open verdicts were not available from the WHO for the period before 2001 when the ICD-9 classification was used. Fourth, it is also possible that other factors may independently influence elderly suicide rates and service characteristics leading to spurious correlations (epiphenomena).

The positive correlations between rates of finished episode in OAP and female suicide rates in both elderly age-bands were inconsistent with previous findings from the U.K. (Gunnell et al., 2003; Lodhi and Shah, 2004), Singapore (Kua et al., 2003) and urban China (Yip et al., 2005), where negative correlations between service provision and elderly suicide rates was observed. However, the findings were consistent with a cross-national study where a positive correlation was observed between elderly suicide rates and increased mental health service provision, including the density of psychiatric beds (Shah and Bhat, 2008). This may have several explanations. First, this may be an artifact of methodological issues discussed above. Second, evidence of higher suicide rates may have prompted policy makers, service commissioners and service providers to consider improvement in service provision. This is further supported by: (i) the positive correlation between suicide rates in older females and the percentage of the total health budget spent on mental health and per capita health expenditure in cross-national studies (Shah and Bhat, 2008; Shah et al., 2008); and (ii) in individual countries, like the U.K. (Shah and Coupe, 2009) and Korea (Chiu et al., 2003), policy-makers have implemented national suicide reduction policies. The mechanism for this could be as follows: (i) perception of high suicide rates; (ii) this perception leading to national policies to address mental health, including suicides; (iii) these policies resulting in increased expenditure on mental health services; and (iv) increased expenditure on mental health services resulting in increased provision of mental health services (Shah and Bhat, 2009). Third, other factors not examined in this study, including adequately resourced community mental health teams, social service teams and home treatment teams, may have simultaneously and independently influenced elderly suicide rates and provision of OAP services.

The negative correlations between elderly suicide rates and median length of stay in OAP units may also be an artifact of methodology. However, it is possible that suicidal patients require longer inpatient admissions and longer admissions may offer adequate opportunity to treat suicidal patients. This may, in turn, lead to a reduction in elderly suicide rates. The findings also suggest that different measures of utility of GM services have little impact on elderly suicide rates, which may be a genuine result or due to methodological issues. Patients presenting with suicidal ideation or depression without significant medical problems are more likely to be admitted to OAP units. Those presenting
with attempted suicide are more likely to be treated either in accident and emergency departments or on general medical wards before transfer to OAP units. Finally, a causal relationship between elderly suicide rates and provision of mental health services and its direction cannot be inferred from this cross-sectional ecological study.

**Conflict of interest**

None.

**References**


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**The relationship between elderly suicide rates and smoking in England and Wales**

Completed suicides have been shown to be associated with smoking cigarettes in cohort studies of mainly female registered nurses in the U.S.A. (Hemenway *et al.*, 1993), both sexes in the Finnish general population (Tanskanen *et al.*, 2000), male army recruits in the U.S.A. (Miller *et al.*, 2000a), males in the U.S. general population (Davey Smith *et al.*, 1992), army recruits in Sweden (Hemmingsson and Kriebel, 2003), males...