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Deliberate self-harm in rural and urban regions: A comparative study of prevalence and patient characteristics

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ABSTRACT

In countries like the UK, people living in urban regions are more likely to suffer poor physical and mental health than rural populations, and to have increased rates of psychiatric disorder. Urban/rural differences in suicidal behaviour have most frequently focussed on variations in the occurrence of suicide. We have investigated rates of deliberate self-harm (DSH) in urban and rural districts of Oxfordshire, England, and compared characteristics of DSH patients resident in these two areas. Information was collected on 6833 DSH episodes by 4054 persons aged 15 years and over presenting to the local general hospital between 2001 and 2005. We found that urban DSH rates were substantially higher than rural rates amongst both males and females aged between 15 and 64 years. This relationship was sustained even when socio-economic deprivation and social fragmentation were taken into account. There was little difference between urban and rural rates for patients aged 65 years and over. Urban DSH patients were more likely to be younger, non-white in ethnic origin, unemployed, living alone, to have a criminal record, to have previously engaged in DSH, and to report problems with housing. Rural DSH patients were more likely to suffer from physical illness, and to have higher suicide intent scores. Results of studies such as this can help identify where resources for preventive initiatives should be primarily directed and also what types of individuals may be at most risk in different areas. However, since variation by area will in part be due to differences at the individual level, further research utilising multi-level modelling techniques would be useful.

Introduction

Place of domicile is related to health. Studies of regional health differences in the UK, for example, appear to show that people living in urban areas are likely to experience poorer health than those living in rural districts. Urban dwellers are more likely to rate their health as only fair or poor (Riva, Curtis, Gauvin, & Fagg, 2009), and to experience higher rates of mortality and illness than urban populations (Barnett, Roderick, Martin, & Diamond, 2001; Hayes & Gale, 1999; Levin, 2003), although rates of illness have also been found to be high in remote rural regions (Barnett et al., 2001). Furthermore, common psychiatric disorders, in particular depression, are generally more prevalent amongst urban populations (Lehtinen et al, 2003; Lewis & Booth, 1994; Paykel, Abbott, Jenkins, Brugha, & Meltzer, 2000; Peen et al, 2007, 2010; Riva et al., 2009; Wang, 2004; Weich, Twigg, & Lewis; 2006).

Accounts of regional health differences often draw on two hypotheses about the possible relationship between health and environment: the 'drift' and 'breeder' hypotheses. The 'breeder hypothesis' proposes that exposure to environmental factors – physical, social, and behavioural – has a direct or indirect impact on an individual's health. Urban stressors that may have a particular impact on mental health include increased noise levels, higher crimes rates, pollution, and an uncared for built environment (Macintyre, Maciver, & Soomans, 1993), whereas rural populations may face different problems particular to their region, such as a lack of employment opportunities or affordable housing, inaccessible public and health services, or increased levels of social isolation. The 'drift hypothesis' proposes that persons with certain risk factors for ill-health are more inclined to live in particular types of area, either by moving to, from, or staying put in certain environments (Verheij, 1996).

Psychiatric disorder, especially depression is known to be an important risk factor for suicidal behaviour (Haw, Hawton, Houston, & Townsend, 2001; Suominen et al., 1996; Foster, Gillespie, & McClelland, 1997), which has also been shown to vary in prevalence in urban versus rural areas. Investigations into

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rural/urban differences in suicidal behaviour have most often focussed on regional variations in suicide rates. Rural suicide rates have been found to be higher than rates in urban areas in Australia (Caldwell, Jorm, & Dear, 2004; Dudley et al, 1998), Austria (Kapusta et al, 2008), Scotland (Levin & Leyland, 2005; Obafunwa & Busuttil, 1994), and China (Yip, Callanan, & Yuen, 2000). In England and Wales, suicide rates have been reported as highest in remote and rural areas, and inner-city locations (Kelly, Charlton, & Jenkins, 1995; Middleton, Sterne, & Gunnell, 2006), but when combined with 'undetermined' deaths they have been highest in urban areas (Saunderson, Haynes, & Langford, 1998). More recently, suicide rates amongst males in England were reported as being highest in rural areas after controlling for social deprivation (Gartner, Farewell, Dunstan, & Gordon, 2008).

Variation in rates of deliberate self-harm (DSH - any non-fatal intentional self-poisoning or self-injury) between rural and urban areas have been much less thoroughly investigated, but the few studies that have done so indicate that higher DSH rates occur in urban areas in Ireland (Corcoran, Arensman, & Perry, 2007), Finland (Ostamo et al, 1991), and Oxford, UK (Bancroft, Skrimshire, Reynolds, Simkin, & Smith, 1975), and in high density centres in rural districts and urban centres in the USA (Hemsptead, 2006). One possible explanation for the difference in spatial distribution of DSH and suicide rates may lie in the increased likelihood of access to lethal means such as firearms amongst rural populations (Dudley et al., 1998), with a consequent increase in the likelihood that a rural suicide attempt will result in a fatality. Thus rural DSH patients in Finland have previously been shown to use more seriously harmful methods of DSH (Niskanen, Koskinen, Lepola, & Venalainen, 1975). Greater difficulty in accessing emergency medical services from remote and rural areas may have an effect on the likelihood of fatality. There is also the possibility that environmental stressors of living in urban and rural areas may be different (Hayes & Gale, 2000). Isolation and social fragmentation, for example, which are likely to be greater in rural areas, appear to be more strongly associated with suicide than DSH in some studies (Hemsptead, 2006; Whitley, Gunnell, Dorling, & Davey-Smith, 1999).

In this study, we have investigated rates of DSH in urban and rural districts of Oxfordshire, England. As rates of DSH are known to be associated with levels of socio-economic deprivation and social fragmentation (Ayton, Rasool, & Cottrell, 2003; Gunnell, Peters, Kammerling, & Brooks, 1995; Gunnell, Shepherd, & Evans, 2000; Hawton, Harriss, Hodder, Simkin, & Gunnell, 2001), both of which are likely to vary in urban and rural locations, we have included measures of deprivation and social fragmentation. In the one previous study of which we are currently aware that has done this a small but significant residual relationship between area type and DSH rates was found after taking into account both deprivation and social fragmentation (Corcoran et al., 2007).

So far, little has been reported on differences in characteristics of DSH patients from rural and urban areas; rural DSH patients have been shown to be more likely to use more seriously harmful methods of DSH, to repeat DSH, and to be female in studies from Finland (Niskanen et al., 1975), India, (Kumar, Mohan, Gopinath, & Chandrasekaran, 2006), and Ireland (Lyster & Youssef, 1995). We have also investigated whether there are any differences in demographic and clinical characteristics of individual DSH patients who live in urban and rural areas.

Method

This study was conducted in Oxford and the surrounding area. While the catchment area does not include the extremes of urban and rural locations found in some areas of the UK, it is a reasonably representative location in terms of these two types of geographical area.

Study population

Patients were identified through the Oxford Monitoring System for Attempted Suicide (Hawton et al. 2003). All individuals who present to the John Radcliffe hospital (the local general hospital) following an episode of deliberate self-harm are identified either through assessment by members of the hospital psychiatric service, or, for non-assessed patients, by scrutiny of records of presentations to the Accident and Emergency Department. It has been established that this system produces comprehensive data (Sellar, Goldacre, & Hawton, 1990), and that the findings are broadly comparable with those from other areas in the United Kingdom (e.g., Platt, Hawton, Kreitman, Fagg, & Foster, 1988; Hawton et al., 2007).

DSH is defined as intentional self-injury or self-poisoning, irrespective of motivation (Hawton et al. 2003). Self-poisoning is defined as the intentional self-administration of more than the prescribed dose of any drug, and includes poisoning with non-ingestible substances, overdoses of 'recreational drugs', and severe alcohol intoxication where clinical staff consider such cases to be acts of deliberate self-harm. Self-injury is defined as any injury that has been deliberately self-inflicted.

Patient characteristics

For all patients treated for DSH in the general hospital and assessed by the general hospital psychiatric service, a clinician completes a standardised form that records demographic and clinical information, including: age, marital status, employment status, current and previous psychiatric treatment, method of DSH, previous DSH (irrespective of whether or not this resulted in a general hospital referral), alcohol misuse (defined as chronic alcoholism with physical symptoms, alcohol dependence, or excessive drinking), living situation, violence to others, violence received, criminal record, and a range of problems. A problem is defined as a factor that is causing current distress for the patient and/or contributed to the act of DSH. The Suicide Intent Scale (SIS) devised by Beck, Schuyler, and Herman (1974) is in most cases completed at the time of assessment.

Catchment area

The catchment area was defined according to the likelihood of a DSH patient attending the local general hospital in Oxford rather than any other hospital in the area. Oxfordshire Primary Care Trust provided information on hospital admission rates for ICD-10 codes X60 to X84 (encompassing all types of deliberate self-poisoning and self-injury) of persons aged 15 + years who were living in the electoral wards in Oxfordshire at the time of admission. Wards from which at least 90% of hospital admissions were to the local general hospital were included in the study catchment area. Where more than 10% of admissions from a ward were to other hospitals in the surrounding area, the ward was not included in the study catchment area. Whilst hospital admission rates were used to establish the catchment area, both admitted and non-admitted DSH patients were included in the study sample. There is no evidence to suggest that differential referral to alternative hospitals in the region occurs according to severity of DSH, i.e., if an individual lives in the catchment area of a hospital and carries out a self-harm act severe enough to require hospital presentation, they are likely to go to their local hospital.

The catchment area comprised 87 electoral wards that included the city of Oxford and its surrounding area. The average population