

**Impact of the recent recession on self-harm: longitudinal ecological and
patient-level investigation from the Multicentre Study of Self-harm in
England**

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ABSTRACT

Background

Economic recessions are associated with increases in suicide rates but there is little information for non-fatal self-harm.

Aims

To investigate the impact of the recent recession on rates of self-harm in England and problems faced by patients who self-harm.

Method

Analysis of data from the Multicentre study of Self-harm in England for 2001-2010 and local employment statistics for Oxford, Manchester and Derby, including interrupted time series analyses to estimate the effect of the recession on rates of self-harm.

Results

Rates of self-harm increased in both genders in Derby and in males in Manchester in 2008-2010, but not in either gender in Oxford, results which largely followed changes in general population unemployment. More patients who self-harm were unemployed in 2008-10 compared to before the recession. The proportion in receipt of sickness or disability allowances decreased. More patients of both genders had employment and financial problems in 2008-2010 and more females also had housing problems, changes which were also largely found in employed patients.

Limitations

We have assumed that the recession began in 2008 and information on problems was only available for patients having a psychosocial assessment.

Conclusions

Increased rates of self-harm were found in areas where there were greater rises in rates of unemployment. Work, financial and housing problems increased in people who self-harmed. Changes in welfare benefits may have contributed.

Declaration of interest

None

INTRODUCTION

Suicide rates tend to increase during economic recessions, in association with rising unemployment (e.g. (Chang et al., 2009; Chang et al., 2013; Stuckler et al., 2009, 2011; Swinscow, 1951)). There are a variety of explanations including loss of income, outstanding debt, mortgage payment problems and evictions, alcohol misuse, relationship breakdown and exacerbation of pre-existing mental disorders (Haw et al., 2015) . Historically men have been particularly vulnerable (Chang et al., 2009; Swinscow, 1951), although increasing workforce participation by women may increase their susceptibility to labour market shocks.

The most significant economic recession of the past 80 years began in 2008 with major global impacts. The UK has been one of the countries particularly affected. Suicide rates in England rose following the onset of the recession in 2008. There was a strong association between rates of suicide and unemployment in males, and areas experiencing greater increases in unemployment had larger increases in suicides (Barr et al., 2012). Changes in suicide rates varied by age groups in males in England and personal debt and house repossessions may have contributed to increases in suicide in younger men (Coope et al., 2014).

Less attention has been paid to possible effects of the recent economic recession on non-fatal self-harm, although it is well recognised that there is a strong association between unemployment and self-harm (Hawton and Fagg, 1988; Hawton and Rose, 1986; Platt and Hawton, 2000). Given the association between self-harm and suicide, (Bergen et al., 2011; Owens et al., 2002) and between socio-economic deprivation and self-harm (Gunnell et al., 1995; Hawton et al., 2001), an effect of recession on self-harm would be expected. There is some evidence of an increase in suicide attempts/self-harm following the recent recession in Ireland (Corcoran et al., 2015), Greece (Economou, 2013) and Spain (Cordoba-Dona et al., 2014). In a study in Italy there was a rise in suicide attempts thought to be related to financial circumstances due to the recent recession, although the numbers involved were relatively small. (De Vogli et al., 2013)

Studying non-fatal self-harm and economic recession can enable fuller examination of the factors that might precipitate the behaviour than is possible for suicide because of the opportunity to interview people following their self-harm acts. Thus one can, for example, examine potential contributory factors that may be related to economic downturn (e.g. work, financial, and housing problems) which could help highlight potential targets for intervention and prevention.

We have used data from the Multicentre Study of Self-harm in England (Bergen et al., 2010; Hawton et al., 2007) to investigate whether the recent economic recession had an impact on rates of self-harm, and, if so, which gender and age groups were most affected, how any effects were related to local changes in rates of unemployment, and also to the nature of the patients' characteristics and problems (work, finances, housing) which might explain any associations found.

METHOD

Study period

The study period was 2000 to 2010. We defined the end of 2007/ beginning of 2008 as the onset of the recession, in keeping with other authors.(Barr et al., 2012; Chang et al., 2013; Coope et al., 2014; Stuckler and Basu, 2013). Thus the study period included three years (2008-10) following the onset of the recession.

Self-harm

The data on self-harm were obtained through the Multicentre Study of Self-harm in England, through which information is collected on all self-harm presentations to major general hospitals in Oxford, Manchester and Derby (Bergen et al., 2010; Hawton et al., 2007). Non-fatal self-harm was defined as intentional self-poisoning or self-injury, irrespective of type of motivation or degree of suicidal intent (Hawton et al., 2003). Following self-harm the majority of patients received a psychosocial assessment by specialist psychiatric clinicians (and some by emergency department staff). Demographic, clinical and hospital management data on each episode (including referral for aftercare) were collected by clinicians using standardised forms or electronic data entry. Patients not receiving an assessment were identified through scrutiny of emergency department and medical records, from which more limited data (including socio-demographic information and methods of self-harm) were extracted by research clerks or, in one centre, by clinicians.

Local rates of unemployment

Annual rates of unemployment for persons aged 16-64 years between 2004 and 2010 in the areas where the study was based were obtained from the Office for National Statistics official labour market statistics website (Office for National Statistics, 2013). Local employment data for earlier years were unavailable.

Rates of self-harm

Numbers and rates of SH were calculated on a quarterly basis for persons aged 15-64 years for the three catchment areas, including by gender and age groups for the three centres combined (15-24 years, 25-34 years, 35-54 years and 55-64 years). Rates were based on individuals presenting from defined catchment areas in Manchester City, Derby Unitary area, and Oxford City and Oxfordshire wards where it is known that more than 90% of people presenting to emergency departments for adverse effects of drugs (including intentional non-fatal poisoning) go to the main general hospital where data collection for this study is based (Hawton et al., 2001). We used the period 2001 to 2010 for calculating rates of self-harm to ensure a consistent set of population figures for local Census Area Statistics areas from the 2001 Census. We have examined changes in numbers of persons and person-rates within quarter-year periods, irrespective of whether individuals had also self-harmed in other quarters.

Characteristics of patients

Patients who self-harmed during 2008-210 were compared by gender to those who self-harmed during 2005-2007 on employment (employed, unemployed, and sick/disabled), and problems precipitating the self-harm act (e.g. work-related, housing or finance). We restricted these analyses to these two time periods in order to focus on changes likely to be related to the depression. For these analyses we only included patients who received a psychosocial assessment while in the general hospital (as information on employment status and problems was not available for non-assessed patients) and just used the first assessed episode for each person in each year. These analyses included all assessed patients who self-harmed from the multicentre study database, not just those from the catchment areas used to calculate local rates. Unemployment was defined as per the official definition in England, namely without work and seeking employment. A problem was defined as any current difficulty reported by

a patient or identified by a clinician as being related to self-harm. Analyses of problems related to unemployment were restricted to people of working age (15 to 64 years). In Oxford and Derby all identified problems are recorded, whereas in Manchester usually only the main problems are recorded. In this study we focussed on problems relating to employment, housing and finances.

Statistical analyses

Trends in rates of self-harm before and after the onset of the recession were compared through Interrupted Time Series analysis (Wagner et al., 2002). This method controls for baseline level and trend when estimating expected changes in rates of self-harm due to the intervention (the start of the recession). Specifically, segmented regression analysis was used to estimate the mean quarterly rate of self-harm after the start of the recession compared with the projected (expected) mean quarterly rate of self-harm based on the trend during the pre-recession period. The latter were obtained from best fitted data lines from the regressions, and are better estimates than taking average values. The start of 2008 was chosen as the point of intervention. Our data comprised 28 quarters in the pre-intervention segment and 12 quarters in the post-intervention segment. Regression coefficients for both level and trend were used to estimate the average quarterly absolute differences (using the midpoint of the post-intervention period).

Proportions of patients who self-harmed before and after the onset of the recession were compared on employment status and type of problems (work-related, financial and housing) using the chi-square test. For these analyses we used combined data for the three centres on the basis that these provide a more representative picture of the impact of the recession than if single centres were used.

All analyses were conducted for the two genders separately. The statistical package used was Stata 11.

Ethical approval

The monitoring systems in Oxford and Derby have approval from local Health/Psychiatric Research Ethics Committees to collect data on SH for local and multicentre projects. Self-harm monitoring in Manchester is part of a clinical audit system, and has been ratified by the local Research Ethics Committee. All three monitoring systems are fully compliant with the Data Protection Act of 1998. All centres have approval under Section 251 of the National Health Service Act 2006 to collect patient identifiable information without patient consent. All patients had access to an information leaflet about the data collection.

RESULTS

Trends in local rates of unemployment and self-harm

Trends in annual local unemployment figures for 2004-2010 for males and females in the three centres based on ONS employment statistics (Figures 1a and 1b) show that more of the general population of both genders were unemployed across the study period in Manchester than in Derby and that more people in Derby were unemployed than in Oxford. The Figures also show that increases in unemployment following the onset of the recession (end of 2007/beginning of 2008) were marked in both genders in Manchester and Derby, with little change in males in Oxford (figures unavailable for females in Oxford in 2010).

(Figures 1a and b about here)

The total numbers of patients who self-harmed aged 15-64 years in the catchment areas used to calculate rates of self-harm between 2001 and 2010 were: Oxford, N = 10,072 (3941

males, 6131 females); Manchester, N = 16739 (6877 males, 9862 females); Derby, N = 9140 (3576 males, 5564 females).

Interrupted time series analyses based on quarterly rates, using the end of 2007/ beginning of 2008 as the cut-off point for the beginning of the recession (Table 1; Figures 2 a, b and c), showed that there were significant increases in rates of self-harm in 2008-10 compared with those expected on the basis of pre-recession trends, in both genders in Derby, and in males in Manchester. Relatively little change was seen in relation to the onset of the recession in either males or females in Oxford or in females in Manchester (data not shown).

(Table 1 and Figure 2a,b and c about here)

The estimated increase in rates of self-harm during 2008-2010 in males in Derby was 22%, or 167 individuals, and in females was 30%, or 708 individuals. The increase in rates of self-harm in males in Manchester was 22%, equivalent to 368 individuals.

The increases in rates of self-harm in both males and females in Derby were seen in 15-24 year-olds and 35-54 year-olds, and in females in all age groups except 55-64 year-olds. The increase in rates of self-harm in males in Manchester was seen in all age groups (data not shown).

Changes in employment categories in self-harm patients

The total numbers of self-harm patients aged 15-64 years in the catchment areas who received a psychosocial assessment and on whom information on employment status and problems (see below) was available between 2000 and 2010 in the three centres were:

Oxford, N = 7567 (3145 males, 4422 females); Manchester, N = 9941 (4437 males, 5504 females); Derby, N = 7105 (3128 males, 3970 females).

The trends in employment status of male and female who self-harmed between 2000 and 2010 are shown in Figures 3a, b and c. In order to examine the changes around the time of the onset of the recession more closely we compared the proportions of individuals who self-harmed according to specific employment categories in the three years before the recession (2005-2007) with the proportions in the subsequent three years (2008-2010). There were no significant overall decreases in the proportion of patients who were employed following the onset of the recession, but increases in both genders in those who were unemployed and marked decreases in those who were registered sick or disabled (see Table 2). These changes occurred in Derby and Manchester, but not in Oxford (data not shown).

(Table 2 about here)

(Figure 3 a and b about here)

Self-harm patients' problems with employment, finances and housing

Based on data from all three centres combined there were marked increases in 2008-2010 compared to 2005-2007 in the proportions of assessed patients of both genders who were identified as having problems at the time of self-harm that were related to employment and, finances and, in females only, housing (see Table 3 and Figure 4a and b).

(Table 3 about here)

(Figure 4a and b about here)

Even in those individuals who were employed at the time of self-harm there was an increase in the proportions of males with problems related to employment and in the proportions of

females with employment, financial and housing problems in 2008-2010 compared with 2005-2007 (Table 3).

Discussion

In this study we have used time-series data from three cities in England to examine the possible impact of the recent recession on self-harm, including both trends in rates of self-harm and changes in the characteristics of self-harm patients in terms of their employment status and the nature of their problems. Thus we have been able to examine evidence for the potential impact of the recession at both ecological and individual patient levels.

Rates of self-harm increased during the three years following the onset of the recession but this was not a uniform pattern geographically. Rates rose significantly in both genders in Derby and in males in Manchester, whereas there was no major change in rates in either gender in Oxford. There were higher rates of unemployment in Manchester and Derby than Oxford throughout the study period and following the onset of the recession there were substantial increases in local unemployment rates in both Manchester and Derby but not in Oxford. Thus impact of the recession on joblessness at the local level appears to have been reflected in rates of self-harm. This is similar to the apparent impact of the recent recession on suicides in England (Barr et al., 2012). It is unclear why there was no apparent impact of increased unemployment levels on rates of self-harm in females in Manchester during the study period (although rates have subsequently increased; see <http://cebmh.warne.ox.ac.uk/csr/mcm/>).

In order to investigate *how* the recent recession might have influenced self-harm we have been able to examine individual patient data. That unemployment is a reason for the increase

in rates of self-harm following the onset of the recession is supported by the fact that the proportion of the population who self-harmed and who were unemployed increased after the beginning of 2008 and that self-harm was more frequently seen as related to unemployment. This crucial piece of information has been lacking in most previous studies of changes in suicide rates associated with recessions, which have largely focussed on ecological associations between rates of unemployment and suicide rates (Barr et al., 2012; Chang et al., 2009; Chang et al., 2013). While overall unemployment rates rose following the onset of the recession, the size of the increase was less than in previous recessions, which is perhaps attributable to more flexible working, 'zero hours contracts' and other changes (Bell and Blanchflower, 2011; Hijzen and Venn, 2011).

Importantly, we have also shown that following the onset of the recession there was a decrease in the proportions of self-harm patients of both genders across the three centres who were registered as sick or disabled. This could have been the result of the introduction in Britain of more stringent criteria for registering as sick or disabled through the introduction of the new Work Capability Assessment and Employment Support Allowance in October 2008 and further measures which followed (although we did not know the benefit status of individuals in this study). Other authors have expressed concerns that strategies which governments use to try and tackle the impact of recessions may have important health consequences (Hawton and Haw, 2013; Stuckler and Basu, 2013).

We have also shown that more self-harm patients presenting to hospital following the onset of the recent recession had problems relating to work, finance and housing (females only) than in the years before it began. Even in those who were employed at the time of self-harm there was an increase in problems related to employment in males, and in problems related to

employment, finances and housing in females. These findings not only strengthen the conclusion that the recent recession has had an impact on self-harm but also point to factors that may have contributed to this effect and suggest that the impact occurred among the employed as well as those who lost their jobs. Other factors may also contribute to the increased risk of self-harm, including the impact of consequences of recession on family relationships, mental health, substance misuse, social and financial support, and health and community services (Haw et al., 2015; Stuckler and Basu, 2013).

Our findings, and those of other studies of the impact of recessions on suicidal behaviour, have implications for policy makers, clinicians and researchers. It is important that policy makers recognise that maintenance of social welfare and work programmes at times of recession are likely to be important in reducing the impact of the consequences of recessions (Stuckler and Basu, 2013; Stuckler et al., 2009). Reducing access to sickness/disablement benefits may add to a negative impact.

Clinicians, especially those working in primary care and in self-harm services, should try to identify individuals and families at risk due to the local effects of economic downturn.

Clinical assessment should include careful inquiry about actual or threatened change of employment status and of disability or sickness allowances, and the likely consequences.

Provision of advice on welfare benefits may help improve the mental well-being of those who use it (Abbott and Hobby, 2000; Abbott et al., 2006). Researchers investigating the impacts of economic downturns on suicidal behaviour need to look beyond just associations between unemployment and rates of the behaviour. Our results suggest that it is important to take account of other possible impacts, including, for example, the problems people face (and not just those who become unemployed) and changes in welfare and other benefits.

Limitations

Like other authors (Barr et al., 2012; Chang et al., 2013; Stuckler and Basu, 2013) we have used the beginning of 2008 as the onset of the recent recession. The official onset of the recession was actually the second quarter-year of 2008; however, as in the USA (Stuckler and Basu, 2013), there were indications (house repossessions, bankruptcies) in England that the economic downturn began well before that (Coope et al., 2014). While the onset of a major economic downturn such as this may be gradual, because our analysis focuses on the impact of economic changes which became far more widespread after the beginning of 2008 we have used the beginning of 2008 as the discontinuity point.

Use of information from three centres has allowed us to examine possible impacts of the recession on rates of self-harm and to relate these to levels and changes in local rates of unemployment and other employment categories. However, we cannot assume that these findings will apply across the whole of the UK. Nevertheless, our findings regarding changes in rates of self-harm are in keeping with those found for suicide nationally using much larger geographical areas (Barr et al., 2012). We have only focussed on the first three years since the onset of the recession. Clearly, potential longer-term effects should be investigated. In the very young, concerns have been raised that there may be very long-term psychological consequences of unemployment (Hawton and Haw, 2013; Nordström Skans, 2004).

Our results concerning characteristics of patients at the individual level are restricted to patients who received a psychosocial assessment while in hospital. During the period for which we examined patient characteristics (2005-2010) the proportion of episodes in which patients were assessed across the three centres was 52%. Another potential limitation is

whether there could have been ascertainment bias in the sense that awareness of the recession might have influenced clinician identification and recording of problems. Also, it is possible that economic factors might have influenced help seeking (i.e. attendance at hospital following self-harm). We believe that these possibilities are unlikely but cannot disprove them.

Conclusions

We have shown that the recession has been associated with an increase in rates of self-harm. However, this was not a uniform effect, appearing to be related to local levels of, and changes in, unemployment. They may also have been linked to reduced access to sickness and disablement benefits. The effect was reflected in increases in proportions of patients with problems likely to be related to the impact of the recession, including those concerning work, finances and housing. These apparent impacts were found in employed as well as unemployed patients. The findings have implications for clinicians assessing individuals at risk and following self-harm, and for broader prevention initiatives.

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References

- Abbott, S., Hobby, L., 2000. Welfare benefits advice in primary care: Evidence of improvements in health. *Public Health* 114, 324-327.
- Abbott, S., Hobby, L., Cotter, S., 2006. What is the impact on individual health of services in general practice settings which offer welfare benefits advice? *Health Social Care Community* 14, 1-8.
- Barr, B., Taylor-Robinson, D., Scott-Samuel, A., McKee, M., Stuckler, D., 2012. Suicides associated with the 2008-10 economic recession in England: Time trend analysis. *BMJ* (Online) 345.
- Bell, D.N.F., Blanchflower, D.G., 2011. Young people and the Great Recession. *Oxford Rev Econ Pol* 27, 241-267.
- Bergen, H., Hawton, K., Kapur, N., Cooper, J., Steeg, S., Ness, J., Waters, K., 2011. Shared characteristics of suicides and other unnatural deaths following non-fatal self-harm? A multicentre study of risk factors. *Psychological Medicine* 42, 727-741.
- Bergen, H., Hawton, K., Waters, K., Cooper, J., Kapur, N., 2010. Epidemiology and trends in non-fatal self-harm in three centres in England, 2000 to 2007. *British Journal of Psychiatry* 197, 493-498.
- Chang, S.S., Gunnell, D., Sterne, J.A.C., Lu, T.H., Cheng, A.T.A., 2009. Was the economic crisis 1997-1998 responsible for rising suicide rates in East/Southeast Asia? A time-trend analysis for Japan, Hong Kong, South Korea, Taiwan, Singapore and Thailand. *Social Science and Medicine* 68, 1322-1331.
- Chang, S.S., Stuckler, D., Yip, P., Gunnell, D., 2013. Impact of 2008 global economic crisis on suicide: Time trend study in 54 countries. *BMJ* (Online) 347.
- Coope, C., Gunnell, D., Hollingworth, W., Hawton, K., Kapur, N., Fearn, V., Wells, C., Metcalfe, C., 2014. Suicide and the economic crisis: who is most at risk? Trends in suicide rates in England and Wales 2001-2011. *Social Science & Medicine*.

Corcoran, P., Griffin, E., Arensman, E., Fitzgerald, A.P., Perry, I.J., 2015. Impact of the economic recession and subsequent austerity on suicide and self-harm in Ireland: An interrupted time series analysis. *International journal of epidemiology* 44, 969-977.

Cordoba-Dona, J.A., San Sebastian, M., Escolar-Pujolar, A., Martinez-Faure, J.E., Gustafsson, P.E., 2014. Economic crisis and suicidal behaviour: the role of unemployment, sex and age in Andalusia, Southern Spain. *Int J Equity Health* 13.

De Vogli, R., Marmot, M., Stuckler, D., 2013. Excess suicides and attempted suicides in Italy attributable to the great recession. *Journal of Epidemiology and Community Health* 67, 378-379.

Economou, M., Madianos, M., Evangelia Peppou, L., Theleritis, C., Patelakis, A., Stefanis, C., 2013. Suicidal ideation and reported suicide attempts in Greece during the economic crisis. *World Psychiatry* 12, 53-59.

Gunnell, D., Peters, T., Kammerling, R., Brooks, J., 1995. Relation between parasuicide, suicide, psychiatric admissions, and socioeconomic deprivation. *British Medical Journal* 311, 226-230.

Haw, C., Hawton, K., Gunnell, D., Platt, S., 2015. Economic recession and suicidal behaviour: Possible mechanisms and ameliorating factors. *Int J Soc Psychiatry* 61, 73-81.

Hawton, K., Bergen, H., Casey, D., Simkin, S., Palmer, B., Cooper, J., Kapur, N., Horrocks, J., House, A., Lilley, R., Noble, R., Owens, D., 2007. Self-harm in England: a tale of three cities. Multicentre study of self-harm. *Social Psychiatry and Psychiatric Epidemiology* 42, 513-521.

Hawton, K., Fagg, J., 1988. Suicide, and other causes of death, following attempted suicide. *British Journal of Psychiatry* 152, 359-366.

Hawton, K., Harriss, L., Hall, S., Simkin, S., Bale, E., Bond, A., 2003. Deliberate self-harm in Oxford, 1990-2000: a time of change in patient characteristics. *Psychological Medicine* 33, 987-996.

Hawton, K., Harriss, L., Hodder, K., Simkin, S., Gunnell, D., 2001. The influence of the economic and social environment on deliberate self-harm and suicide: an ecological and person-based study. *Psychological Medicine* 31, 827-836.

Hawton, K., Haw, C., 2013. Economic recession and suicide: The association is clear but government response may limit its extent. *BMJ (Online)* 347.

Hawton, K., Rose, N., 1986. Attempted suicide and unemployment among men in Oxford. *Health Trends* 2, 29-32.

Hijzen, A., Venn, D., 2011. The Role of Short-Time Work Schemes during the 2008-09 Recession, OECD Social, Employment and Migration Working Papers. OECD Publishing, Paris.

Nordström Skans, O., 2004. Scarring effects of the first labour market experience: A sibling based analysis. , IDEAS.

Office for National Statistics, 2013. Nomis official labour market statistics.

Owens, D., Horrocks, J., House, A., 2002. Fatal and non-fatal repetition of self-harm. Systematic review. *British Journal of Psychiatry* 181, 193-199.

Platt, S., Hawton, K., 2000. Suicidal behaviour and the labour market, In: Hawton, K., Van Heeringen, K. (Eds.), *The International Handbook of Suicide and Attempted Suicide*. Wiley, Chichester, pp. 303-378.

Stuckler, D., Basu, S., 2013. *The Body Economic: Why Austerity Kills*. Allen Lane.

Stuckler, D., Basu, S., Suhrcke, M., Coutts, A., McKee, M., 2009. The public health effect of economic crises and alternative policy responses in Europe: an empirical analysis. *The Lancet* 374, 315-323.

Stuckler, D., Basu, S., Suhrcke, M., Coutts, A., McKee, M., 2011. Effects of the 2008 recession on health: A first look at European data. *The Lancet* 378, 124-125.

Swinscow, D., 1951. Some suicide statistics. *British Medical Journal* 1, 1417-1423.

Wagner, A.K., Soumerai, S.B., Zhang, F., Ross-Degnan, D., 2002. Segmented regression analysis of interrupted time series studies in medication use research. *Journal of Clinical Pharmacy and Therapeutics* 27, 299-309.

Table 1 Estimates of changes in rates of self-harm in 2008-2010 in the three centres relative to expected rates based on trends in 2001-2007, by gender

Estimation of the absolute change in rates during 2008 to 2010 compared to expected rates based on 2001 to 2007 trends			
	Mean quarterly estimated rate without recession †	Mean quarterly estimated rate with recession †	Mean quarterly change during January 2008 to December 2010 relative to the expected rate (95% CI)
Oxford			
males	51.9	58.1	6 (-2 to 14)
females	103.8	94.5	-9 (-26 to 8)
Manchester			
males	76.7	93.2	16 (3 to 30)*
females	136.1	134.1	-2 (-20 to 16)
Derby			
males	78.5	95.4	17 (1 to 33)*
females	115.9	151	35 (18 to 52)*

† rate of self-harm per 100,000

*P<0.05

Table 2 Changes in employment status of assessed self-harm patients during 2008 to 2010 compared with 2005 to 2007, for the three centres combined, by gender

Proportion of individuals				
	2005 to 2007	2008 to 2010	χ^2 (df=1)	P
	n/N (%)	n/N (%)		
Males				
Employed	1079/2898 (37.2)	997/2624 (38.0)	0.34	0.56
Unemployed	1175/2898 (40.6)	1203/2624 (45.9)	15.8	<0.001
Sick/disabled	544/2898 (18.8)	314/2624 (12.4)	42.9	<0.001
Females				
Employed	1611/3981 (40.5)	1401/3480 (40.3)	0.03	0.85
Unemployed	1289/3981 (32.4)	1235/3480 (35.5)	8.02	0.005
Sick/disabled	604/3981 (15.2)	382/3480 (11.0)	28.5	<0.001

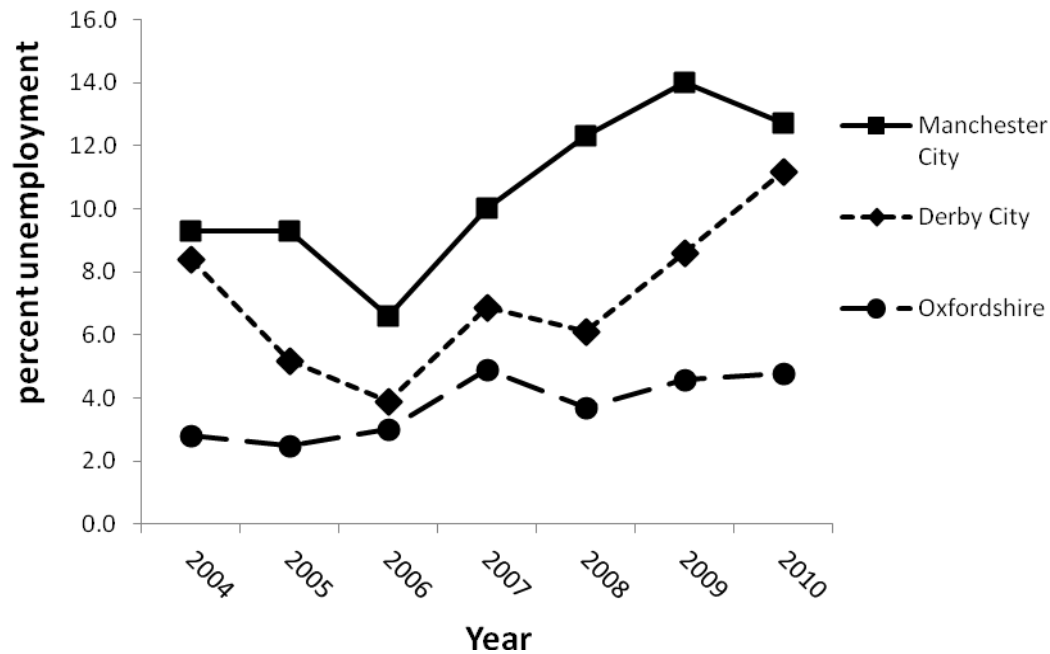
Table 3 Problems related to self-harm episodes during 2008 to 2010 compared with 2005 to 2007, for the three centres combined, by gender, for a) all assessed patients, and b) those who were employed at the time of self-harm

Proportion of individuals reporting problem				
	2005 to 2007	2008 to 2010	χ^2 (df=1)	P
	n/N (%)	n/N (%)		
a) All individuals				
Males				
Employment	535/2792 (19.2)	702/2549 (27.5)	52.5	<0.001
Finance	527/2790 (18.9)	558/2547 (21.9)	7.5	0.006
Housing	505/2792 (18.1)	487/2548 (19.1)	0.93	0.35
Females				
Employment	526/3860 (13.6)	635/3385 (18.8)	35.3	<0.001
Finance	552/3304 (14.3)	602/3385 (17.8)	16.2	<0.001
Housing	476/3862 (12.3)	489/3386 (14.4)	7.0	0.008
b) Employed individuals				
Males				
Employment	198/1049 (18.9)	266/971 (27.4)	20.7	<0.001
Finance	204/1046 (19.5)	199/971 (20.5)	0.31	0.62
Housing	109/1047 (10.4)	121/971 (12.5)	2.1	0.147
Females				

Employment	268/1567 (17.1)	311/1370 (22.7)	14.5	<0.001
Finance	232/1563 (14.8)	253/1369 (18.5)	7.0	0.009
Housing	139/1566 (8.9)	159/1369 (11.6)	6.0	0.017

Figure 1 Percentage of unemployed among economically active individuals aged 16-64 years in the local catchment area populations of the three centres, 2004-2012

a) males



b) females

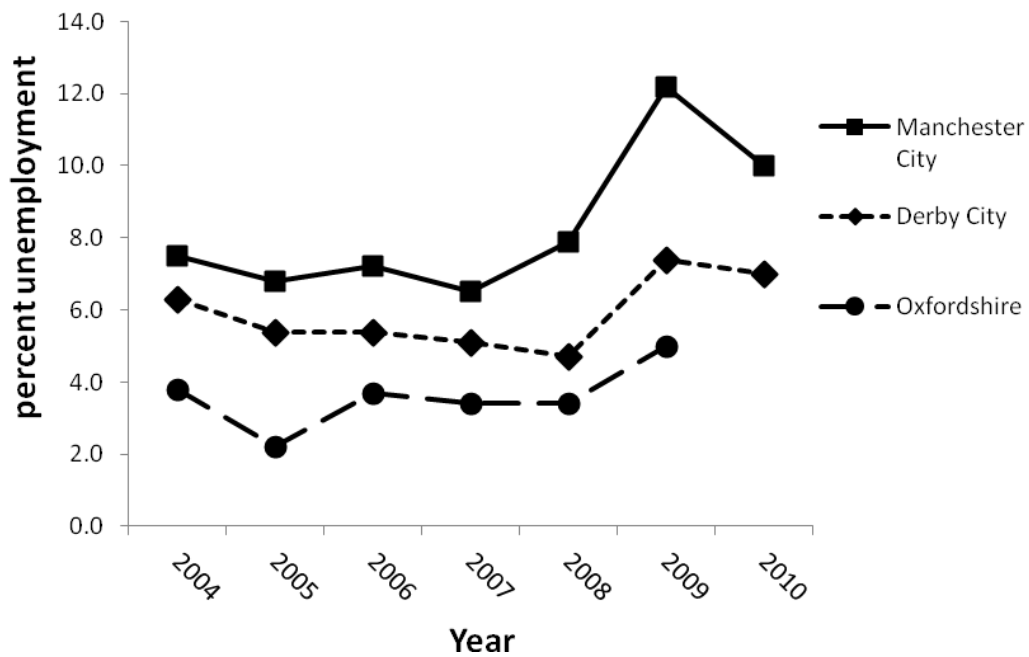
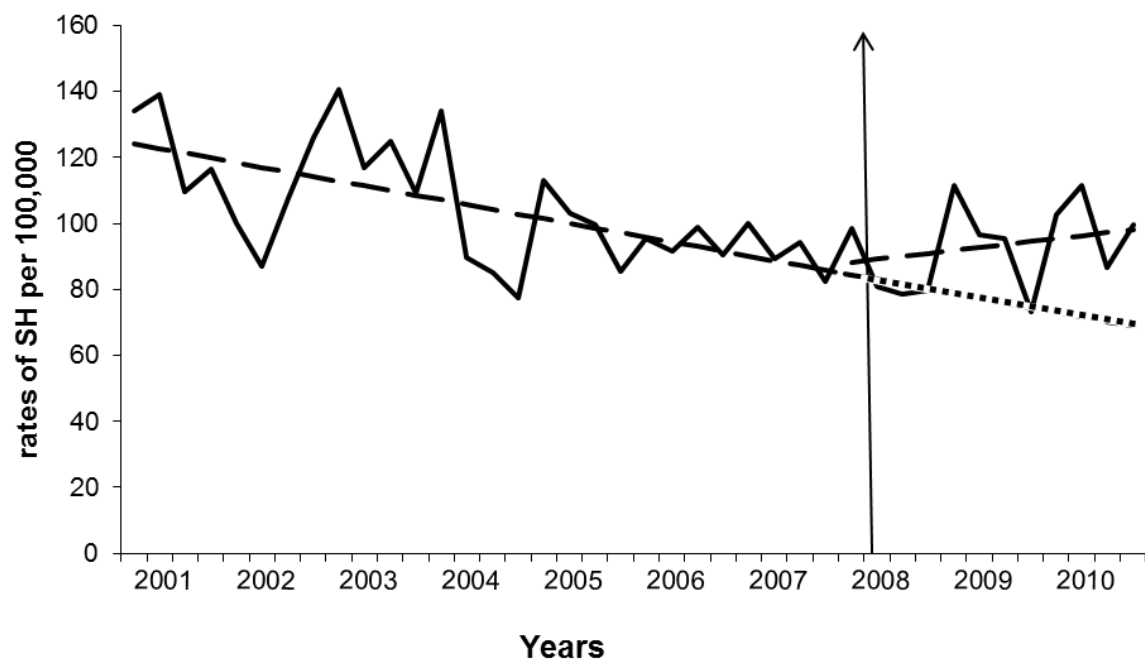


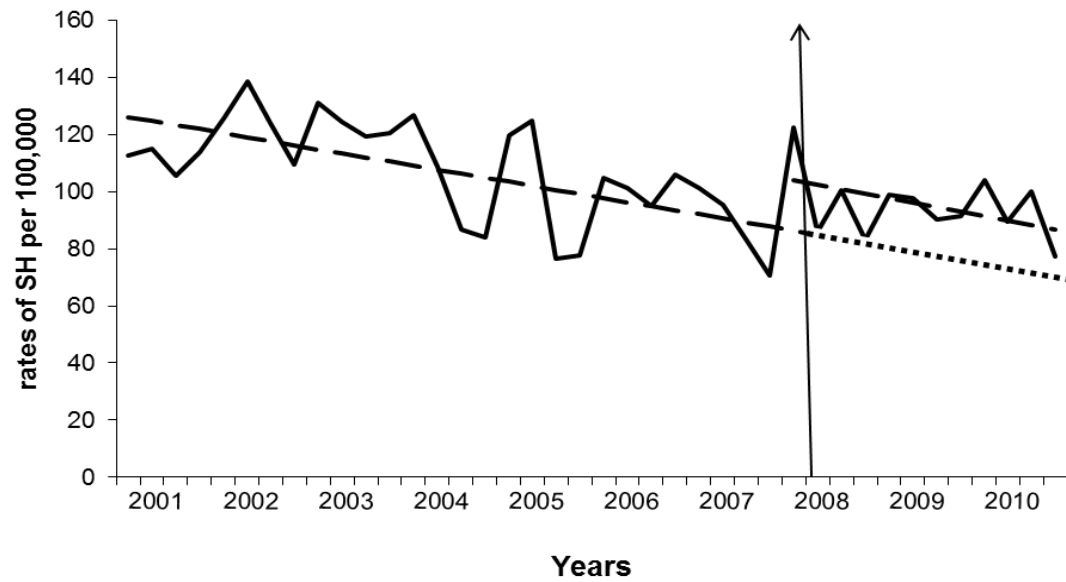
Figure 2 Observed rates of self-harm (SH) and best fit interrupted time series regression estimates before and after the economic recession (beginning of 2008) in males in Manchester and males and females in Derby

— Quarterly rate
 Regression line:
 — — Actual
 Projected based on pre-recession rates

a) Manchester males



b) Derby males



c) Derby females

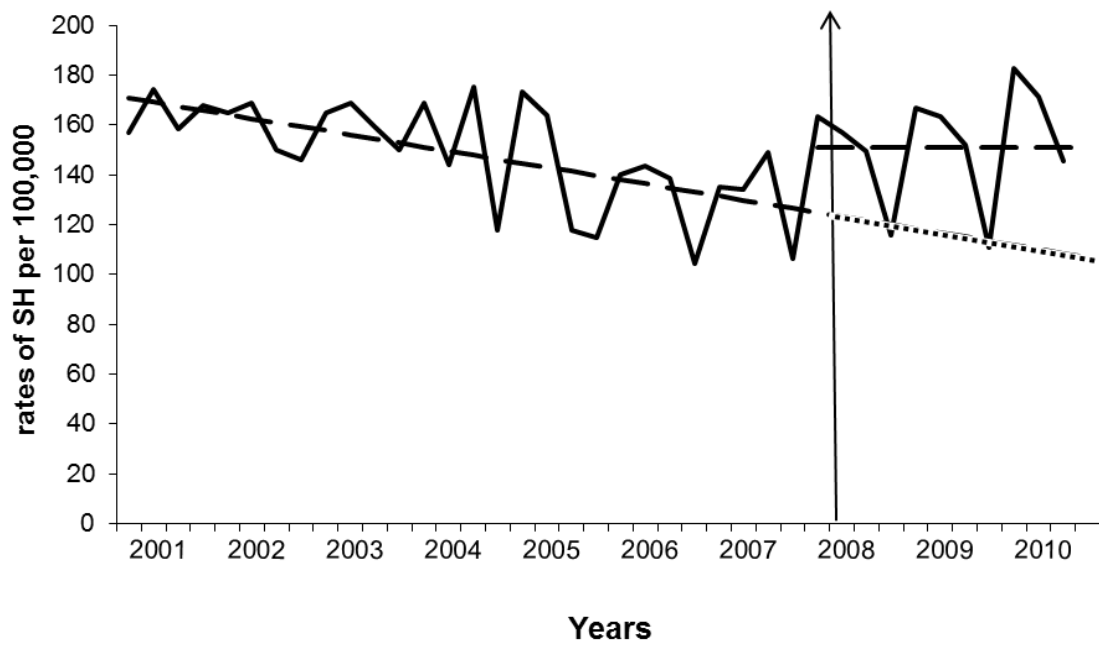
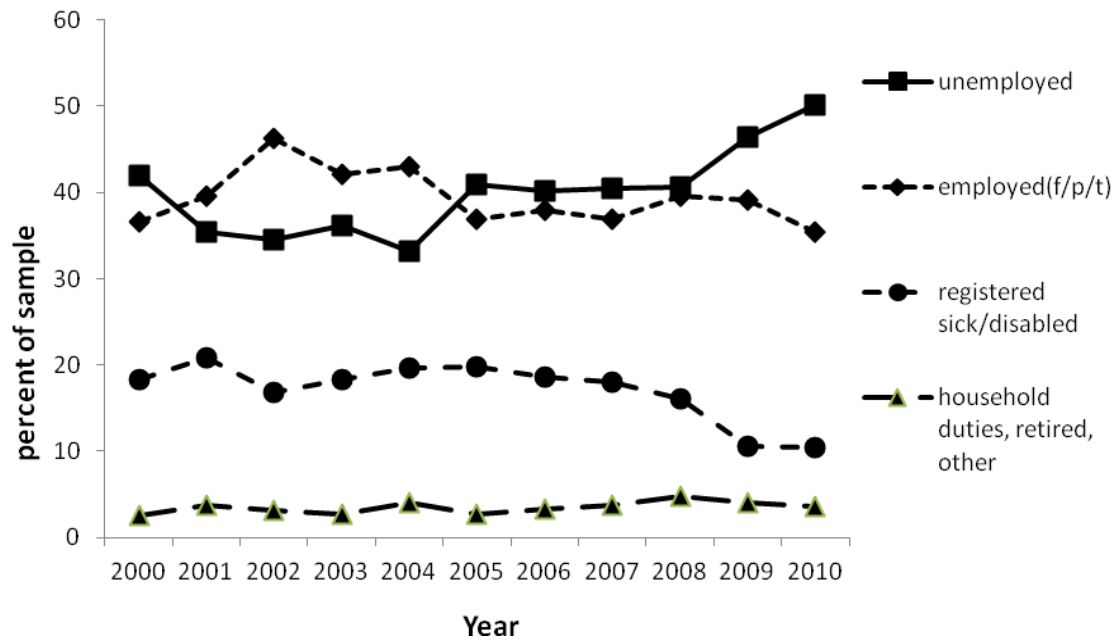


Figure 3 Employment status of individuals aged 15 to 64 years (excluding students) in all three centres at their first assessed episode in each year, 2000 to 2010

(a) males



(b) females

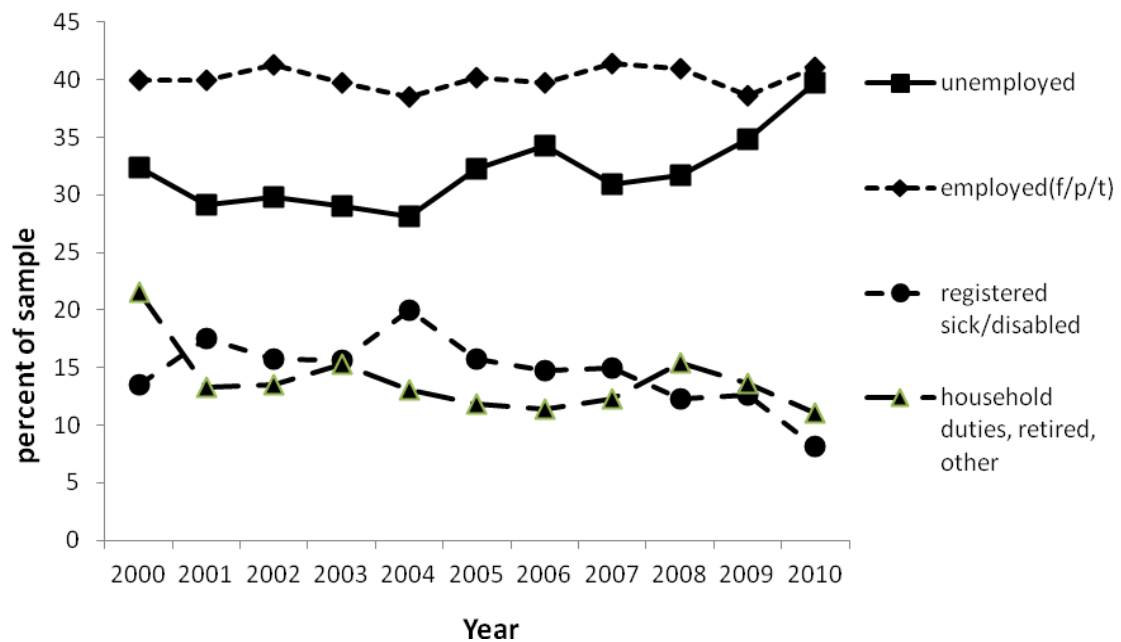
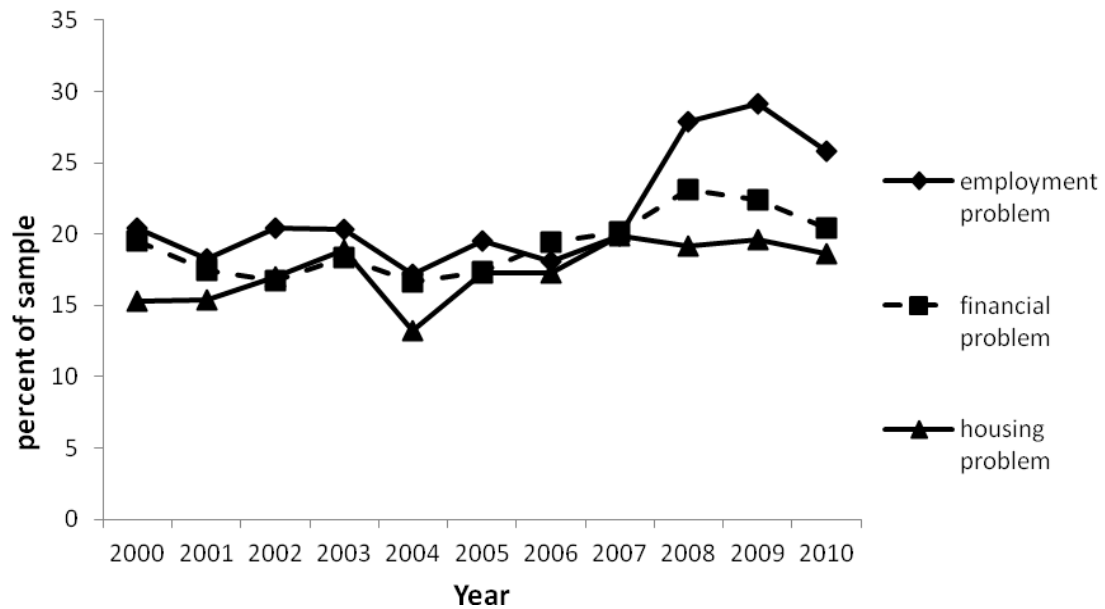


Figure 4 Problems identified in individuals aged 15 to 64 years (excluding students) in all three centres at their first assessed episode in each year, 2000 to 2010

a) males



b) females

