

Factors influencing the development and amelioration of suicidal thoughts in the general population

Cohort study

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Background The incidence of suicidal thoughts in the British population is unknown.

Aims To determine the factors associated with the development of, and recovery from, suicidal thoughts.

Method An 18-month follow-up survey investigated 2404 of the adults who took part in the second National Psychiatric Morbidity Survey.

Results The annual incidence of suicidal thoughts was 2.3%. Incidence was highest in women and among 16- to 24-year-olds. Increased incidence was associated with not being in a stable relationship, low levels of social support and being unemployed. Fifty-seven per cent of those with suicidal thoughts at baseline had recovered by the 18-month follow-up interview.

Conclusions Risk factors for suicidal thoughts are similar to those for completed suicide, although the age and gender patterning is different. Fewer than 1 in 200 people who experience suicidal thoughts go on to complete suicide. Further study into explanations for the differences in the epidemiology of suicidal thoughts and suicide is crucial to understanding the pathways (protective and precipitating) linking suicidal thoughts to completed suicide and should help inform effective prevention of suicide.

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Suicidal thoughts are a key stage in the pathway leading to suicide. A greater understanding of the social, psychological and treatment-related factors influencing their development and amelioration could inform suicide prevention strategies (Department of Health, 2002). Several cross-sectional studies have documented the prevalence of and risk factors for suicidal thoughts (Paykel *et al*, 1974; Hintikka *et al*, 1998; Weissman *et al*, 1999; Goldney *et al*, 2000; Kjoller & Helweg-Larsen, 2000; Thomas *et al*, 2002). As these studies measure risk factors and disease status contemporaneously, it is possible that concurrent psychiatric disorder might distort an individual's reporting of factors such as social support and life events, leading to biased estimates of their association. Likewise, possible risk factors such as unemployment, reduction in income and relationship breakdown might result from, rather than cause, psychiatric disorder leading to suicidal thoughts (reverse causation). Only one small questionnaire-based study in Finland (Hintikka *et al*, 2001) and a study of American female twins (Fanous *et al*, 2004) have prospectively investigated the incidence of suicidal thoughts and factors associated with recovery from such thoughts. Here we report the findings from an 18-month follow-up of a sample of men and women who took part in the second National Survey of Psychiatric Morbidity of adults living in private households in Great Britain (Meltzer *et al*, 2002; Singleton & Lewis, 2003). Our aim was to investigate factors associated with the new occurrence of, and recovery from, suicidal thoughts.

METHOD

Between March and September 2000, a sample of 8580 adults aged 16–74 years (66% of the sample) were interviewed in the second National Survey of Psychiatric Morbidity of adults living in private

households in Great Britain (Singleton *et al*, 2001). All participants had levels of psychiatric disorder assessed using the Clinical Interview Schedule – Revised (CIS–R; Lewis & Pelosi, 1990; Lewis *et al*, 1992); scores of 12 or more on this scale indicate the presence of mental illness. The study sample was randomly drawn from all people living in private households in Great Britain, stratified by Britain's ten National Health Service regions and socio-economic conditions in each area; the primary sampling units were postcode sectors. Eighteen months later 3561 of the original respondents (all of those with CIS–R scores greater than 5 and a 20% random sample of those with scores of 5 or less) were approached for repeat interviews: 2413 (67.8%) were interviewed, 624 (17.5%) could not be traced or contacted and 508 (14.3%) refused to be interviewed. 'Non-responders' were more likely to be young, single and of lower socio-economic position and had slightly higher rates of disorder. Full data on suicidal thoughts were available for 2404 respondents and these people form the basis of this analysis.

Definitions

Suicidal thoughts were defined as a positive response to the question, 'Have you thought of taking your life, even if you would not really do it?' This question was drawn from one used in a study of suicidal thoughts in the USA (Paykel *et al*, 1974). Two other suicide-related questions about 'life-weariness' were asked in the National Survey of Psychiatric Morbidity ('Have you felt that life was not worth living?' and 'Have you wished that you were dead?'), and other researchers (Goldney *et al*, 2000; Watson *et al*, 2001) and a previous analysis of this data-set (Gunnell & Harbord, 2003) have used positive responses to such questions in broader definitions of suicidal thoughts (Goldney *et al*, 2000; Watson *et al*, 2001; Meltzer *et al*, 2002). This analysis, however, is based on the more restricted definition.

In the baseline survey people were asked whether they had experienced suicidal thoughts in the past week, the past year or at some other point in their lives. At the 18-month follow-up they were also asked if they had experienced suicidal thoughts in the past week, the past year or since the last interview.

We undertook two separate analyses, first to assess factors associated with the

new occurrence of suicidal thoughts in people without suicidal thoughts in the year before the baseline interview; and second, to assess factors associated with recovery in people with suicidal thoughts in the year before the baseline survey. We defined recovery as the absence of suicidal thoughts since the baseline interview, as reported at follow-up. We assessed the effect of the following factors on incidence and recovery:

- (a) age;
- (b) gender;
- (c) baseline CIS-R score (categorised as 0–5, 6–11, 12–17 and 18+, with scores above 11 indicating the presence of psychiatric morbidity);
- (d) marital status;
- (e) size of primary support group (the number of people respondents reported feeling close to or described as good friends, including relatives and others they lived with);
- (f) life events (the total number of positive responses to a list of 18 major life events, including sexual abuse, serious relationship problems, job loss, serious illness or death of a friend or relative);
- (g) the individual's occupational social class;
- (h) weekly income;
- (i) housing tenure;
- (j) unemployment (at the time of the interview);
- (k) substance misuse (in the year before the interview).

We assessed the effects on recovery of the following additional factors: counselling, antidepressant therapy and contact with health care professionals; these variables were self-reported by the survey members. The mean interval between the two interviews was 535 days (interquartile range 519–555).

Statistical methods

Analyses were carried out in Stata version 7.0 (Stata, 2001) using the SVY family of commands designed specifically for data from sample surveys to take account of the complex sample design. The sample weighting adjusted the age, gender and geographic distribution of the sample to that of the national population, and also accounted for selection probability for the follow-up survey (all those with CIS-R scores above 5 at the initial survey, but only 1 in 5 of those with CIS-R scores of 0–5)

and a correction for differential non-response. Percentage rates were obtained using SVYTAB. To calculate the annual incidence of suicidal thoughts we assumed constant incidence over the 18-month follow-up; as such an assumption is improbable for recovery, we present 18-month recovery rates. Odds ratios and confidence intervals were calculated using SVYLOGIT. Tests for interaction were performed using SVYTEST to calculate adjusted Wald tests.

Our initial models examined associations with each of the explanatory variables in men and women separately controlling for age (in 10-year age bands) and baseline CIS-R score (in four bands). To investigate gender differences in the patterns of association we fitted interaction terms between gender and the following variables:

- (a) baseline CIS-R score;
- (b) change in CIS-R score;
- (c) age;
- (d) marital status;
- (e) size of the primary support group;
- (f) life events;
- (g) social class;
- (h) unemployment;
- (i) income.

We fitted a final multivariable model using data from men and women combined and including all the factors shown in the initial models to be associated ($P < 0.20$) with the incidence of suicidal thoughts after controlling for age and CIS-R score.

We examined the influence of change in CIS-R score, newly occurring life events, change in income and employment status over the follow-up period on the incidence of suicidal thoughts. For all other variables too few people experienced a change in status over the follow-up period to enable investigation of these changes. As only around half of the respondents reported precise household income at baseline and follow-up, but 96% reported individual income at both time points, our analysis of change in income is based on change in the individual's income.

RESULTS

Factors associated with the development of suicidal thoughts

Of the 2404 study members, 2240 had not experienced suicidal thoughts in the year

before the baseline interview; 129 of them reported experiencing suicidal thoughts subsequently. The age-adjusted overall annual incidence of suicidal thoughts was 2.3% (95% CI 1.8–2.9); in men this was 2.0% (95% CI 1.3–3.1) and 2.6% (95% CI 2.0–3.4%) in women. With a broader definition of suicidal thoughts including the two additional questions ('Have you felt that life was not worth living?' and 'Have you wished that you were dead?'), the corresponding incidences are 3.8% (95% CI 3.1–4.7) overall; men 2.8% (95% CI 2.0–4.0), women 4.8% (95% CI 3.8–6.0).

Table 1 presents the association of age and CIS-R with the development of suicidal thoughts. With the exception of those aged 16–24 years, who had a risk 2–3 times greater than most other age groups, the incidence of suicidal thoughts varied little with age but was strongly associated with CIS-R score at baseline: compared with those scoring 0–5, those with scores of 18 and over had a risk that was 8 times greater in men and 28 times greater in women. There was weak evidence that the effect of age on risk differed in men and women ($P_{\text{interaction}} = 0.063$). The effect of CIS-R on risk also showed an apparent difference between the genders ($P_{\text{interaction}} = 0.072$), with a higher risk in women with CIS-R scores above 5 than in men.

Associations adjusted for age and CIS-R of social and economic variables with the occurrence of suicidal thoughts are shown in Table 2. Married, cohabiting and widowed individuals were the least likely to develop suicidal thoughts. Divorced, separated and single individuals were approximately twice as likely as married individuals to develop suicidal thoughts, after adjusting for age and CIS-R score at the first interview. The development of suicidal thoughts was associated with having a small support group and experiencing more life events prior to the baseline interview. There was statistical evidence that the associations with life events were stronger in women than in men ($P_{\text{interaction}} = 0.028$), but this was not the case for the size of the primary support group ($P_{\text{interaction}} = 0.16$). Measures of low socio-economic position – low income, low occupational social class, living in rented accommodation and unemployment – were associated with increased risk. Although associations of some of the measures of socio-economic position were stronger in men than in women, there was no strong

Table 1 Unadjusted associations of age and baseline CIS–R score with the development of suicidal thoughts

	Men			Women		
	No suicidal thoughts at baseline	Developed suicidal thoughts	OR (95% CI)	No suicidal thoughts at baseline	Developed suicidal thoughts	OR (95% CI)
	<i>n</i>	<i>n</i>		<i>n</i>	<i>n</i>	
Age, years						
16–24	91	7	1.00	101	14	1.00
25–34	169	6	0.22 (0.06–0.82)	276	19	0.42 (0.19–0.92)
35–44	211	12	0.35 (0.12–1.04)	274	22	0.56 (0.23–1.37)
45–54	203	7	0.14 (0.04–0.51)	258	14	0.49 (0.20–1.25)
55–64	157	9	0.31 (0.09–1.12)	205	10	0.28 (0.11–0.71)
65–74	118	5	0.35 (0.07–1.67)	177	4	0.08 (0.02–0.25)
CIS–R score at baseline			<i>P</i> =0.059			<i>P</i> <0.001
0–5	426	11	1.00	358	4	1.00
6–11	299	13	1.63 (0.59–4.48)	523	31	12.05 (3.76–38.60)
12–17	125	9	5.09 (1.73–14.97)	227	23	21.12 (6.84–65.28)
18+	99	13	8.30 (3.04–22.63)	183	25	27.96 (7.85–99.60)
			<i>P</i> =0.001			<i>P</i> <0.001

CIS–R, Clinical Interview Schedule – Revised.

statistical evidence of effect modification. Values of *P* for interaction between gender and social class and between gender and unemployment were 0.36 and 0.18 respectively.

In the multivariable model (Table 3), based on combined data from both genders, associations with marital status and size of the primary support group were little changed, and the association with life events was somewhat attenuated. In contrast, associations with the economic variables – social class, income and housing tenure – were greatly attenuated, although the association with unemployment was little changed. This attenuation was largely due to the fact that all four measures of economic position were correlated with one another, and was not due to controlling for the other social and life event measures.

Incidence of suicidal thoughts in relation to change in risk factors

Compared with those whose CIS–R score changed by less than 6 points over the 12-month follow-up, people whose score increased by 6 points or more were at greatly increased risk of developing suicidal thoughts (OR=9.9, 95% CI 5.3–18.4) (Table 4). Likewise, reduction in CIS–R score by 6 points or more was associated with a reduced risk of developing suicidal thoughts (OR=0.3, 95% CI 0.1 to 0.6). Twenty-six people lost their job between

the baseline and follow-up interview – compared with those who remained employed, these individuals had an almost fourfold greater risk of developing suicidal thoughts. The 29 people who were unemployed at both assessments had a fourfold increased risk of developing suicidal thoughts. Changes in the individual's income were not associated with risk of developing suicidal thoughts.

Factors associated with recovery from suicidal thoughts

A total of 164 participants reported having experienced suicidal thoughts in the 12 months before the initial interview, of whom 84 reported no longer experiencing them at the follow-up interview. After adjustments for the sampling fraction, the age- and gender-standardised recovery rate at 18 months was 56.8% (95% CI 46.5–66.5); men 53.3% (95% CI 38.1–67.9) and women 59.9% (95% CI 46.9–71.7).

Patterns of recovery in relation to age, gender and baseline CIS–R score are shown in Table 5. Odds ratios greater than 1 indicate factors associated with recovery. Recovery was somewhat more likely in women and in those aged <25 and 65–74 years, and was strongly associated with having a low CIS–R score at baseline. Social and economic factors associated with a lower likelihood of recovery were similar to those associated with the risk of

occurrence although, because of the small sample size, the effect estimates have wide confidence intervals including 1.00 (Table 6). Those who were unemployed at the time of the initial interview had a markedly reduced likelihood of recovery (adjusted OR=0.24, 95% CI 0.04–1.49). The economically inactive (homemakers, retired people and students) also had less likelihood of recovery (adjusted OR=0.28, 95% CI 0.12–0.65). The power for detecting differences between the genders in relation to recovery was low, but an apparent difference was found between men and women in regard to employment status ($P_{\text{interaction}}=0.016$): the likelihood of recovery for unemployed or economically inactive men (adjusted OR=0.08, 95% CI 0.02–0.29) relative to employed men was worse than for the same comparison in women (adjusted OR=0.40, 95% CI 0.12–1.31). Similarly, a gender difference was found in the effects of income on recovery ($P_{\text{interaction}}=0.003$): low-income men were less likely to recover than low-income women.

Recovery in relation to change in risk factor status

Improvements in CIS–R score were the strongest predictor of recovery from suicidal thoughts. Compared with those whose CIS–R score changed by only 5 units, those with an increase in CIS–R score of 6 or

Table 2 Associations of social and economic factors with the development of suicidal thoughts, adjusted for age and baseline CIS–R score

	Men			Women		
	No suicidal thoughts at baseline <i>n</i>	Developed suicidal thoughts <i>n</i>	OR (95% CI) ¹	No suicidal thoughts at baseline <i>n</i>	Developed suicidal thoughts <i>n</i>	OR (95% CI) ¹
Marital status						
Married/cohabiting	596	21	1.00	782	33	1.00
Single	208	15	2.32 (0.82–6.57)	186	21	2.19 (0.79–6.10)
Widowed	31	0	0	113	3	0.96 (0.25–3.74)
Divorced/separated	114	10	2.24 (0.76–6.55)	210	26	4.02 (1.93–8.36)
			<i>P</i> =0.15 ²			<i>P</i> =0.002
Size of primary support group, <i>n</i>						
0–3	62	4	1.55 (0.37–6.55)	65	11	2.01 (0.93–4.34)
4–8	261	21	3.33 (1.33–8.37)	430	33	1.31 (0.75–2.29)
9 or more	623	20	1.00	788	39	1.00
			<i>P</i> =0.027 ³			<i>P</i> =0.089 ³
Stressful life events before baseline, <i>n</i>						
0–3	399	17	1.00	636	18	1.00
4–5	287	14	1.06 (0.42–2.65)	366	29	3.19 (1.45–7.01)
6+	263	15	1.09 (0.44–2.66)	289	36	4.27 (2.00–9.14)
			<i>P</i> =0.86 ³			<i>P</i> <0.001 ³
Social class						
I, II	394	13	1.00	442	31	1.00
III (NM)	93	4	0.90 (0.15–5.49)	432	20	0.49 (0.23–1.04)
III (M)	287	13	1.89 (0.78–4.57)	115	9	1.06 (0.46–2.41)
IV	111	9	2.39 (0.69–8.34)	180	16	1.24 (0.60–2.56)
V	39	6	2.43 (0.57–10.43)	87	6	1.11 (0.42–2.98)
			<i>P</i> =0.050 ³			<i>P</i> =0.56 ³
Weekly household income, £						
400 and over	402	15	1.00	492	26	1.00
200–399	221	7	0.54 (0.15–2.01)	316	19	1.37 (0.62–3.04)
100–199	117	10	3.98 (0.85–18.53)	258	26	2.06 (1.13–3.73)
Under 100	69	9	2.95 (0.75–11.68)	117	6	0.87 (0.28–2.72)
			<i>P</i> =0.11 ³			<i>P</i> =0.26 ³
Housing tenure						
Owned (outright or mortgage)	705	24	1.00	913	44	1.00
Rented	238	21	2.02 (0.85–4.79)	369	39	1.54 (0.90–2.63)
			<i>P</i> =0.11			<i>P</i> =0.12
Employment status						
Working (full/part-time)	650	23	1.00	734	42	1.00
Unemployed	36	2	4.68 (0.61–36.20)	36	4	0.91 (0.31–2.70)
Economically inactive	261	20	1.70 (0.58–5.01)	513	37	1.67 (0.93–3.01)
			<i>P</i> =0.25			<i>P</i> =0.19
Dependent on alcohol in past year						
No	734	35	1.00	1220	78	1.00
Yes	213	11	1.06 (0.45–2.54)	65	4	1.01 (0.31–3.29)
			<i>P</i> =0.89			<i>P</i> =0.99
Used any illegal drug in past year						
No	797	36	1.00	1183	71	1.00
Yes	151	10	2.82 (0.84–9.50)	102	11	1.21 (0.52–2.81)
			<i>P</i> =0.094			<i>P</i> =0.65

CIS–R, Clinical Interview Schedule – Revised; M, manual; NM, non-manual. Treatment of missing data: variable-by-variable.

1. Adjusted for age in six 10-year bands, baseline CIS–R in four bands.

2. Confidence interval of OR for widowed males cannot be estimated; *P* value is for test over other three categories.

3. Tests for trend.

Table 3 Multivariate model of associations of social and economic factors with development of suicidal thoughts

	Adjusted for age, gender and CIS-R ¹ OR (95% CI)	Fully adjusted ² OR (95% CI)
Marital status		
Married/cohabiting	1.00	1.00
Single	2.20 (1.10–4.39)	2.77 (1.47–5.23)
Widowed	0.45 (0.12–1.67)	0.43 (0.10–1.75)
Divorced/separated	3.47 (1.92–6.29)	2.92 (1.37–6.24)
	<i>P</i> < 0.0001	<i>P</i> = 0.0001
Size of primary support group, <i>n</i>		
0–3	2.01 (0.98–4.09)	1.97 (0.91–4.25)
4–8	2.07 (1.23–3.48)	2.08 (1.23–3.52)
9 or more	1.00	1.00
	<i>P</i> = 0.002 ³	<i>P</i> = 0.004 ³
Stressful life events before baseline, <i>n</i>		
0–3	1.00	1.00
4–5	1.92 (1.01–3.64)	1.52 (0.77–3.01)
6+	2.39 (1.34–4.27)	1.44 (0.75–2.77)
	<i>P</i> = 0.003 ³	<i>P</i> = 0.21 ³
Social class		
Non-manual: I–III	1.00	1.00
Manual: III–V	1.83 (1.14–2.94)	1.29 (0.79–2.10)
	<i>P</i> = 0.014	<i>P</i> = 0.32
Household weekly gross income		
£200 and over	1.00	1.00
Under £200	2.14 (1.06–4.34)	0.77 (0.40–1.47)
	<i>P</i> = 0.035	<i>P</i> = 0.42
Housing tenure		
Owned (outright or mortgage)	1.00	1.00
Rented	1.74 (1.07–2.84)	1.14 (0.69–1.89)
	<i>P</i> = 0.027	<i>P</i> = 0.61
Employment status at baseline		
Working full/part-time	1.00	1.00
Unemployed	2.81 (0.60–13.09)	3.23 (0.81–12.82)
Economically inactive	1.77 (1.04–3.00)	3.10 (1.64–5.83)
	<i>P</i> = 0.063	<i>P</i> = 0.002

CIS-R, Clinical Interview Schedule – Revised.

Sample consisted of 2095 individuals with data on all above variables, of whom 117 experienced incident suicidal thoughts.

1. Adjusted for age in three bands (16–24, 25–54, 55–74), CIS-R score in four bands, plus gender–score interaction.

2. Also adjusted for all other variables in table.

3. Tests for trend.

more had a markedly reduced likelihood of recovery (OR=0.13, 95% CI 0.03–0.54). In contrast, those whose score decreased by 6 or more points had a greater likelihood of recovery (OR=2.86, 95% CI 1.17–7.00). Individuals who were in employment at both interview points were most likely to recover, but few suicidal individuals changed their employment status between the two interviews. There was no evidence that change in an individual's

income was associated with recovery ($P_{\text{trend}}=0.66$). There was weak evidence that life events occurring since the baseline interview prevented recovery ($P_{\text{trend}}=0.13$).

Influence of health care on recovery

We examined whether people who reported taking antidepressant medication or being under the care of their general practitioner,

a counsellor or other mental health professional were more likely to have recovered by the 18-month follow-up interview than those not receiving such care at baseline (Table 7). We found that those in receipt of such treatment were less likely to recover, even after controlling for disease severity at baseline as indexed by CIS-R score. This finding of a lack of benefit from health care intervention was unaltered when we restricted our analysis to those reporting suicidal thoughts in the week before the baseline interview and used as a measure of recovery suicidal thoughts in the week before the follow-up interview.

DISCUSSION

Approximately 1 in 38 adult women and 1 in 50 adult men in Britain develop suicidal thoughts every year. Around half of adults with suicidal thoughts no longer experience them 18 months later. Onset is more frequent in women; those aged 16–24 years; people who are not married, cohabiting or widowed; people with low levels of social support or who have experienced several life events; those from poor socioeconomic backgrounds; and the unemployed. Similar factors are associated with the persistence of suicidal thoughts, although in contrast to patterns of incidence, those aged 16–24 years were more likely than older people to recover. The strongest predictor of incidence and recovery is the level of psychiatric morbidity, as indexed by the CIS-R score.

The evidence that those receiving antidepressants, counselling or in contact with health care professionals were less likely to recover contrasts with the well-documented beneficial effects of some therapies (Freemantle *et al*, 1993). It is likely that the observed patterns reflect biases due to differences in disease severity in those receiving and not receiving treatment which were inadequately controlled for in models adjusting for CIS-R scores.

Strengths and limitations of the study

To the best of our knowledge, this is the largest prospective investigation of the incidence of suicidal thoughts worldwide. The large study and sampling procedure meant we had sufficient power to investigate factors associated both with incidence and recovery. The detailed measures of

Table 4 Associations of change in circumstances with the development of suicidal thoughts, adjusted for age and baseline CIS–R score

	No suicidal thoughts at baseline <i>n</i>	Developed suicidal thoughts <i>n</i>	OR (95% CI) ¹
Change in CIS–R score			
–35 to –6	559	18	0.29 (0.14–0.59)
–5 to +5	1445	61	1.00
+6 to +35	236	50	9.83 (5.26–18.38)
			<i>P</i> < 0.0001
Life events since baseline interview, <i>n</i>			
None	972	29	1.00
1 to 2	1123	69	2.51 (1.31–4.80)
3 or more	145	31	7.58 (3.70–15.51)
			<i>P</i> < 0.0001 ²
Change in individual income			
Decrease around 20% or more	270	16	0.78 (0.38–1.63)
About the same	1372	77	1.00
Increase around 20% or more	509	31	0.75 (0.38–1.49)
			<i>P</i> = 0.70 ²
Change in employment status			
Employed at <i>t</i> ₁ and <i>t</i> ₂	1280	59	1.00
Employed at <i>t</i> ₁ , unemployed at <i>t</i> ₂	23	3	3.70 (0.91–15.14)
Unemployed at <i>t</i> ₁ , employed at <i>t</i> ₂	36	3	0.86 (0.20–3.72)
Unemployed at <i>t</i> ₁ and <i>t</i> ₂	26	3	13.99 (1.63–120.06)
Economically inactive at <i>t</i> ₁ or <i>t</i> ₂	865	60	1.64 (0.96–2.78)
			<i>P</i> = 0.025

CIS–R, Clinical Interview Schedule – Revised; *t*₁, time 1 (baseline assessment); *t*₂, time 2 (follow-up assessment).

1. Adjusted for gender, age in six 10-year bands and baseline CIS–R in four bands. Treatment of missing data:

variable-by-variable.

2. Tests for trend.

Table 5 Unadjusted associations of gender, age and baseline CIS–R score with recovery from suicidal thoughts

	Suicidal thoughts at baseline <i>n</i>	Recovered from suicidal thoughts <i>n</i>	OR ¹ (95% CI)
Gender			
Male	70	34	1.00
Female	94	50	1.31 (0.59–2.89)
			<i>P</i> = 0.50
Age, years			
16–24	26	16	1.00
25–34	40	22	0.61 (0.18–2.04)
35–44	40	19	0.86 (0.24–3.04)
45–54	36	14	0.60 (0.16–2.32)
55–64	14	9	0.82 (0.17–4.06)
65–74	8	4	2.07 (0.35–12.29)
			<i>P</i> = 0.78
CIS–R score at baseline			
0–5	10	9	1.00
6–11	40	23	0.08 (0.01–0.71)
12–17	29	17	0.07 (0.01–0.70)
18+	85	35	0.04 (0.00–0.35)
			<i>P</i> = 0.017

CIS–R, Clinical Interview Schedule – Revised.

1. Odds ratios greater than 1 indicate factors associated with recovery.

psychiatric morbidity meant we could investigate the effect of risk factors independent of the degree of psychopathology. There are two main limitations. First, only two-thirds of those sampled in the baseline and follow-up surveys were interviewed. Such levels of non-response are typical of those found in studies of this sort. Our weighting procedures took account of differential non-response with respect to the measured characteristics of survey members; however, our estimates of risk factor associations might be biased if their relationship with the occurrence of suicidal thoughts differed in those who were and were not interviewed. We anticipate that these effects would lead to underestimation of incidence and overestimation of recovery, as those with psychiatric disorder are less likely to respond to surveys of this sort. We have no reason to believe that risk factor associations would differ between those interviewed and the non-responders. The second main limitation is that the measurement of suicidal thoughts depends upon self-report and recall over an 18-month period. It is possible that there are gender and social class biases in the reporting of psychological symptoms in interviews of this sort, with men and people from lower social class backgrounds under-reporting symptoms, thereby distorting patterns of association (Stansfeld & Marmot, 1992; Piccinelli & Wilkinson, 2000).

Our definition for suicidal thoughts (a positive response to the question ‘Have you thought of taking your life, even if you would not really do it?’) is somewhat weaker than that used in some analyses (Kessler *et al*, 1999; Hintikka *et al*, 2001). For example, Hintikka *et al* (2001) defined suicidal thoughts as positive responses to the questions ‘I have definite plans to commit suicide’ and ‘I would kill myself if I had the chance’. Some people who responded ‘yes’ to our question might have been at lower suicide risk than those responding positively to Hintikka’s. Suicide risk is likely to be higher among some subgroups of patients, for example those whose thoughts include the formulation of specific plans for suicide. We investigated the effects of using a wider definition of suicidal thoughts, including notions of life-weariness as used in other studies (Goldney *et al*, 2000; Watson *et al*, 2001). This resulted in an approximately 50% higher estimate of incidence. However, multivariable analysis of the data-set using

Table 6 Associations of social and economic factors with recovery from suicidal thoughts, adjusted for age, gender and baseline CIS–R score

	Suicidal thoughts at baseline <i>n</i>	Recovered from suicidal thoughts <i>n</i>	OR (95% CI) ¹
Marital status			
Married/cohabiting	60	31	1.00
Single	52	24	0.43 (0.16–1.14)
Widowed	14	7	0.66 (0.11–3.86)
Divorced/separated	38	22	1.06 (0.38–2.97)
			<i>P</i> =0.34
Size of primary support group, <i>n</i>			
0–3	28	9	0.45 (0.17–1.16)
4–8	79	46	1.31 (0.49–3.51)
9 or more	56	29	1.00
			<i>P</i> =0.34 ²
Stressful life events before baseline, <i>n</i>			
0–3	39	22	1.00
4–5	44	28	1.01 (0.36–2.81)
6+	81	34	0.49 (0.20–1.23)
			<i>P</i> =0.17 ²
Social class			
I, II	43	25	1.00
III (NM)	30	19	0.43 (0.13–1.38)
III (M)	24	11	0.39 (0.11–1.33)
IV	41	19	0.30 (0.10–0.91)
V	14	6	0.46 (0.10–2.22)
			<i>P</i> =0.042 ²
Weekly household income, £			
400 and over	43	26	1.00
200–399	42	24	0.65 (0.21–2.06)
100–199	38	17	0.56 (0.16–1.91)
Under 100	24	8	0.35 (0.11–1.13)
			<i>P</i> =0.11 ²
Housing tenure			
Owned (outright or mortgage)	87	49	1.00
Rented	75	35	0.64 (0.27–1.53)
			<i>P</i> =0.31
Employment status			
Working (full/part-time)	84	56	1.00
Unemployed	8	3	0.24 (0.04–1.49)
Economically inactive	70	25	0.28 (0.12–0.65)
			<i>P</i> =0.011
Dependent on alcohol in past year			
No	133	72	1.00
Yes	30	12	0.59 (0.18–1.94)
			<i>P</i> =0.38
Used any illegal drug in past year			
No	123	64	1.00
Yes	40	20	1.26 (0.50–3.21)
			<i>P</i> =0.62

CIS–R, Clinical Interview Schedule – Revised; M, manual; NM, non-manual.

1. Odds ratios greater than 1 indicate factors associated with recovery. Adjusted for gender, age in six 10-year bands, baseline CIS–R score in four bands. Treatment of missing data: variable-by-variable.

2. Tests for trend.

this wider definition did not alter our main findings (results not shown).

Comparison with other studies

The only other prospective investigation of suicidal thoughts in a general population sample of men and women that we are aware of is a questionnaire follow-up of 1600 people in Finland (Hintikka *et al*, 2001). The Finnish study reported risks of similar magnitude to those seen in our study for levels of mental illness, unemployment and alcohol misuse. In keeping with our finding, associations with unemployment were strongest in men (Hintikka *et al*, 2001). In contrast to our finding, the Finnish study reported a higher incidence of suicidal thoughts in men than in women; this is at odds with most other studies of this issue (Weissman *et al*, 1999). It is noteworthy that Helsinki was the only centre in the World Health Organization multicentre study of self-harm where there were more episodes in men than in women (Michel *et al*, 2000). Our finding of a high incidence of suicidal thoughts in those aged 16–24 years supports those of previous UK studies (Paykel *et al*, 1974; Thomas *et al*, 2002) as well as other national cross-sectional research (Kessler *et al*, 1999; Kuo *et al*, 2001; Renberg, 2001), although age associations differ in Iceland (Vilhjalmsson *et al*, 1998).

How closely do the risk factors for suicidal thoughts follow those for suicide?

Few prospective studies have investigated social and economic risk factors for suicide. The magnitude of the increased risk of suicidal thoughts in relation to marital status, low income, unemployment and substance misuse are broadly similar to risks associated with these factors and suicide (Andreasson *et al*, 1988; Kreitman, 1988; Lewis & Sloggett, 1998; Kposowa, 2000; Qin *et al*, 2000). We found that associations with measures of poverty – occupational social class, income and housing – were greatly attenuated in models controlling for unemployment (see Table 4). A similar effect has been shown in relation to the association of occupational social class with suicide in a UK-based cohort study (Lewis & Sloggett, 1998). These findings indicate that the adverse effects of poverty on suicide risk might be mediated by unemployment and greater

Table 7 Associations of receipt of treatment with recovery from suicidal thoughts, adjusted for age, gender and baseline CIS–R score

	Suicidal thoughts at baseline <i>n</i>	Recovered from suicidal thoughts <i>n</i>	OR (95% CI) ¹
Received counselling			
No	134	73	1.00
Yes	30	11	0.51 (0.18–1.41) <i>P</i> =0.19
Spoke to a GP in the past year about mental, nervous or emotional problem			
No	74	48	1.00
Yes	90	36	0.49 (0.22–1.10) <i>P</i> =0.082
Reported taking antidepressant medication			
None reported	119	73	1.00
Reported	45	11	0.41 (0.16–1.01) <i>P</i> =0.053
Consulted a mental health professional in past year			
No	132	71	1.00
Yes	32	13	0.52 (0.23–1.19) <i>P</i> =0.12

CIS–R, Clinical Interview Schedule – Revised; GP, general practitioner.

1. Odds ratios greater than 1 indicate factors associated with recovery. Adjusted for gender, age in six 10-year bands, baseline CIS–R score in four bands. Treatment of missing data: variable-by-variable.

job insecurity among those from poorer backgrounds.

Gender patterns of suicide and suicidal thoughts differ markedly. Although male rates of suicide exceed female rates by approximately 3:1 (Kelly & Bunting, 1998), the incidence of suicidal thoughts is around 30% higher in women than in men. There are a number of possible explanations for the gender differences in suicide and suicidal thoughts. First, they may reflect contrasting prevalences of protective factors, such as social support and help-seeking, in men and women. Several studies indicate that men are less likely than women to seek medical help for psychological problems and prior to suicide (Olfson & Klerman, 1992; Foster *et al*, 1997; Biddle *et al*, 2004). Second, risk factors or protective factors may have different effects in men and women (Qin *et al*, 2000). Finally, as men tend to use more lethal methods of suicide (firearms, hanging) than women (overdose), gender differences in fatality rates following

suicide attempts may contribute to the gender differences in suicide (Appleby, 2000).

The different age patterns of suicide and suicidal thoughts are similarly striking. Rates of suicide are lowest among those aged 16–24 years (Kelly & Bunting, 1998), the incidence of suicidal thoughts is highest in men and women in this age group. Not only is the incidence of suicidal thoughts highest in the youngest age group, but so too are rates of recovery (although this latter effect was weak). This difference in the age patterning between suicidal thoughts and suicide is similar to the discordance in the age patterning between deliberate self-harm and suicide (Hawton *et al*, 1997). Perhaps suicidal thoughts, and consequent impulsive actions, are an indicator of the rapid mood swings and changes in life circumstances that surround the move from childhood to young adulthood. Their transience means not only that they may be less likely to result in carefully planned (and therefore successful) suicide

but also that detection of suicide risk and suicide prevention in this age group is particularly challenging.

Suicidal thoughts and suicide prevention

The annual incidence of suicidal thoughts in this survey (approximately 2%) is around 200 times higher than the annual incidence of suicide (1 per 10 000: Department of Health, 2002). This indicates that high-risk approaches to prevention based simply on the detection and management of all those experiencing suicidal thoughts as defined in this study would be extremely inefficient unless accompanied by sophisticated understanding of the factors that exacerbate risk. It is therefore important to understand the pathways (protective and precipitating) linking suicidal thoughts to completed suicide. Factors important in such pathways are likely to be those associated with recovery from suicidal thoughts (see above), help-seeking behaviours and the recognition and treatment of those at risk of suicide by health care professionals.

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CLINICAL IMPLICATIONS

- In Britain, 1 in 38 adult women and 1 in 50 men develop suicidal thoughts in a year but less than 1 in 200 of these people kill themselves. In contrast to suicide, suicidal thoughts are reported more commonly by women.
- Over half of people experiencing suicidal thoughts recover from these over an 18-month period.
- With the exception of gender and young age, the social and economic risk factors for suicidal thoughts are similar to those for suicide. An understanding of the factors preventing suicide in women and young people who experience suicidal thoughts will inform suicide prevention strategies.

LIMITATIONS

- Only two-thirds of those sampled in the baseline and follow-up surveys were interviewed.
- The measurement of suicidal thoughts depends upon self-report. It is possible that men and those from more affluent backgrounds are reluctant to report psychological symptoms in interviews of this sort, distorting patterns of association.
- Our estimates of incidence and recovery from suicidal thoughts were based on recall of the occurrence of suicidal thoughts in the 18 months since the baseline interview; poor recall may influence the accuracy of these estimates.

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