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The Distribution of Well-Being in Ireland

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Abstract

Objectives: There is a substantial knowledge gap about the distribution of mental heath in community populations. The European Social Survey is particularly useful as it contains information on over 40,000 individuals, including 2,286 Irish adults. The objective of this study is to conduct a large scale statistical analysis to examine the distribution and determinants of mental well-being in a large representative sample of the Irish population.

Method: Analysis of the European Social Survey using robust multiple linear and non-linear regression techniques. The data-set contains WHO-5 scores and subjective well-being for a sample of 2,286 Irish people interviewed in their homes in 2005.

Results: Ireland has the second highest average WHO-5 score among the 22 countries in the European Social Survey. Multiple linear regression analysis across the distribution of WHO-5 reveals a well-being gradient largely related to education and social capital variables. A probit model examining the determinants of vulnerability to psychiatric morbidity reveals that a similar set of factors predict scores below the threshold point on the WHO-5 scale.

Conclusions: The results are consistent with marked differences in mental well-being across education levels and variables relating to social capital factors. Such indicators provide a useful index for policy-makers and researchers. However, much further work is needed to identify causal mechanisms generating observed differences in mental health across different socioeconomic groups.

Keywords: Psychological well-being, WHO-5.

Introduction

The extent to which mental health is socially determined has become an increasingly researched area in the international literature. This paper estimates a statistical model relating psychological well-being to a set of social and demographic variables utilising a large-scale population-based survey. It provides the first set of detailed statistical tests of the effects of social capital and labour market factors on well-being and vulnerability to depression in Ireland.

The availability of individual level information in large representative non-clinical samples is an globally important development in the measurement and analysis of psychological health.[1,2] As there is no national morbidity survey of mental health problems in Ireland[3], there is no comprehensive dataset on the prevalence and incidence of depressive disorders in the country. Key data on the scale of depressive disorders may be found in the "Most Recent Activities of Irish Psychiatric Units and Hospitals" report[4] and the Outcome of Depression International Network (ODIN) study[5]. From these, we see that admissions to Irish psychiatric units were highest for depressive disorders (216.8 per 100,000 population), and that urban parts of Ireland have amongst the highest prevalence of depressive disorder in Europe.

As well as estimating incidence and prevalence of mental health problems, it is also important to estimate predictive factors for vulnerability. Consistent with other countries, there is much evidence to show a marked social gradient to all health problems in Ireland, including psychiatric diseases[6,7,8,9,10,11]. One study uses income as a predictor of psychological distress (as measured by GHQ-12 scores) in a panel sample of Irish households and finds that symptoms worsen as a function of lower income.[12] There is also strong evidence for other socio-economic factors in predicting psychiatric morbidity.

Demographic breakdowns of Irish psychiatric admissions for 2004, show that admission rates for depressive disorders increased with age until 65 years, after which they declined.[13] Rates for depressive disorders were highest among widowed and divorced persons.

Large-scale studies of the psychological well-being of the Irish population are rare. However, there are several data-sets available that provide very useful information in this regard but have not been widely used for this purpose. Most notably, the European Community Household Panel survey (ECHP) was conducted in Ireland from between 1994 and 2001 and contains information on subjective life satisfaction across a number of domains, as well as the GHQ-12 measure of psychological distress. Furthermore, the Eurobarometer has collected information on subjective happiness and life satisfaction since the early 1970s. The European and World Values surveys, along with the Study of Lifestyle Attitudes and Nutrition (SLAN) and the International Social Survey Programme (ISSP) surveys also contain elements of happiness and life satisfaction questions. All of this information is readily available (see the Irish Social Science Data Archive). The Survey of Health, Ageing and Retirement in Europe (SHARE) will be conducted in Ireland in 2007 and will provide detailed comparable information on mental health. A substantial advantage of using population screening methods is that it potentially offers more detailed information about individuals who are susceptible to mental illness, but who have not had direct contact with clinical services.

The 2005 European Social Survey (ESS), which has not previously been examined in this context, is particularly useful as it contains information on over 40,000 individuals, including 2,286 Irish adults.

The scientific rigour and comparability of the ESS make it a unique resource for statistically examining the determinants of well-being in Ireland and placing this in a comparative context. These data provide information on two important classes of well-being predictors:

Socio-demographic factors and labour market characteristics

Socio-economic factors and their relation to health and well-being are widely discussed. Of particular importance, the inclusion of measures of education and household income enables us to test for a social gradient with relation to well-being and vulnerability. We can also examine the extent to which well-being is affected by gender, health status, age and the presence of children. Many studies have found that socio-demographic factors play an important role in explaining inter-individual variability in well-being[14,15,16] and depressive symptoms[17,18], as well as in physical morbidity[19,20,21,22].

Several recent studies have pointed to effects of labour market variables in conditioning mental well-being. For example, recent evidence supports the links between income, particularly comparative income, and well-being[23,24,25], as well as between unemployment and well-being, with considerable evidence also supporting the mediating role of social norms or reference effects for unemployment.[26] One study using panel data found the well-being of unemployed individuals is strongly and positively correlated with the reference group unemployment rate at the regional, partner, or household level. [27] This result was stronger for men and was robust to controls for unobserved individual heterogeneity.

In differentiating the subjective well-being of the unemployed, the combined effect of the economic need for employment and the psychosocial need for employment is the preferred explanatory model.[28,29] Evidence of the "non-pecuniary cost of unemployment and findings such as "the comparison income effect" appear to reinforce the argument[30] that as societies grow wealthy, differences in well-being are less frequently due to income, and more frequently the cause of social capital factors. Furthermore, there has been a strong emphasis in the social psychiatric epidemiological literature on the role of job control and hierarchical status in determining health and well-being.[20, 21]

Social Capital Characteristics

The effects of access to social opportunities, having someone to confide in, associational membership and feelings of trust are all used as indicators of the quality of a person or communities' social interactions. The role of non-pecuniary factors in determining population-levels of well-being and mental health has been well supported within the literature [31,32,33,34].

Method

Data

Data are derived from the Irish round of the European Social Survey 2005. Of the 45,681 adults interviewed across Europe, 2,286 were Irish. 45,253 individuals, including 2,246 Irish adults, completed all aspects of the WHO-5 questionnaire. Respondents were interviewed face-to-face by interviewers from the Economic and Social Research Institute.

WHO-Five Index

WHO-Five Well-being Index[35]. The WHO-5 is a shortened form of a wider well-being index, designed to overcome one main problem with psychiatric screening indices, namely the tendency to underreport negative symptoms. As the WHO-Five measures vulnerability to morbidity by examining responses to questions about positive functioning, it is argued that social pressures with regard to reporting depressive symptoms are minimised[36]. The WHO-Five is recommended for use as a first-stage screening tool for detection of depressive disorders in primary care. There have been several scientific endorsements of the WHO-5. In particular, the five-item has demonstrated similar levels of internal consistency to previous longer versions[37]. One study which compared the WHO-Five and the mental health subscale of the Short-Form 36 in their ability to prevent ceiling effects when applied to the general population found the WHO-Five to be less prone to ceiling effects and to have a better capacity to identify mental health deterioration.[38]

The five-item measure assesses subjective positive well-being, where participants are required to rate the presence or absence of each of the items in their lives, e.g. *"I have felt cheerful and in good spirits"*, on a six-point scale (0 to 5), ranging from *"at no time"* to *"all of the time"*. Low scores are taken to reflect possible depression and poorer quality of life. A cut-off range of 7-9 is recommended as appropriate for detecting any depressive disorder[39]. It is recommended to administer the Major Depression (ICD-10) Inventory or another depression diagnostic scale if the raw score is below 13 or if the patient has answered 0 or 1 to any of the five items.

The WHO-five can be used to measure change with a 10 per cent difference between time-points indicating clinical significance[40]. Psychometrically, Lowe et al.[41] give the figures for sensitivity, specificity and overall accuracy for variations in cut-off point for major depressive disorders, and demonstrate high internal consistency (Cronbach's alpha of 0.91).

Covariates

The covariates include a range of demographic variables (income, years of education, martial status, presence of children, age, gender), social capital characteristics (time spent watching television, level of trust scale, weekly socialising variables, discuss intimate/personal matters and level of religiosity), a health indicator and labour market characteristics (hours worked, contract type, control over work scale). Table 1 provides a description of the variables used in the analysis. All results are estimated using the STATA 9 statistical computing software package.

{INSERT TABLE 1 HERE}

Results

As can be seen in Figure 1, Ireland has the second highest well-being level in Europe next to Denmark. The distribution of the WHO-5 in Ireland is displayed in Figure 2. The mean WHO-Five score was 16.96 with a standard deviation of 4.9, on a scale of 0-25. Our statistical analysis proceeds by firstly examining the determinants of the overall level of WHO-5 utilising several multiple regression analyses. The models presented in Table 2 are a linear regression with robust standard errors. Our modelling proceeds in five steps described below.

{INSERT FIGURE 1 HERE]

{INSERT FIGURE 2 HERE]

Model 1 reveals a clear gradient related to education and income. Each income category adds .18 of a point to the WHO-Five scale, a result that is statistically significant and substantial. Similarly, each year of education adds .10 to the WHO-Five scale, a result which is also statistically significant and substantial. One issue that is pervasive in population level surveys is the presence of missing values for income. It is inefficient to simply exclude all the observations for which there are no income data, therefore to capture potential biases, we include a dummy variable indicating the 513 missing income values. There is clear evidence for a social gradient but not evidence that either income or education is causally related to well-being. As can be seen, there is very little evidence that the conclusions of the models are affected by the fact that there was some non-reporting of income.

{INSERT TABLE 2 HERE]

Model 2 augments the basic income/education model by including an expanded set of demographic variables as discussed above including age, gender, marital status and presence of children. As can be seen, there is no evidence that the social gradient related to income and education is generated by variation in these demographic variables since because the coefficients on both income and education remain very similar. Further tests reveal that, controlling for these other demographics, age does not have an effect on well-being. As expected, non-married individuals have substantially lower levels of well-being, particularly those who are separated. Furthermore, as shown in several previous studies[42], having dependent children has a negative effect on well-being, which has a substantially negative effect on well-being in this case.

Model 3 further augments the previous models by including measures of social capital, specifically: hours spent watching television; trust in other people and society; time spent socially with friends; engagement in social activities; the presence of someone to discuss intimate matters with; religiosity. Health status is also included. Interestingly, the strong initial effects observed from education disappear when one includes these social capital characteristics. As can be seen, the observed coefficients on both income and education are reduced substantially and are no longer statistically significant. In line with a social determination of health framework, time spent with friends, time spent socialising, religiosity and religious participation and trust all have positive effects on well-being. The presence of someone with whom to discuss intimate matters has a particularly strongly positive effect on well-being.

Model 4 augments Model 2 by including a selection of job market variables; particularly number of hours spent working per week; degree of control over one's working environment; and type of employment contract, yet none of the variables are statistically significant.

Model 5 is our final model. As can be seen, the effects of the social capital variables remain the same as in Model 3 and Model 4. Once again, there is no effect of income and education. Thus the social capital characteristics are sufficient to explain the income and education gradient in mental well-being. Furthermore, the inclusion of the labour market characteristics has little influence on the social capital coefficients.

Our second set of models presented in Table 3 analyse the determinants of being beneath the cut-off point as derived in the previous literature. We follow the same modelling procedure as above in terms of independent variable inclusions and the coefficients presented are marginal effects from a binary probit model.

Once again, we find marked effects of income and education when no controls are included, confirming the fact that there is a social gradient with regard to vulnerability to psychiatric morbidity. There is also evidence, as above, that a large part of this effect can be explained by social capital characteristics. However, unlike the above there is less evidence that job market variables have an effect on creating psychiatric vulnerability.

{INSERT TABLE 3 HERE]

Conclusions

This study has provided one of the first statistical estimations of the individual determinants of well-being in Ireland and provides a useful starting point for developing an empirical framework for assessing ideas emanating from the positive psychology literature. The data do not permit us to control for detailed regional characteristics nor access to psychological services. Also, there is an absence of personality factors that are clearly implicated in well-being within the dataset[43,44,45]. Furthermore, the cross-sectional nature of the data renders causal identification of parameters difficult. Yet the data do enable a rigorous specification of a baseline function for mental health in Ireland that can be followed up by later studies. The strengths of the study include the suitability of the WHO-5 index, the sample size made possible by the data availability and the statistical rigour involved in isolating key determinants of well-being. The study is thus a useful first step in identifying a well-being function for the general population that could be used to inform policy in Ireland.

The lack of a significant gender difference in mental health and well-being should not deflect from the fact that the determinants and consequences of mental health and well-being may be very different for men and women, something we will explore in later

work. Similarly, the lack of a substantial age effect should not be interpreted as implying that mental health does not have a significant life-course component. Rather, the results imply that simple models which postulate unambiguous decline do not explain this data and that more subtle approaches are needed. The same applies for labour market status. Simple models that relate the effect of number of hours and degree of seniority and autonomy to mental well-being do not explain this data. It is evident that if jobs affect mental health, then other factors are operant that will require more detailed measures.

There is clearly a social gradient with respect to mental well-being in Ireland in the sense that those with higher levels of education and income have higher levels of well-being. Furthermore, both well-being and vulnerability to depression are clearly predicted by the quality of social interactions and the presence of someone to confide in. Innovative research strategies for better assessing the direction of causality of this relationship will provide a useful clue as to the social determination of mental health in Ireland. Examining how exogenous changes in factors that determine quality of social interaction affect mental well-being is thus a key priority for future statistical research of this nature. Similarly, examining factors unrelated to mental health which determine the probability of marital breakdown may offer the potential to examine the independent effect of separation on mental health. At present, no existing Irish data allow us to disentangle these complex interactions.

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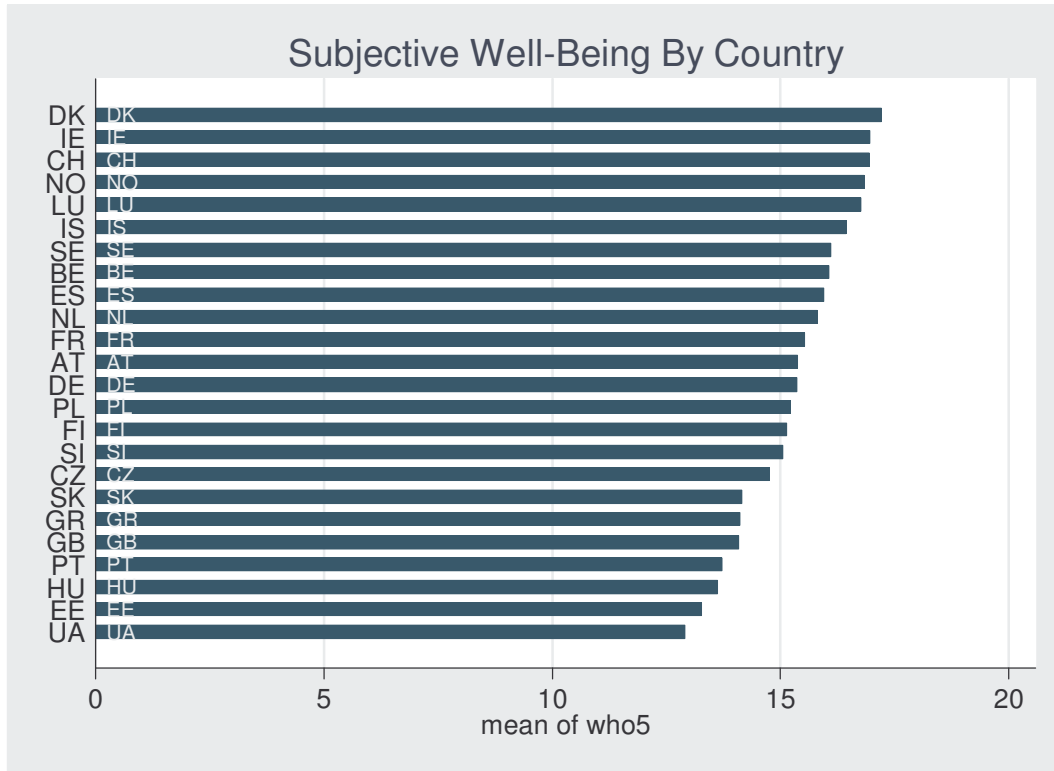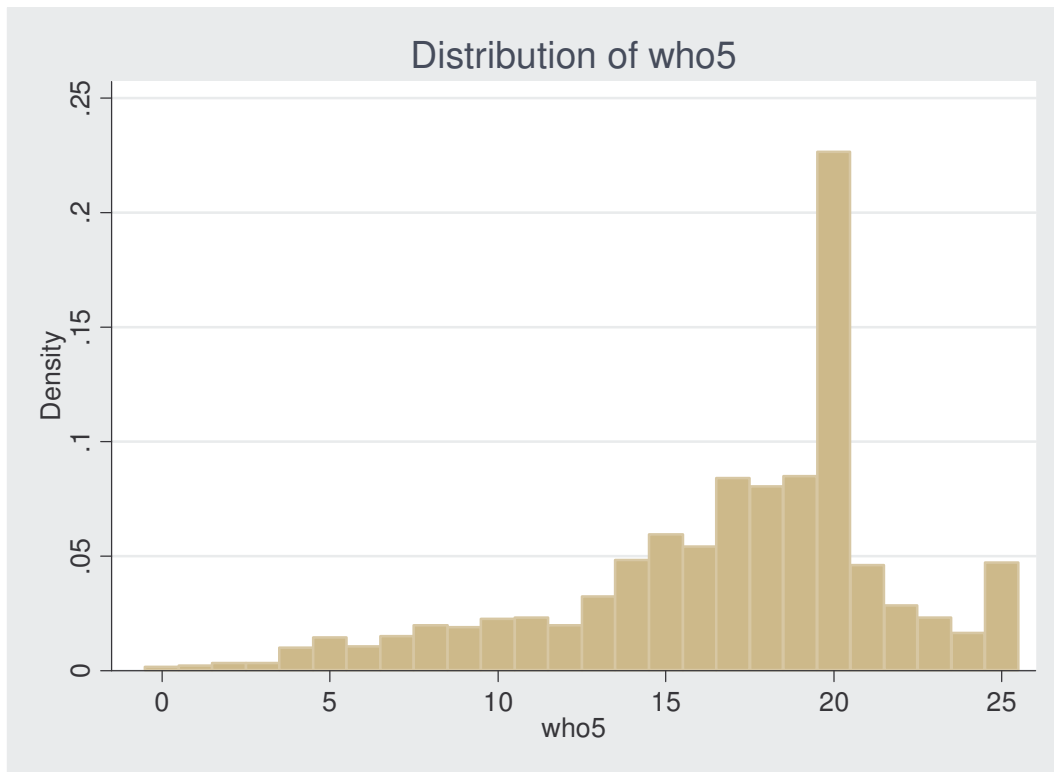
Figure 1

Subjective Well-Being By Country

Figure 2

Distribution of who5

Table 1 Description of Covariates

	Covariate	Description
Demographics	**Total net household income**	A categorical variable with 12 bands. Includes income from all sources within the household.
	Years of full-time education	The total number of years spent in full-time education.
	Marital status	Categorical variable indicating whether the respondent is 1. Married, 2. Separated, 3. Divorced, 4. Widowed and 5. Never married. Married is the base category.
	Has children	Binary variable indicating whether the respondent has children (1) or not (0).
Social Capital	**Time spent watching the television**	The number of hours the respondent watches television on an average weekday. Measured on a 7-point scale from *'no time at all'* to *'more than 3 hours'*.
	Aggregate trust scale	It is the sum of three individual trust questions capturing whether the respondent believes that *'most people can be trusted'*, *'that most people would try to take advantage of you if they got the chance'* and *'that most of the time people try to be helpful'*. Each question is measured on a scale of 0-10. The aggregate scale ranges from 0-30, with higher values indicating greater levels of trust.
	Weekly socialising	How often the respondent meets socially with friends, relatives or work colleagues. Measured on a 7-point scale ranging from *'never'* to *'every day'*.
	Comparative weekly socialising	How often the respondent takes part in social activities compared to other people their age. Measured on a 7-point scale ranging from *'never'* to *'every day'*.
	Discuss intimate/personal matters	Indicates whether the respondent has someone to talk to about intimate or personal matters. Binary variable equally 1 if the respondent has someone to talk to and 0 otherwise.
	Aggregate religion scale	It is a sum of three individual religious questions. The first asks respondents how religious they are on a scale of 0-10, where 0 equals *'not at all religious'* and 10 equals *'very religious'*. The second captures how often the respondent attends religious services. The third asks respondent how often they pray apart from when they are at religious services. Both the second and third questions are measured on a 7-point scale ranging from *'never'* (0) to *'every day'* (7). These three questions were combined to create an aggregate religion scale ranging from 0 to 22, with higher values indicting more religious activities.
Health Capital	**Bad health**	A self-rated measure of general health, originally was measured on a 5-point scale (very good, good, fair, bad and very bad). This was transformed into a binary variable equalling 1 if the respondents reported fair, bad or very bad health and 0 otherwise.
Labour Market	**Total hours worked per week**	The number of hours the respondent normally works per week including any paid or unpaid overtime.
	Aggregate control over work scale	It is the sum of three work control questions. Each question is measured on a scale of 0-10 where 0 equals *'I have no influence'* and 10 equals *'I have complete control'* and asks respondents about how much the management at work allows you to 1. *'decide how your own daily work is organised'*, 2. *'influence policy decisions about the activities of your organisation'* and 3. *'choose or change your pace of work?'*. These three scales were combined to create an aggregate scale ranging from 0-30, with higher values indicting more control over work.
	Contract type	A categorical variable indicating whether the respondent has a work contract of 1. Unlimited duration, 2. Limited duration, or 3. No contract. 0= Not working (omitted category).

Table 2 Determinants of Well-Being in Ireland: OLS Models

	1	2	3	4	5
Total net household income	0.178**	0.160**	0.063	0.119	0.041
	(0.070)	(0.074)	(0.073)	(0.077)	(0.075)
Missing income dummy	0.937	0.643	-0.157	0.391	-0.291
	(0.604)	(0.650)	(0.639)	(0.658)	(0.643)
Years of full-time education	0.102**	0.087**	0.031	0.074	0.029
	(0.041)	(0.044)	(0.043)	(0.045)	(0.044)
Age	~	0.007	0.007	0.011	0.010
		(0.010)	(0.011)	(0.011)	(0.011)
Female	~	-0.254	-0.572**	-0.134	-0.527*
		(0.250)	(0.253)	(0.263)	(0.269)
Separated	~	-2.681***	-2.017***	-2.810***	-2.086***
		(0.770)	(0.777)	(0.773)	(0.783)
Divorced	~	-0.050	0.846	0.119	0.930
		(1.920)	(2.240)	(1.916)	(2.222)
Widowed	~	-0.248	-0.062	-0.182	-0.001
		(0.550)	(0.549)	(0.552)	(0.551)
Never married	~	-0.209	0.138	-0.091	0.183
		(0.435)	(0.416)	(0.436)	(0.417)
Has children	~	-1.106***	-1.022***	-1.102***	-1.011***
		(0.382)	(0.356)	(0.383)	(0.357)
Total time spent watching TV per weekday	~	~	-0.053	~	-0.042
			(0.065)		(0.066)
Aggregate trust scale	~	~	0.067***	~	0.067***
			(0.023)		(0.024)
Weekly socializing	~	~	0.167*	~	0.176*
			(0.100)		(0.101)
Comparative weekly socialising	~	~	0.438**	~	0.427**
			(0.172)		(0.172)
Discuss intimate/personal matters with someone	~	~	-2.117***	~	-2.099***
			(0.476)		(0.477)
Aggregate religion scale	~	~	0.137***	~	0.138***
			(0.029)		(0.029)
Bad health	~	~	-2.752***	~	-2.705***
			(0.395)		(0.397)
Total hours worked per week	~	~	~	-0.005	-0.006
				(0.014)	(0.014)
Control over work scale	~	~	~	0.015	0.001
				(0.021)	(0.021)
Unlimited duration contract	~	~	~	0.151	0.228
				(0.402)	(0.403)
Limited duration contract	~	~	~	0.555	0.432
				(0.578)	(0.584)
No contract	~	~	~	0.217	0.422
				(0.474)	(0.498)
Constant	14.514***	15.821***	15.503***	16.056***	15.630***
	(0.610)	(1.171)	(1.437)	(1.389)	(1.606)
R-squared	0.01	0.03	0.14	0.03	0.14
Observations	2147	2100	1956	2100	1956

Notes: OLS coefficients reported with standard errors in parenthesis. Dummy variables for missing hours, control over work scale and contract type data are also included as covariates. Significance levels: *** 1%, ** 5%, * 10%

Table 3 Determinants of being vulnerable to depression in Ireland: Probit Models

	1	2	3	4	5
Total net household income	-0.014***	-0.013**	-0.006	-0.009	-0.004
	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)
Missing income dummy	-0.062*	-0.052	0.003	-0.029	0.017
	(0.036)	(0.040)	(0.046)	(0.043)	(0.047)
Years of full-time education	-0.008**	-0.008**	-0.004	-0.007**	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Age	~	0.000	-0.001	-0.001	-0.001
		(0.001)	(0.001)	(0.001)	(0.001)
Female	~	0.014	0.031	-0.001	0.022
		(0.019)	(0.020)	(0.020)	(0.021)
Separated	~	0.133**	0.087	0.154**	0.098
		(0.064)	(0.061)	(0.067)	(0.064)
Divorced	~	-0.011	-0.021	-0.017	-0.023
		(0.104)	(0.101)	(0.101)	(0.097)
Widowed	~	0.023	0.004	0.021	0.001
		(0.036)	(0.036)	(0.035)	(0.035)
Never married	~	0.030	0.006	0.021	0.003
		(0.037)	(0.035)	(0.036)	(0.034)
Has children	~	0.062**	0.064**	0.059**	0.060**
		(0.029)	(0.028)	(0.028)	(0.027)
Total time spent watching TV per weekday	~	~	0.005	~	0.004
			(0.005)		(0.005)
Aggregate trust scale	~	~	-0.003*	~	-0.003**
			(0.002)		(0.002)
Weekly socializing	~	~	-0.009	~	-0.010
			(0.007)		(0.007)
Comparative weekly socialising	~	~	-0.027**	~	-0.025*
			(0.013)		(0.013)
Discuss intimate/personal matters with someone	~	~	0.121***	~	0.119***
			(0.028)		(0.028)
Aggregate religion scale	~	~	-0.007***	~	-0.007***
			(0.002)		(0.002)
Bad health	~	~	0.166***	~	0.163***
			(0.034)		(0.034)
Total hours worked per week	~	~	~	-0.001	-0.001
				(0.001)	(0.001)
Control over work scale	~	~	~	0.002	0.003
				(0.002)	(0.002)
Unlimited duration contract	~	~	~	-0.009	0.013
				(0.033)	(0.046)
Limited duration contract	~	~	~	-0.024	-0.004
				(0.045)	(0.050)
No contract	~	~	~	-0.013	0.026
				(0.036)	(0.052)
Observations	2147	2100	1956	2100	1956

Notes: Estimated using probit. Marginal effects and standard errors (in parenthesis) reported. Dummy variables for missing hours, control over work scale and contract type data are also included as covariates. Significance levels: *** 1%, ** 5%, * 10%