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Antidepressant use in 27 European countries: associations with socio-demographic, cultural and economic factors

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Abstract

Background. Prescribing of antidepressants varies widely between European countries despite no evidence of difference in the prevalence of affective disorders.

Aims. To investigate associations between use of antidepressants, country-level spending on healthcare and attitudes towards mental health problems.

Method. We used Eurobarometer 2010, a large general population survey from 27 European countries, to measure antidepressant use and regularity of use. We analysed associations with country-level spending on healthcare and country-level attitudes towards mental health problems.

Results. Higher country spending on healthcare was strongly associated with regular use of antidepressants. Beliefs that mentally ill people are 'dangerous' were associated with higher use, and beliefs that they 'never recover' or 'have themselves to blame' with lower use and less regular use of antidepressants.

Conclusions. Contextual factors such as healthcare spending and public attitudes towards mental illness may partly explain variations in antidepressant use and regular use of these medications.

Declaration of interest. None

Background

Prescribing of antidepressants in Europe increased by an average of 20% per year between 2000 and 2010.¹ However, the quantity of antidepressant prescribing varies widely between countries, with 6.4 times as many antidepressants prescribed per person in Iceland than Estonia in 2010.² A large body of research into the epidemiology of depression and anxiety disorders shows higher prevalence among women, individuals in late middle age and those of lower socio-economic status,^{3,4} but no substantial difference between European countries.⁵ Little is known about reasons for the inter-country variation in antidepressant use. Variations in treatment seeking, availability of providers, spending on healthcare services and other differences between healthcare systems are likely important factors. Social attitudes towards mental illness may also play a role, as is the case for help-seeking for mental health problems.^{6,7} In this study, we investigated individual and country level factors associated with: (i) any antidepressant use and (ii) regularity of antidepressant use among those who reported antidepressant use, as a quality indicator for treatment regimens. Regularity is important because clinical guidelines recommend that antidepressants be taken regularly for a minimum period of a few months,⁸ and adherence has been shown to be low in community settings.⁹ We hypothesized that antidepressant use patterns would reflect sociodemographic characteristics associated with affective disorders, and that higher levels of healthcare spending and lower levels of mental health related stigma in each country would be associated with higher levels of antidepressant use and greater regularity.

Methods

Data Source

The key data source was Eurobarometer 2010. This is a cross-sectional survey of residents of 27 EU member states, with approximately 1,000 individuals from each

country interviewed. Participants were recruited via multistage random probability sampling and were representative of residents of each country aged 15 years or older. Data were collected via face-to-face interviews (n=26,800). Full details of the design and sampling are given elsewhere.^{10,11}

As this study was based on fully anonymised publicly available data, ethical approval was not needed.

Dependent variables

Two dichotomous dependent variables derived from Eurobarometer 2010 were examined:

Any use of antidepressants in the past 12 months. Participants were asked: 'Have you taken any antidepressants in the last 12 months?' Responses were (1) 'Yes, regularly for a period of at least 4 weeks'; (2) 'Yes, regularly for a period of less than 4 weeks'; (3) 'Yes, from time to time when I felt the need'; and (4) 'No, not at all.' These responses were combined into 'any use' vs. 'no use'.

Regularity of use among antidepressant users. The first two responses from the above question were combined into an indicator variable for regular use vs. non-regular use.

Independent variables

Individual-level variables were taken from Eurobarometer 2010. The sources of country-level variables were taken from various sources and these are described below.

Socio-demographic information included age (grouped into 15-39, 40-54 and 55+ years), sex and employment status. To assess employment status, participants were asked, 'what is your current occupation?' Students and employed participants were

categorised as 'employed'. Participants looking after the home, ill or retired were categorised as 'economically inactive' and the remainder were rated as unemployed. Self-perceived social class was assessed by asking the participants to place themselves on a ladder, step '1' of which corresponded to the lowest level in society and step '10' to the highest. Individuals placing themselves on levels 1-4 were categorised as 'low', 5-6 as 'medium' and 7-10 as 'high'. 3.1% of individuals refused to answer this question. Data for these individuals were imputed from their occupation and whether they had difficulty paying bills.

Mental health symptoms were assessed using the Mental Health Inventory (MHI-5). The MHI-5 is a valid and reliable measure of common mental disorders derived from the Short Form 36 (SF-36).^{12,13} Higher scores indicate worse mental health. As a validated cut-point has not been established for this scale,¹⁴ individuals were categorised into three groups: those with the worst mental health, scoring in the top 5% on MHI-5; those with poorer than average mental health, scoring above the median score but excluding the top 5%; and those with better than average mental health, scoring lower than the median value. 1.3% of individuals answered 'don't know' to some MHI-5 items. In these cases, the mean score from other items was used. 0.2% of individuals answered 'don't know' to all MHI-5 items and their scores were imputed from their sex and occupation.

Individual attitudes towards people with mental health problems. Attitudes of individual Eurobarometer 2010 participants were assessed by the question, 'which of the following two statements best describe how you feel?': (1) 'you would find it difficult talking to someone with a significant mental health problem?', (2) 'you would have no problem talking to someone with a significant mental health problem?', (3) 'don't know'. Participants who gave options (2) and (3) were grouped together.

Difficulty paying bills was used as an indicator of financial difficulties. Participants were asked: 'during the last twelve months, would you say you had difficulties to pay

your bills at the end of the month'. The responses 'from time to time' and 'most of the time' were grouped as indicating difficulty, and 'never' and 'refusal' were grouped as no difficulty.

Country-level health care spending. World Bank data provided annual health care spending per capita in US\$ in 2010, which ranged from \$457 in Romania to \$8,193 in Luxembourg.¹⁵ The 27 European countries are distributed across this range, and were therefore assigned to four equally sized groups: those spending \$457-\$1,002, \$1,402-\$2,872, \$2,895-\$4,618 and \$4,658-\$8,193 per capita.

Country prevalence of stigmatising attitudes towards people with mental health problems was assessed in Eurobarometer 2006 using four questions about various stigmatizing beliefs: people with psychological or emotional health problems: (1) constitute a danger to others; (2) are unpredictable; (3) have themselves to blame; and (4) never recover. Participants rated their agreement on a 4-point Likert scale from 'totally disagree' to 'totally agree'. Those responding 'totally agree' or 'tend to agree' were grouped together as endorsing the statement. The country-level measures were computed as the proportion of respondents endorsing each statement in each country. Each country-level attitude variable was standardised and a z-score was computed as an indicator of how far away (in standard deviations) the country prevalence was from the mean prevalence.

Statistical analysis

Separate multivariable logistic regression models were used to examine predictors of the two outcome variables—any use of antidepressants and regularity of use. The model for any use of antidepressants included the full sample (n=26,800), and the model for regular use was limited to those who reported any use (n=1,995).

Eurobarometer 2010 post-stratification weights, based on sex, age, region and size of locality, were used in all analyses to estimate the country-level averages. All analyses were carried out using R version 3.0.3.

Results

Prevalence of antidepressant use

7.2% (n=1,995) of adults reported taking antidepressants at some time in the past year. There was wide variation between countries in prevalence of antidepressant use, from 15.7% in Portugal to 2.7% in Greece (figure 1). Overall prevalence of antidepressant use by sociodemographic and mental health related characteristics are presented in table 1.

Table 1 here

Figure 1 here

Characteristics associated with antidepressant use

The multivariable regression results presented in Table 2 show that individuals had higher odds of taking antidepressants if they: had higher MHI-5 scores, were female, were aged over 40 years old, were not employed or looking after the home (compared to those employed or studying), perceived themselves to be of lower social class and reported difficulty paying bills. Comfort with talking to someone with

a mental health problem was not associated with the odds of taking antidepressants. Individuals had higher odds of taking antidepressants if they lived in a country that spent more on healthcare (but the relationship did not show a clear gradient and unadjusted odds ratios were not statistically significant – see online appendix), lived in a country where residents were more likely to consider people with mental illness to be dangerous, or a country where residents were less likely to consider people with mental illness to never recover or to have themselves to blame for their illness.

Table 2 here

Characteristics associated with regularity of antidepressant use

58% of antidepressant users reported regular use of antidepressants. There was wide variation between countries, from 89% in Sweden to 19% in Bulgaria (figure 2).

The multivariable regression results show that individuals who reported taking antidepressants had higher odds of taking them regularly if they had a higher MHI-5 score, were more comfortable talking to someone with a mental health problem and were younger (table 2). There were no significant associations with sex, employment status, perceived social class or difficulty paying bills. At the country level, individuals had higher odds of taking antidepressants regularly if they resided in a country that spent more on health care per capita, where residents were more likely to consider people with mental illness to be unpredictable, and where residents were less likely to consider people with mental illness to never recover. At a country level, there was no statistically significant correlation between prevalence of antidepressant use and the proportion of antidepressant users reporting regular use ($r = 0.15$, $p = 0.44$).

Figure 2 here

Discussion

This study provides new insights into how societal attitudes and spending on healthcare are associated with antidepressant use. These findings explain some of the variation in antidepressant use across Europe and provide further evidence for the relationship between stigma and treatment for mental illness. The findings also contribute substantively to the study of the epidemiology of antidepressant use in Europe, which to date provides limited insight into the socio-demographic and contextual correlates of variations across countries.

The 12-month prevalence of antidepressant use of 7.2% in 2010 is double a previous estimate of 3.7% in 2000,¹⁶ which reflects a doubling in prescription rates over the same period in 18 European countries.² The demographic associations with antidepressant use in Europe have not been investigated in detail in previous research. One study in Europe¹⁷ showed that women and those in middle age are more likely to use antidepressants, which is consistent with our findings. Our findings are also broadly consistent with studies from the US, which show that older people, women and people with worse mental health are more likely to take antidepressants.^{18–20}

The socio-demographic characteristics associated with antidepressant use in this study were similar to those typically found to be associated with affective disorders in community surveys.^{3,5} At the country level, health spending and stigmatising attitudes were associated with antidepressant use to some extent. Interestingly, different aspects of stigma had opposite effects on likelihood of taking antidepressants.

The prevalence of regular use of antidepressants is low in view of practice guideline recommendations that they should be taken regularly for effective treatment, with only 58% of the participants reporting that they take them regularly. This is also consistent with existing research, which shows low adherence to antidepressant regimens. An international review of studies showed a median adherence rate of only

40%.⁹ Low adherence may be due to prescriber factors. For example, in a study of prescribing between 1992 and 1997 in the UK,²¹ only 33% of SSRI prescriptions were consistent with guidelines. Patients' concerns about dependence, toxicity and stigma may also contribute to the low rate of regular use.²² Finally, patients may discontinue antidepressants early because they start to feel better.

The results regarding regularity of use within demographic groups are relevant to clinical practice. In particular, we found that middle-aged and older adults are less likely to take antidepressants regularly. Clinicians may thus want to pay greater attention to monitoring medication use in this age group.

One of the most striking results from this study was the strong association of healthcare spending with regular use of antidepressants. A possible explanation is that physicians in better-funded health care systems have more time, training and support and make more accurate diagnoses and prescribe more effective drug regimens. Alternatively, better-funded health care systems may provide more guidance to patients on use of drugs or make drugs more affordable. A study in Australia found that an increase in co-payments (transferring some of the cost of drugs to patients) reduced dispensing.²³

We found no correlation at a country level between prevalence of antidepressant use and the proportion of antidepressant users reporting regular use. We might have expected countries with higher prevalence to have more people with less severe symptoms taking antidepressants, and therefore lower regularity of use. However, this did not appear to be the case. Regularity of use appears low in Eastern European countries and high in Scandinavian countries. As these countries tend to have lower and higher per capital income respectively, it is difficult to tease out the contribution of economic factors and regional cultural factors. We included proxies for both of these variables in our analyses and this suggests that economic and cultural

factors may independently contribute to the likelihood of individuals taking antidepressants regularly.

The results relating to stigmatising attitudes are complex and merit some discussion. It is clear that individual and country level attitudes play an important role in whether and how people use antidepressants. At an individual level, comfort talking to someone with a mental health problem does not appear to make people more or less likely to use antidepressants, but does appear to make people less likely to use these medications regularly.

As has been shown previously, different types of social stigma vary in their association with outcomes for people with mental illness.⁶ The findings from our study suggest that individuals living in a country where a higher proportion of the public believes that people with mental illnesses are 'dangerous' is associated with a greater likelihood of using antidepressants. Other research has shown that a belief that people with mental illnesses are dangerous is associated with greater likelihood of help-seeking,⁷ more support for coercive treatment^{24,25} and a biogenetic explanation for mental illness.²⁶ It may be that a 'medicalised' concept of mental illness in which mental illness is considered 'a disease like any other',²⁷ which can be treated with effective medical therapy, contributes to greater use of medical treatments such as antidepressants. Conversely, living in a country with stronger beliefs that people with mental illness 'have themselves to blame' or 'never recover' was associated with a lower likelihood of using antidepressants and lower regularity of use. The view that people with mental illnesses 'never recover' has particularly strong and significant inverse associations with antidepressant use and regular use. Viewing mental illness as a personality fault or an incurable illness may contribute to lower likelihood of use of medical therapies. Other research has also shown that attitudes regarding blame are associated with lower rates of willingness to seek help and are often inversely associated with endorsement of a biogenetic model. These

results support the idea that medicalised views of mental illness may act as a ‘double edged sword’, leading to higher rates of treatment but also greater social distance²⁷⁻²⁹ and social exclusion, for example from employment.³⁰

Strengths and limitations

This study was based on a large and representative sample and included both individual and contextual variables from 27 diverse European countries, providing powerful models. Nevertheless, the study had a number of limitations. First, Eurobarometer is a cross-sectional survey, thus limiting causal inference. Second, many of the variables used are based on self-report and may be vulnerable to recall bias. It was not possible to verify antidepressant use with medical records; however, past research has shown good agreement between self-reports of medication use and pharmacy records and low risk of bias.^{31,32} Third, mental health status was determined via a brief self-report measure and not verified by a clinician. Furthermore, specific mood and anxiety disorders could not be assessed based on these data. However, mean MHI-5 scores were highest for women and people aged 40-54, which corresponds with patterns of common mental disorders and supports validity of the data. Additionally, some of the effect sizes are small and thus, we have tried to emphasise the magnitude of the association in addition to statistical significance given the relatively large sample size. Finally, the data are based on European countries only, which have specific health care systems and attitudes towards mental health and medications, and therefore the results may not be generalisable to other regions.

Conclusions

In the context of these limitations, these findings provide a broad view of both individual and sociocultural correlates of antidepressant use. Some of the wide variation in antidepressant use across Europe is explained by differences in

healthcare spending and attitudes towards mental illness. Healthcare spending in this study is likely a proxy for many variables, including availability of medical care, training of healthcare staff and affordability of drugs. Our study shows that healthcare spending is strongly associated with regularity of antidepressant use. In addition, attitudes towards people with mental illness are associated with both use and regularity of use. Policy aiming to achieve appropriate prescribing and use of antidepressants will need to consider individual and social attitudes as well as medical practices. Variations in the association of various attitudinal factors with antidepressant use points to the need for a more nuanced approach to messages incorporated in public mental health campaigns. The view that people with mental illness cannot recover or are blame-worthy for their illness appear to be strong barriers to appropriate and regular use of antidepressants. Countering these beliefs through public health campaigns and interventions may thus help to improve access to and more appropriate use of antidepressant medications.

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Table 1: Prevalence of antidepressant use and regular antidepressant use among those who use antidepressants, showing 95% confidence intervals

		Any use of antidepressants in the last 12 months (general population) Percent	Taking regularly (antidepressant users only) Percent
MHI-5	5-10	2.0 (1.7-2.2)	60.5 (54.1-66.6)
	11-17	9.5 (9.0-10.0)	54.5 (51.6-57.3)
	18+	34.6 (32.1-37.2)	66.8 (62.4-71.0)
Comfortable talking to someone with a mental health problem	Yes	6.9 (6.5-7.3)	63.3 (60.5-66.1)
	No	7.9 (7.3-8.4)	49.7 (46.0-53.4)
Sex	Female	9.4 (8.9-9.9)	58.2 (55.5-60.9)
	Male	4.9 (4.5-5.3)	58.1 (54.0-62.1)
Age	15-39	4.5 (4.1-5.0)	64.8 (60.2-69.3)
	40-54	8.6 (8.0-9.3)	60.8 (56.7-64.8)
	55+	9.5 (8.9-10.1)	52.3 (49.1-55.6)
Employment status	Employed	4.5 (4.2-4.9)	61.0 (57.2-64.7)
	Economically inactive	11.0 (10.4-11.7)	55.6 (52.5-58.7)
	Unemployed	10.4 (9.2-11.7)	60.2 (53.6-66.5)
Self-perceived social class	Low	12.4 (11.6-13.3)	56.0 (52.2-59.7)
	Medium	6.5 (6.1-7.0)	58.7 (55.2-62.0)
	High	4.8 (4.3-5.3)	62.1 (56.9-67.2)
Difficulty paying bills	No	5.1 (4.8-5.5)	62.6 (59.2-65.8)
	Yes	10.6 (10.0-11.2)	54.7 (51.7-57.7)

Figure 1: Percentage of general population that have used antidepressants in the past 12 months by country, with 95% confidence intervals (note maximum value of 15.7%)

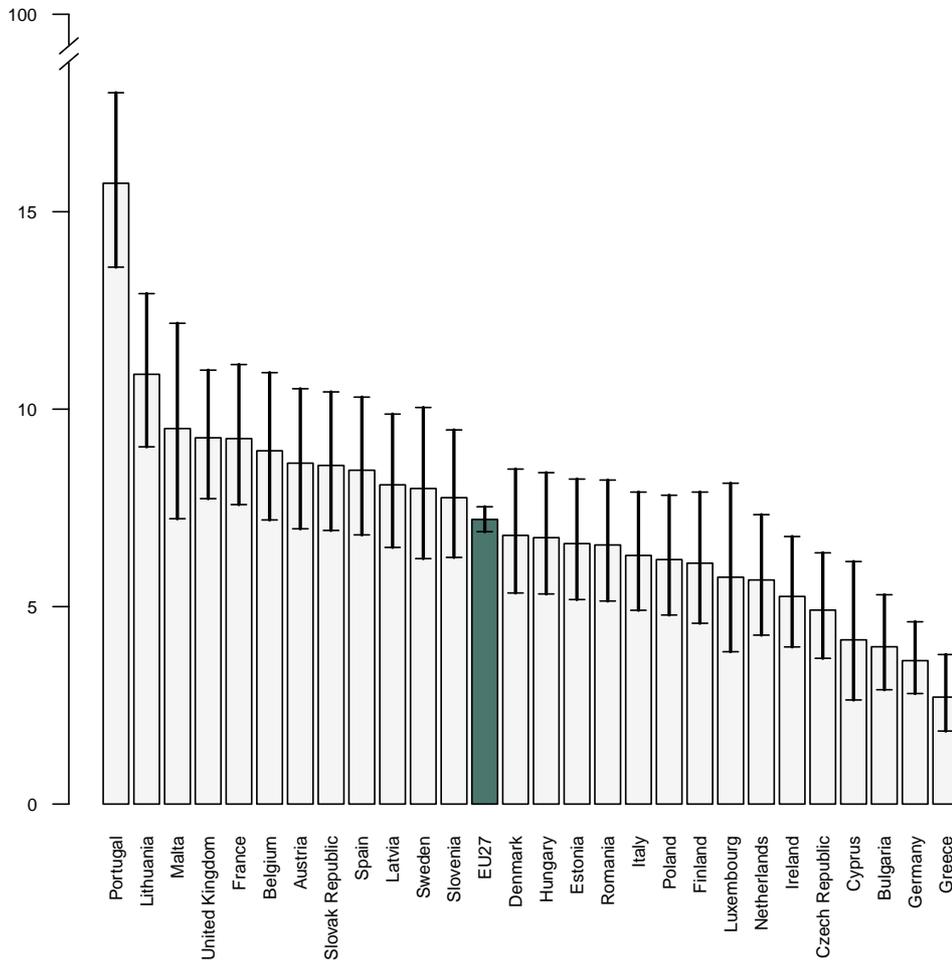


Figure 2: Percentage of antidepressant users that report taking them regularly by country, with 95% confidence intervals

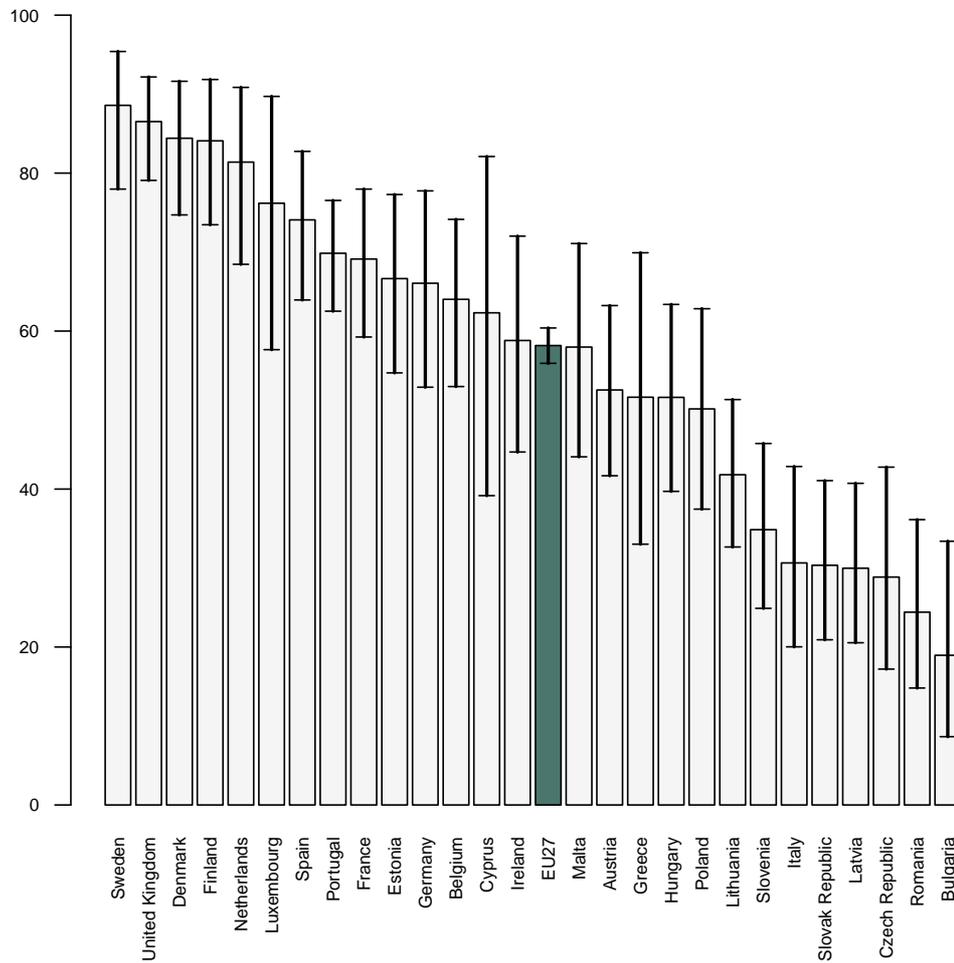


Table 2: Result of the multivariable logistic regression models for predictors of antidepressant use in Eurobarometer 2010.

		Any use of antidepressants in last 12 mths (Sample = 26,800; users = 1,995) AOR (95% CI)	Taking regularly (Sample = 1,995; regular users = 1,154) AOR (95% CI)
Individual level variables	<i>MHI-5 (ref = 5-10)</i>		
	11-17	4.77 (4.11-5.52)***	1.14 (0.83-1.57)
	18+	19.43 (16.11-23.43)***	2.51 (1.72-3.66)***
	Uncomfortable talking to someone with a mental health problem	0.98 (0.88-1.09)	0.71 (0.58-0.88)***
	Male sex	0.62 (0.55-0.69)***	0.93 (0.75-1.16)
	<i>Age (ref = 15-39)</i>		
	40-54	1.69 (1.47-1.94)***	0.74 (0.56-0.99)*
	55+	1.45 (1.24-1.71)***	0.58 (0.42-0.78)***
	<i>Labour status (ref = employed)</i>		
	Economically inactive	1.76 (1.51-2.04)***	1.10 (0.85-1.43)
	Unemployed	1.53 (1.28-1.83)***	0.92 (0.65-1.30)
	<i>Perceived SES (ref = low)</i>		
	Mid	0.75 (0.66-0.85)***	0.88 (0.70-1.11)
	High	0.71 (0.60-0.84)***	0.85 (0.62-1.16)
Difficulty paying bills	1.44 (1.28-1.62)***	0.84 (0.67-1.05)	
Country level variables	<i>Health spend pc (ref = <\$1000)</i>		
	\$1000 - \$2999	1.58 (1.35-1.87)***	1.48 (1.06-2.06)*
	\$3000 - \$4499	1.77 (1.47-2.13)***	2.34 (1.62-3.37)***
	\$4500+	1.79 (1.45-2.20)***	4.75 (3.01-7.48)***
	<i>Stigmatising attitudes: z-score of % agreeing that mentally ill people:</i>		
	'Are unpredictable'	1.06 (0.97-1.15)	1.27 (1.06-1.53)*
	'Are dangerous'	1.27 (1.16-1.38)***	1.15 (0.96-1.38)
'Never recover'	0.87 (0.79-0.95)***	0.56 (0.46-0.69)***	
'Have selves to blame'	0.79 (0.71-0.87)***	0.81 (0.66-1.01).	

AOR = Adjusted odds ratio; CI=confidence interval

*** p <0.001, ** p <0.01, * p < 0.05, . p < 0.1

Online Appendix: Result of logistic regression models for predictors of antidepressant use in Eurobarometer 2010.

		General population (sample = 26,800) Any use of antidepressants in last 12 mths (users = 1,995)		AD users (sample = 1,995) Taking regularly (regular users = 1,154)	
		UOR (95% CI)	AOR (95% CI)	UOR (95% CI)	AOR (95% CI)
Individual level variables	<i>MHI-5 (ref = 5-10)</i>				
	11-17	5.19 (4.50-5.99)***	4.77 (4.11-5.52)***	0.78 (0.59-1.04).	1.14 (0.83-1.57)
	18+	26.31 (22.15-31.25)***	19.43 (16.11-23.43)***	1.31 (0.95-1.82)	2.51 (1.72-3.66)***
	Uncomfortable talking to someone with a mental health problem	1.16 (1.05-1.28)***	0.98 (0.88-1.09)	0.57 (0.47-0.69)***	0.71 (0.58-0.88)***
	Male sex	0.49 (0.44-0.55)***	0.62 (0.55-0.69)***	1.00 (0.82-1.22)	0.93 (0.75-1.16)
	<i>Age (ref = 15-39)</i>				
	40-54	2.00 (1.75-2.28)***	1.69 (1.47-1.94)***	0.84 (0.65-1.09)	0.74 (0.56-0.99)*
	55+	2.22 (1.97-2.50)***	1.45 (1.24-1.71)***	0.59 (0.47-0.75)***	0.58 (0.42-0.78)***
	<i>Labour status (ref = employed)</i>				
	Economically inactive	2.60 (2.34-2.88)***	1.76 (1.51-2.04)***	0.80 (0.66-0.98)*	1.10 (0.85-1.43)
	Unemployed	2.44 (2.08-2.86)***	1.53 (1.28-1.83)***	0.97 (0.71-1.32)	0.92 (0.65-1.30)
	<i>Perceived SES (ref = low)</i>				
	Mid	0.48 (0.43-0.54)***	0.75 (0.66-0.85)***	1.10 (0.90-1.35)	0.88 (0.70-1.11)
High	0.35 (0.30-0.40)***	0.71 (0.60-0.84)***	1.29 (0.99-1.68).	0.85 (0.62-1.16)	
Difficulty paying bills	2.19 (1.99-2.41)***	1.44 (1.28-1.62)***	0.72 (0.60-0.87)***	0.84 (0.67-1.05)	
Country level variables	<i>Health spend pc (ref = <\$1000)</i>				
	\$1000 - \$2999	1.12 (0.98-1.27).	1.58 (1.35-1.87)***	1.40 (1.09-1.81)*	1.48 (1.06-2.06)*
	\$3000 - \$4499	1.11 (0.98-1.26)	1.77 (1.47-2.13)***	3.15 (2.44-4.07)***	2.34 (1.62-3.37)***
	\$4500+	0.88 (0.76-1.01).	1.79 (1.45-2.20)***	4.05 (3.00-5.47)***	4.75 (3.01-7.48)***
	<i>Stigmatising attitudes: z-score of % agreeing that mentally ill people:</i>				
	'Are unpredictable'	1.06 (1.02-1.11)*	1.06 (0.97-1.15)	0.81 (0.73-0.89)***	1.27 (1.06-1.53)*
	'Are dangerous'	1.06 (1.01-1.11)*	1.27 (1.16-1.38)***	0.75 (0.69-0.82)***	1.15 (0.96-1.38)
	'Never recover'	0.94 (0.89-0.99)*	0.87 (0.79-0.95)***	0.49 (0.44-0.56)***	0.56 (0.46-0.69)***
'Have selves to blame'	0.94 (0.90-1.00)*	0.79 (0.71-0.87)***	0.55 (0.49-0.61)***	0.81 (0.66-1.01).	

*** p < 0.001, ** p < 0.01, * p < 0.05, . p < 0.1

UOR = Unadjusted odds ratio; AOR = Adjusted odds ratio, CI=confidence interval