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## 34 Does social participation decrease depressive symptoms in old age?

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- ▶ Participation in social activity predicts decline in depressive symptoms over time
  - ▶ Engaging in religious and church activity reduces depressive symptoms the most
  - ▶ Voluntary and charity work do not seem to affect a change in depressive symptoms
  - ▶ Policies that enhance social participation may prevent late life depression
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### 34.1 Social participation and depressive symptoms in old age

Late life depression is one of the most common mental health problems affecting older individuals. A study comparing ten Western European countries reported that the prevalence of depressive symptoms of clinical significance ranges from 18 per cent in Denmark to 36 per cent in Spain in persons aged 50 years and older (Castro-Costa et al. 2007). According to projections by the World Health Organization (WHO), depression will be the leading cause of Disability Adjusted Life Years (DALYs) lost in high income countries in 2030 (Mathers & Loncar 2006). Research suggests that a range of late-life events and experiences faced by older individuals have an impact on depression including the onset of a medical condition or disability, the loss of a family member, friend, work or social status, and the general loss of independence and control. In addition, a decrease in social interactions and social participation, elements of active ageing, is a leading risk factor of depressive symptoms in old age. An extensive body of research suggests that higher participation in religious or church activities, clubs, political groups, and volunteering, are all predictive of reduced depressive symptoms at old age (Abu-Rayya 2006, Sirven & Debrand 2008, Chiao et al. 2011, Baetz et al. 2012, Lou et al. 2012, Taylor et al. 2012). The causal mechanisms linking social participation and depressive symptoms, however, are not well understood. In addition, the social significance of different forms of social participation may be context-dependent, so that the mental health benefits of social participation may vary across countries.

Multiple causal mechanisms may explain the association between social participation and depressive symptoms. First, contact with others and engagement

in social or productive activities may provide a sense of purpose and meaning in life. Sharing interests, thoughts and difficult life events with others may stimulate individuals mentally and encourage them to remain connected to their family and community. Social engagement may thus decrease the risk of loneliness, a risk factor for depressive symptoms, and help older individuals to maintain high levels of life satisfaction. A second explanation is that reverse causation, or the impact of depressive symptoms on social participation, explains this association. That is, older individuals facing depressive symptoms may be less likely to engage in social activities. It has been suggested that both mechanisms may operate in a spiralling cycle: as older individuals engage in meaningful social activity and contact with others they accumulate positive experiences and are less likely to develop depressive symptoms. At the same time, having fewer depressive symptoms motivates one towards engaging in more social activities. A third explanation is that social engagement and depressive symptoms are not causally related, but share a common cause. For instance, the onset of a major chronic condition may lead to both depressive symptoms and reduced social engagement. In order to disentangle these three mechanisms, it is necessary to use longitudinal data to assess how changes in social participation may affect the development of depressive symptoms, and how these changes are independent from initial levels of depressive symptoms and confounding factors such as physical health.

Toward this end, we use the SHARE data to assess the link between different forms of social participation and depressive symptoms across ten countries. Our contribution is twofold. First, we implement an individual-fixed effect approach to assess whether individual changes in social interaction lead to changes in depressive symptoms. Individual fixed effects enable us to control for all time-invariant covariates that may bias the association between social participation and depressive symptoms. To assess the potential role of reverse causality, we control for individual levels of social participation and assess how changes in participation relate to changes in depressive symptoms.

Our second contribution is to examine whether the institutional context influences the way social participation relates to depressive symptoms. Most research examining the association between social participation and depressive symptoms has focused on a single population or has relied on cross-sectional data (Abu-Rayya 2006, Sirven & Debrand 2008, Chiao et al. 2011, Baetz et al. 2012, Lou et al. 2012, Taylor et al. 2012). We assess whether there are cross-national differences in how changes in social participation influence changes in older Europeans. We hypothesise that the association between social participation and the reduction of depressive symptoms is stronger in Northern and Western European countries where the role of families is weaker, and where formal participation in activities may be the most important source of social engagement at older ages. In turn, we

assume that respondents from Southern Europe, where family ties are stronger and opportunities to engage in volunteering or clubs is more limited, exhibit a weaker association between social participation and depressive symptoms.

## 34.2 Social participation and depression: measurement and analysis

Our study draws on data from the waves of SHARE collected in 2004/5, 2006/7, and 2010/11 (the data from 2008/9 did not include measures of social participation). We constructed a panel dataset that contained information on social participation, depression, and time-varying confounders for each wave. The analysis was limited to respondents who participated in all three waves and had valid weights for the balanced panel ( $N = 9,491$ ). Small differences in sample size occurred depending on the valid values for all the variables included in a given model.

Social participation was measured by asking individuals to report whether they had engaged in any of the following activities: 1) voluntary or charity work; 2) educational or training course; 3) sport, social or other kind of club activities; 4) religious organisations; and 5) political or community organisations. For each of these activities, participants were then asked to report the frequency of their participation in the last month (almost daily, almost every week, and less often). We used the information on social participation in Waves 1 and 2 to examine how changes in participation between these two waves related to changes in depressive symptoms over the short- and medium-term, as determined by Waves 1–2 and Waves 1–4, respectively.

Depressive symptoms were measured based on the Euro-Depression scale (EURO-D), an instrument designed to compare mental health symptoms across European countries (Prince et al. 1999). The EURO-D consists of twelve items: depression, pessimism, death wish, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment, and tearfulness. Each item is scored 0 (symptom not present) or 1 (symptom present), and item scores are summed (0–12). Previous studies have demonstrated validity for this measure against a variety of criteria for clinically significant depression, with an optimal cut-off point of 4 or above (Prince et al. 1999). We employed this cut-off point in the analysis.

SHARE includes a comprehensive set of potential confounding variables of the association between changes in social participation measures and depressive symptoms. We controlled for basic demographics, as well as for the following time-varying covariates updated at every wave: marital status, employment status, and limitations with activities of daily living.

### 34.2.1 Statistical analysis

We started by assessing mean and prevalence of depressive symptoms and social participation variables by country standardising by age and sex in each wave. To control for all time-invariant confounders, we then implemented fixed effect linear models that related changes in social participation between Waves 1 and 2 to changes in depressive symptoms between Waves 1 and 2 (short-term effect), as well as between Waves 1 and 4 (medium-term effect). We used these two specifications to assess whether the impact of changes in social participation is short-lived, or remains over a longer period of time, extending for four more years.

In order to measure change in social participation activities, we entered each of the variables in a model indicating for each wave whether respondents had engaged or not in each of the activities. Fixed effect estimates in models based on these variables can be interpreted as the impact of initiating a social activity on the depressive symptom scores. In separate models, we also constructed a score based on the sum of activities in which individuals engaged during the last month. Fixed effect estimates in this case can be interpreted as the impact of initiating a new activity on depressive symptom scores.

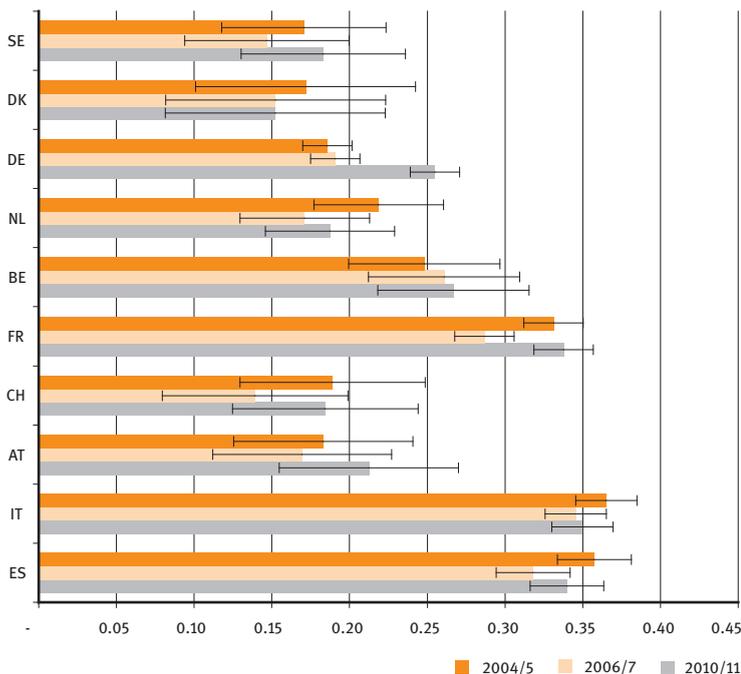
We began with analyses for all countries, incorporating country as a fixed effect term. Subsequently, we conducted separate analyses by country. In all analyses we used appropriate weights to account for the sampling design, non-response and attrition.

## 34.3 Variation in social participation and depression in old age

Social participation levels varied markedly across countries. On average, participation in sport, social and club activities was the most common form of social participation (23.7 percentage points), while participation in political or community organisation activities was the least common (4.7 percentage points). Social participation levels were generally higher in Denmark, Switzerland, Sweden and the Netherlands, and were typically lower in Spain and Italy. In general, at the population level, the proportion of citizens engaged in social participation remained stable over Waves 1 and 2, except for a large decrease in religious activities in Austria (18 percentage points) and large increases in sport, social and club activities (8 percentage points) in Denmark and Austria.

In Wave 4, some 30 per cent of the total SHARE sample was classified as experiencing depressive symptoms, but levels varied from 17 per cent in Denmark to 35

per cent in Italy, with patterns showing a North-South/East gradient (Figure 34.1). From Wave 1 to Wave 2, the prevalence of depression seemed to have declined in most countries, although the decrease in prevalence was only statistically significant in France. In five of the ten countries depressive symptoms occurred most frequently in Wave 4 compared to its prior waves.



**Figure 34.1:** Prevalence of depressive symptoms in ten European countries across three waves, 2004/5, 2006/7, 2010/11 (n=9,483)

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

## 34.4 Social participation as predictor of depressive symptoms

After adjusting for age, initiating a social activity predicted a decline in depressive symptoms in the short term (Table 34.1). However, when controlling for the socio-demographic and health related variables, the estimate of initiating social activities decreased by twelve per cent and did not reach con-

Table 34.1: Effect of a change in contemporaneous social participation on short term change in depressive symptom score, 2004/5 and 2006/7 (n=9,350)

	Model 1 estimate	SE	Model 2 estimate	SE	Model 3 Estimate	SE	Model 4 Estimate	SE
<i>Social participation</i>								
Score social participation	-0.059***	0.027	-0.052	0.027	-0.022	0.061	-0.026	0.060
Voluntary/charity					0.024	0.076	-0.009	0.075
Educational/training					-0.094	0.050	-0.066	0.049
Sport/social club					-0.138**	0.068	-0.154**	0.067
Religious/church					0.005	0.095	0.065	0.092
Political/community								
<i>Socio-demographics</i>								
Age	-0.037****	0.011	-0.070****	0.012	-0.036****	0.011	-0.070****	0.012
Household size			-0.069**	0.035			-0.071**	0.035
Separated/divorced/unmarried			-0.627**	0.284			-0.600**	0.285
Widowed			1.209****	0.183			1.22****	0.183
Unemployed			0.363****	0.106			0.365****	0.107
Retired			0.032	0.064			0.029	0.064
<i>Socio-economic</i>								
Log household income			-0.010	0.022			-0.008	0.022
Log household wealth			-0.065****	0.018			-0.064****	0.018
<i>Health related</i>								
Disabled			0.193	0.142			0.195	0.142
Number of IADL			0.359****	0.037			0.360****	0.037
Number ADL			0.016	0.043			0.015	0.043
Self-rated health			0.247****	0.024			0.247****	0.024
GALI limitations			-0.218****	0.032			-0.218****	0.032
Heart attack			0.194**	0.075			0.194**	0.075
Hypertension			0.131**	0.053			0.134**	0.053
Stroke			0.066	0.130			0.066	0.131
High blood sugar/diabetes			0.096	0.101			0.093	0.101
Chronic lung disease			0.096	0.094			0.097	0.094

Significance: \*\*=5%, \*\*\*=1%, \*\*\*\*=0.1%

Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

**Table 3A.2:** Effect of a change in lagged social participation on medium-term change in depressive symptom score (n=9,373)

	Model 1 estimate	SE	Model 2 estimate	SE	Model 3 Estimate	SE	Model 4 Estimate	SE
<i>Social participation</i>								
Score social participation	-0.059**	0.030	-0.036	0.029	-0.037	0.067	-0.009	0.066
Voluntary/charity					-0.016	0.083	-0.013	0.082
Educational/training					-0.087	0.055	-0.049	0.054
Sport/social club					-0.183**	0.074	-0.160**	0.075
Religious/church					0.158	0.104	0.149	0.102
Political/community								
<i>Sociodemographics</i>								
Age	0.035****	0.004	0.001	0.010	0.035****	0.004	0.002	0.010
Household size			-0.050	0.032			-0.049	0.032
Separated/divorced/unmarried			0.051	0.275			0.065	0.276
Widowed			0.384***	0.141			0.391***	0.141
Unemployed			0.236	0.121			0.239**	0.121
Retired			-0.023	0.054			-0.024	0.054
<i>Socio-economic</i>								
Log household income			-0.035**	0.017			-0.035**	0.017
Log household wealth			-0.012	0.013			-0.013	0.013
<i>Health-related</i>								
Disabled			0.391***	0.141			0.389***	0.141
Number of IADL			0.258****	0.030			0.258****	0.030
Number ADL			0.016	0.035			0.015	0.035
Self-rated health			0.406****	0.025			0.406****	0.025
GALI limitations			0.014	0.025			0.015	0.025
Heart attack			0.051	0.069			0.047	0.069
Hypertension			0.157***	0.051			0.160***	0.051
Stroke			-0.183	0.120			-0.180	0.120
High blood sugar/diabetes			0.068	0.088			0.066	0.088
Chronic lung disease			0.111	0.089			0.112	0.089

Significance: \*\*=5%, \*\*\*=1%, \*\*\*\*=0.1%

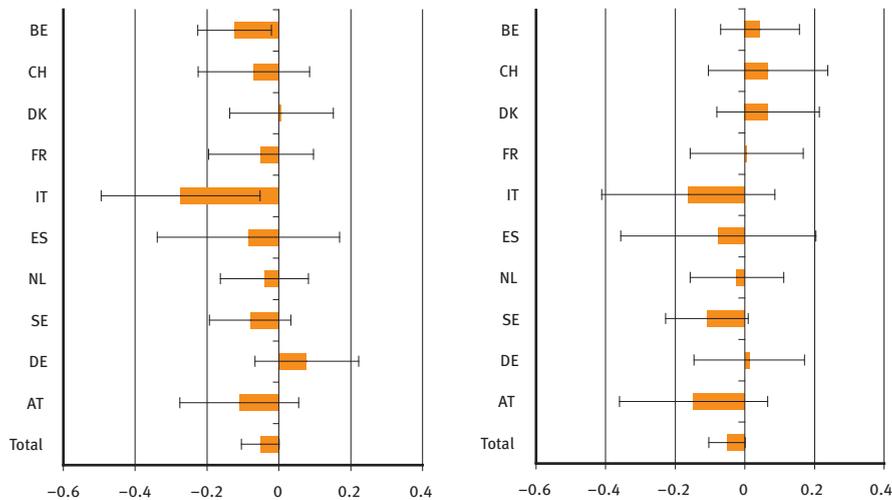
Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

ventional levels of statistical significance ( $p = 0.06$ ). The largest influence on the increase in depressive symptoms during the two year follow-up was observed for losing a spouse, becoming unemployed, and increasing the number of limitations in instrumental activities in daily living. Among the types of social activities, initiating religious/church activities predicted a decline in depressive symptoms in the short term, even after controlling for a wide range of potential confounding factors.

Over a medium period of time (an additional 4 years follow-up), findings were remarkably similar (Table 34.2). Changes in social participation predicted a change in depressive symptoms, but after including control variables the estimate decreased by 39 per cent and was no longer statistically significant. Among the social activities, only changes in religious/church activities predicted changes in depressive symptoms after taking into account all control variables. In general, baseline variables with the highest influence on increase in depressive symptoms after two years were less predictive of changes in depressive symptoms during another four years.

## **34.5 Social participation and depressive symptoms: does country context matter?**

In most countries, except for Denmark and Germany, initiating social activities over the short term was related to declines in depressive symptoms during the two-year follow-up (Figure 34.2). But, only in Italy and Belgium did contemporaneous changes in social participation have a significant impact on changes in depressive symptoms. The overall impact of a change in social activities was of borderline significance after controlling for other factors. Moreover, the geographical pattern could not be explained by the proportion of respondents engaged in social participation activities or by prevalence of depressive symptoms. In the lagged analysis with an additional four-year follow-up, the influence of social activities was smaller in most countries and not significant.



(a) Effect of a change in contemporaneous social participation on a change in depressive symptoms, 2004/5 and 2006/7 (n=9,346)

(b) Effect of a change in lagged social participation on a change in depressive symptoms, 2004/5, 2006/7, 2010/11 (n=9,373)

**Figure 34.2:** Effect of a change in social participation on a change in depressive symptoms  
Source: SHARE Wave 1 release 2.5.0, Wave 2 release 2.5.0, Wave 4 release 1

## 34.6 Religious and church activities reduce depressive symptoms most

Our study showed that initiating social participation activities predicted a decline in depressive symptoms in the short-term. But adjustment for socio-demographic and health-related factors attenuated the association between increased social activities and decreased depressive symptoms. A follow-up analysis showed, moreover, that the influence of new social activity on the decrease in depressive symptoms during the first two years was not maintained over four more years. In-depth analysis of the types of social activities showed that becoming engaged in religious and church activities reduced depressive symptoms, both in the short and medium term. Countries varied markedly in their levels of social participation and prevalence of depressive symptoms, and changes over time in participation and depression were mostly modest. In contrast to our initial hypothesis, no clear geographical pattern in the associations between social participation and depressive symptoms could be discerned.

The longitudinal analysis on change in social participation and depressive symptoms during the first two years of follow-up suggests that participation does influence the presence of depressive symptoms. However, this association was primarily determined by becoming engaged in religious and church activities. The same associations were not found in other social activities, namely sport, social and club activities and voluntary and charity work. There are compelling suggestions from several studies that religious involvement (e. g. service attendance, religious guidance, religious coping) has a protective effect against the incidence and persistence of depressive symptoms and depressive disorders (George 2011) and is associated with fewer depressive symptoms overall (Holt et al. 2011). It may be concluded that providing a sense of purpose and meaning in life is an important principle for preventing depression. However, the influence of religion may also be the result of strong social ties and social support in religious communities. In this respect, it is also of interest to note that the short-term effect of becoming engaged in religious activities was sustained in a medium-term effect after four more years. More in-depth analyses are necessary to evaluate whether the large decrease in religious activities that was observed in Austria biased these findings and whether the observed increase in religious activities over time in most countries depends on health status and depressive symptoms at baseline.

Voluntary and charity work as a form of social participation was not associated with any change in depressive symptoms. This finding seems to be in contrast with the results from previous research (Piliavin et al. 2007, Li & Ferraro 2011). A potential explanation for differences across longitudinal studies is that it may be questioned whether in this population clear changes in volunteering behaviour can be expected. Indeed, in most countries in the SHARE study the proportion of respondents involved in voluntary and charity work was remarkable stable during the two year period and, thus, the change in this type of social participation may have been too small to detect any meaningful influence of presence of depressive symptoms.

As for involvement in sport, social and club activities, the observed associations suggest at best a modest reduction of depressive symptoms, but statistical significance could not be demonstrated. It is of interest to note that in all but one country the proportion of respondents engaged in sport, social, and club activities increased by one per cent to eight per cent. It is not possible to disentangle whether this reflects a true change in participation or whether the inhabitants with a more active lifestyle were more likely to participate in the follow-up waves of SHARE. Selective attrition may bias any association between this type of participation and change in depressive symptoms towards a null association.

Several health-related variables predicted an increase in depressive symptoms in the short and longer run. Moreover, their predictive power was not influenced by adjustment for types of social participation. Thus, health status did

not confound the reported impact of becoming engaged in social activities on decrease in depressive symptoms. A similar pattern was also observed for other determinants of depressive symptoms, most notably losing a spouse, being unemployed, and having less wealth. This supports the evidence for a causal effect of participation on presence of depressive symptoms.

A strength of this study was its use of longitudinal data. Previous research has relied mainly on cross-sectional findings. Moreover, by employing a fixed approach we were able to control for time-invariant confounders. We investigated causality by relating changes in participation to changes in depressive symptoms. While reverse causality cannot be fully ruled out in a fixed effect setting, the fact that effects of some forms of social participation, and particularly participation in religious communities, remained over a four year period suggests a potential sustained effect on depressive symptoms.

Nevertheless, one shortcoming of the study should be noted. We were unable to assess changes in social participation between the first and last wave of data collection and their impact on changes in symptoms of depression due to changes in the recall period used in the question assessing social participation in Wave 4. This would have been of interest, since changes in social participation over time may also be linked to attrition from the study.

In conclusion, our results suggest that participation in religious and church activities is associated with reduced risk of developing depressive symptoms, an effect that persists over a prolonged period of at least four years. If proven causal, these results would suggest that policies that encourage or enable older individuals to maintain their affiliation to religious or church communities (e. g., by facilitating their attendance to their religious communities via public transport) may result in reduced prevalence of depressive symptoms among older persons. Further research is required to disentangle the nature of this effect, and to examine whether it is the purpose in life provided by a religious affiliation, or the community support received at church, which brings a mental health benefit. Whatever the explanation, the results suggest that places of worship may offer a relevant setting for the implementation of programmes to prevent depressive symptoms among people in late life.

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