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## 23 The role of social networks and disability in survival

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- ▶ Having abundant social networks protects from dying earlier among people with everyday activity limitations and those without as well
  - ▶ People with everyday activity limitations who have no friends in their social network die earlier
  - ▶ Having children in the social network does not increase survival of people with activity limitations
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### 23.1 Introduction

Disability involves functional decline and/or difficulties in performing roles or activities. The possibility of developing a disability and the risk of death both increase in late life. However, social relations may prevent or alleviate disability by providing information, giving personal or practical support, promoting self-affirmation and encouraging self-efficacy. Social ties can also modify individual biological processes that may lead to disability-related health conditions. Thus, social relations constitute an important factor in the disablement process (Verbrugge and Jette, 1994).

### 23.2 Social networks and disability

Social networks are the collection of ties that people variously maintain over their life course. Larger network size is positively related to health and survival. However, the number of members in the network can decline with age. If the size reduction is voluntary, it can have a positive effect on health. However, network reduction may negatively affect one's well-being, which, in turn, lowers one's chances of survival. Interestingly, networks may grow in the initial stages of a member's functional impairment. Nevertheless, these same ties may disappear over time due to difficulties in maintaining relationships when disabled (Tough, Siegrist and Fekete, 2017).

The quality and type of the relationships can compensate for having few social ties. Strong ties, often represented by close family members, generally

remain in the network when a person is disabled. Weak ties, on the other hand, do not usually provide long-term care (Granovetter, 1973) and may drop out of a network when activity limitations require the receipt of greater practical support.

Low frequency of contact with the network is related to a greater risk of functional decline (Stuck et al., 1999). However, contact frequency may also increase when disability emerges, due to the need for daily support or supervision (Cornwell, 2009). This latter phenomenon may be associated with an increased mortality risk. Given the importance of social ties in relation to the disability/ mortality nexus, the study reported in this chapter sought to clarify which social network characteristics affect the timing of death among disabled older people.

### 23.3 Data, variables and method

We focused on people interviewed in Wave 4 of SHARE (2010–2011) and studied how their social networks were related to survival up to the end of Wave 7 (2017), according to disability status. Due to overlapping social networks within couples, we included only one respondent from each couple in the analysis ( $n = 32,145$ ). A total of 11.4 per cent (3,650) of respondents died during the observation period. The dependent variable in the study was timing of death, measured in years. For the survivors, the last interview time was calculated as the exit time. For 314 of those who had died, the time of death was not identified from the interview, and this was imputed based on the country-specific age and sex-based average probability of dying.

First, we analysed people with all social network sizes (0 – 2+) in the survival models (32,145 individuals, 3,650 deaths, excluding those for whom information on study variables was missing). The second set of models was run for those having at least one network member (30,613 individuals, 3,334 deaths).

The main stratifying variable was disability status, indicating having everyday activity limitations or not. Independent social network variables were derived from the SHARE name generator of one's closest ties and included the following: network size, number of children in the network, emotional closeness with the closest member, contact frequency with family, and having friends in the network. We also included the following variables as controls: gender, age, partnership status, education. All these variables were measured at Wave 4.

Cox survival regression analysis was used to explore the timing of death between Wave 4 and Wave 7, including interactions between disability status

and network. The 12 countries that participated in all four waves were classified into five regions: Germanic (Austria, Germany, Switzerland), Nordic (Denmark, Sweden), southern European (Spain, Italy), French-speaking (Belgium, France), and eastern European (the Czech Republic, Slovenia, Estonia).

## 23.4 Descriptive results

The southern and eastern European regions had the highest proportions of deaths. People with limitations had almost three times the likelihood of dying (16%) compared to those without limitations (6.2%). Among those with at least one network member, the difference in the proportions of deaths between those with everyday activity limitations and those without limitations was approximately 40 per cent (13.8% and 9.7%, respectively). The largest share of deaths in the full sample occurred among people without any network members (20.3%), followed by respondents with one network member (13.8%) and those with two or more members (9.8%).

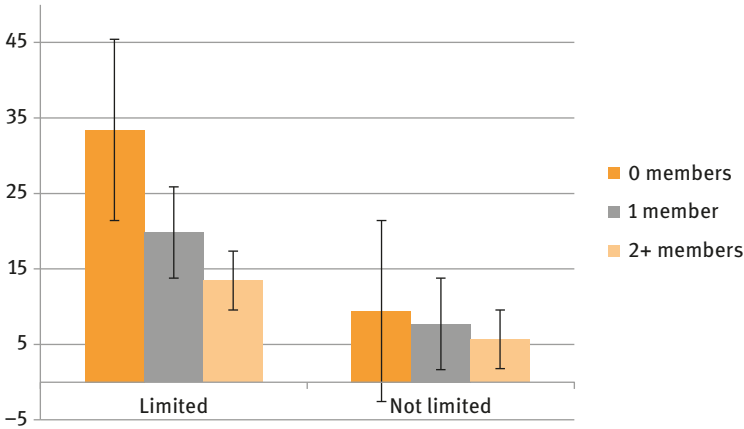
People with one child in their network had the largest proportion of deaths (12.4%), followed by those with two or more children in the network (11%). Additionally, people who reported being only somewhat close (or less) to the closest member had a larger proportion of deaths (15.3) than those who were very or extremely close (10.6%). Respondents with no reported contact frequency or no reported family members had the greatest proportion of deaths (15.5%), followed by those with only seldom contact with family members (13.7%). More people with no friends in the network (12.3%) died than people with friends (8.3%).

Figure 23.1 describes the proportion of survivors and deceased people by everyday activity limitations and network size. Figure 23.2 presents the respective survival curves by activity limitation (or not) and network size.

## 23.5 Network and disability dynamics in survival

The survival time of people from the eastern European region was the shortest, but it did not differ statistically from that of the Nordic group (Table 23.1). Southern Europeans followed in their survival time. The French-speaking countries had the longest survival time.

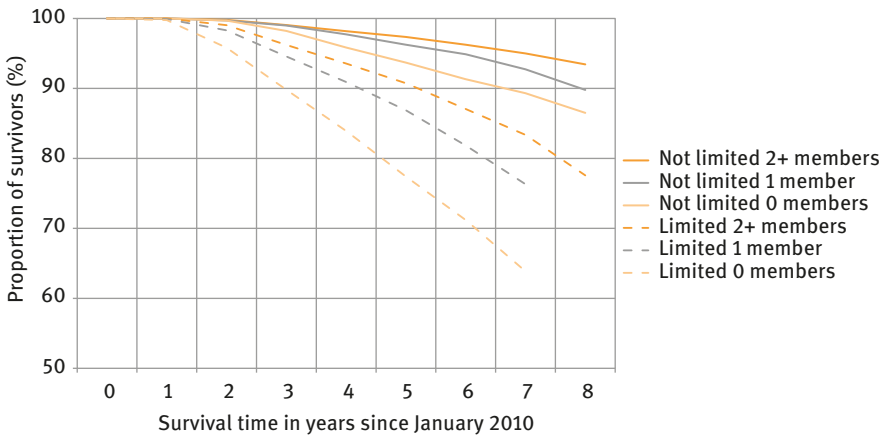
People with no limitations in Wave 4 died later than those with limitations. In terms of network size, the smaller the network, the earlier the time of death. Respondents reporting no network members had the earliest time of death.



**Figure 23.1:** Proportion of deceased individuals by everyday activity limitations and network size.

**Note:** n = 32,145, death events = 3,650.

**Source:** SHARE Wave 1, 2, 4, 5, 6 release 6.1.0, Wave 7 release 0.



**Figure 23.2:** Kaplan-Meier survival curve by everyday activity limitations and network size.

**Note:** n = 32,145, death events = 3,650.

**Source:** SHARE Wave 1, 2, 4, 5, 6 release 6.1.0, Wave 7 release 0.

Interactions between disability and network size indicated that those with no limitations and abundant networks (2+ members) were best off in terms of survival, followed by respondents with no limitations and one network member. People with limitations and two or more members did not differ in their survival

**Table 23.1:** Cox survival regression results of timing of death between 2010 and 2017 for all people.

Variables	Cox	
	Hazard Ratio	Standard Error
Age (65–79)	2.911***	(0.137)
Age (80+)	9.773***	(0.050)
Gender (female)	0.556***	(0.020)
Education (secondary)	0.866***	(0.035)
Education (tertiary)	0.648***	(0.036)
Education (in school/ other)	0.868	(0.211)
Partner in household (yes)	0.682***	(0.026)
Region (Germanic)	0.668***	(0.049)
Region (Nordic)	1.004	(0.060)
Region (South)	0.879**	(0.050)
Region (French)	0.656***	(0.048)
Limitations (none)	0.513***	(0.020)
Network size (0)	1.570***	(0.097)
Network size (1)	1.239***	(0.045)
<i>Interaction</i>		
No limitations * 0 members	0.813	(0.096)
No limitations * 1 member	0.642***	(0.039)
No limitations * 2+ members	0.507***	(0.025)
Limitations * 0 members	1.558***	(0.110)
Limitations * 1 member	1.229***	(0.053)

**Significance:** \*\*\* = 1%; \*\* = 5%; \* = 10%.

**Note:** n = 32,145, death events = 3,650.

**Reference categories:** Age (50–64), Gender (male), Education (basic), Region (Eastern), Limitations (yes), Network size (2+), Limitations (yes)\*Network size (2+).

**Source:** SHARE Wave 1, 2, 4, 5, 6 release 6.1.0, Wave 7 release 0.

outcomes from those with no limitations, but no network members. Respondents with limitations and no network members died the earliest.

Separate Cox survival regression models for respondents with at least one network member helped to clarify the role of other network characteristics besides size in survival. Beyond the basic size associations reported earlier, these analyses showed that having two or more children in one's social network was not related to dying later. Respondents without limitations had half the risk of dying earlier compared to people with limitations and two or more children in the network. At the same time, those with limitations and any other number of children in the network did not differ from the reference group. Thus, the number of children in one's network did not influence the timing of death by disability status among those having at least one network member.

Respondents who had only somewhat or less close ties and who had limitations had the highest hazard of dying earlier, but it was not significantly different from those with extreme closeness and limitations. Again, respondents with no limitations had half the risk of dying earlier than the reference group, irrespective of the closeness intensity. It seems, therefore, that level of closeness with network members did not make a difference in the timing of death.

Contact frequency with family members also did not make a difference in the timing of death. In this case, what mattered most was having limitations or not. However, those not limited in their everyday activities and communicating with their family members several times a week or more did have the best survival chances. Those with limitations and daily communication, on the other hand, had the highest hazard of dying earlier, twice higher the risk of those with no limitations and daily contact frequency (HR 2.01, CI 1.80 – 2.24).

Finally, respondents with limitations and no friends in their network had a higher risk of dying earlier (HR 2.02, CI 1.77 – 2.29) than those with friends in their network (HR 1.74 CI 1.51 – 2.00). For people without limitations, however, having friends did not make a difference.

## 23.6 Conclusions and policy implications

We found that the survival outcomes by different network characteristics follow, to a large extent, similar patterns as general health outcomes reported in the research literature. In general, larger networks protect from dying earlier among those with activity limitations as well as those without. Moreover, people with health concerns benefit from having more confidants around, but not to the same extent that non-limited persons with one or more confidants do. Having confidants nearby may be beneficial because they point to or motivate better health behaviour. In terms of having children in one's network, the findings suggest that children appear in one's network when one develops serious health concerns.

The level of closeness with network member(s) does not explain survival differences between those with or without limitations. We should point out that the results in this indicator may be partly biased due to the method of recording social networks in SHARE – these tend to be strong personal ties with whom satisfaction and closeness is relatively high anyway, and therefore closeness does not vary a lot. Finally, results for friends suggest that they drop out when one has more advanced activity limitations, perhaps due to higher need in their interactions or peers dying. In any case, people with limitations and no friends in their network tend to have the highest risk of dying earliest.

Developing home-based long-term care services for disabled older people, especially those in advanced stages, can reduce the care burden of children and others, such as friends. This will enable the closest network members to reduce their daily physical care responsibilities and free them to provide emotional support and affection, which they most likely can do better. In addition, developing more community-centred activities may help people with disabilities to stay involved in social activity longer, meet new people and develop new ties.

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## References

- Cornwell, B. (2009). Network bridging potential in later life: life-course experiences and social network position. *Journal of Aging and Health*, 21(1), pp. 129–54.
- Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), pp. 1360–1380.
- Stuck, A., Walthert, J., Nikolaus, T., Buela, C., Hohmann, C. and Beck, J. (1999). Risk factors for functional status decline in community-living elderly people: a systematic literature review. *Social Science and Medicine*, 48(4), pp. 445–469.
- Tough, H., Siegrist, J. and Fekete, C. (2017). Social relationships, mental health and wellbeing in physical disability: a systematic review. *BMC Public Health*, 17(414), pp. 2–18.
- Verbrugge, L. and Jette, A. (1994). The disablement process. *Social Science and Medicine*, 38(1), pp. 1–14.

