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Lonelier than ever? Loneliness of older people over two decades

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ABSTRACT

To live with feelings of loneliness has negative implications for quality of life, health and survival. This study aimed to examine changes in loneliness among older people, both with regard to prevalence rates, and socio-demographic, social and health-related correlates of loneliness.

This study had a repeated cross-sectional design and was based on the nationally representative Swedish Panel Study of Living Conditions of the Oldest Old (SWEOLD). Analyses of trends in loneliness covered the years 1992, 2002, 2004, 2011 and 2014, and included people aged 77 years or older ($n = 2\,572$). Analyses of correlates of loneliness covered 2004 and 2014, and included people aged 70 years or older ($n = 1\,962$). Logistic regression analyses were conducted with findings presented as average marginal effects.

Contrary to what is often assumed, there has been no increase in loneliness among older people over time (1992–2014). Regression analyses for 2004 and 2014 showed that social and health-related correlates were more strongly associated with loneliness than socio-demographic correlates. Psychological distress was most strongly associated with loneliness, followed by widowhood. Most associations between the correlates and loneliness were stable over time.

1. Introduction

Loneliness has been defined as the discrepancy between an individual's desired and achieved levels of social relationships (Perlmán & Peplau, 1981). To live with feelings of loneliness is not only a problem in itself, it also has implications for quality of life, physical and mental health, and mortality (e.g. Hawkey and Cacioppo, 2010; Holt-Lunstad et al., 2015; Hawkey & Cacioppo, 2010; Holt-Lunstad et al., 2015; O'Lunaigh & Lawlor, 2008).

There is a common belief that older people experience loneliness more often than other age groups. For example, in both 1982 and 2005, the vast majority of respondents in a Swedish population survey believed that almost half of the pensioners often feel lonely (Tornstam, 2007) and images that older people suffer from loneliness are often spread in media (cf. Ferreira-Alves, Magalhaes, Viola, & Simoes, 2014). Another common belief is that recent cohorts of older people experience loneliness to a larger extent than previous cohorts, as a result of changes in family patterns, such as smaller family size, increased divorce rates and greater geographical distance between family members (Dykstra, 2009), and transitions towards more individualistic societies (World Values Survey, 2016). Changes in family patterns and societal changes also mean that there may be other groups of people that are vulnerable to loneliness today than in earlier cohorts, that is, that

factors associated with loneliness may have changed over time. Based on a Swedish national survey, this study will examine whether loneliness among older people has increased in the last two decades and whether there have been any changes in socio-demographic, social and health-related factors associated with loneliness.

1.1. Trends in loneliness

The assumption that loneliness among older people has increased over time has been disputed, and a research review has found a slight decrease in loneliness (Dykstra, 2009). More recent studies have found that there is no change over time (Honigh-de Vlaming, Haveman-Nies, Groeniger, de Groot, & van 't Veer, 2014) or decreased levels of reported loneliness (Eloranta, Arve, Isoaho, Lehtonen, & Viitanen, 2015). In a British study, levels of loneliness among older people in 1999 were compared to findings in studies conducted between 1945 and 1960. Even in such long time perspective, no increase in severe loneliness was found (Victor et al., 2002).

1.2. Factors associated with loneliness

Factors associated with feelings of loneliness can be grouped into socio-demographic, social and health-related factors. Starting with

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Table 1

Number of respondents and response rates in SWEOLD for people aged 77 years or older in 1992, 2002, 2004, 2011 and 2014, and for people aged 70 years or older in 2004 and 2014.

	1992		2002		2004		2011		2014		2004		2014	
	Age 77 +		Age 77 +		Age 77 +		Age 77 +		Age 77 +		Age 70 +		Age 70 +	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Respondents	537	95.4	621	84.4	648	89.3	647	86.4	575	84.6	1110	87.5	1226	84.4
Direct interviews	473	88.1	539	86.8	509	78.5	541	83.6	553	96.2	929	83.7	1106	90.2
Indirect interviews	64	11.9	82	13.2	139	21.5	106	16.4	22	3.8	181	16.3	120	9.8
Non-response	26	4.6	115	15.6	78	10.7	102	13.6	105	15.4	158	12.5	227	15.6
Gross sample	563	100.0	736	100.0	726	100.0	749	100.0	680	100.0	1268	100.0	1453	100.0

socio-demographic factors, loneliness is more common among the oldest old than in younger age groups (O'Luanaigh & Lawlor, 2008; Pinguart & Sørensen, 2001; Routasalo & Pitkala, 2003), and loneliness in older people increases with age (Dahlberg, Andersson, McKee, & Lennartsson, 2015; Heikkinen & Kauppinen, 2011; Jylhä, 2004). Loneliness is also more often found in women than men (Aartsen & Jylhä, 2011; Cohen-Mansfield et al., 2009; Dykstra, van Tilburg, & de Jong Gierveld, 2005). However, research has shown that these associations with loneliness have less to do with age and gender *per se* than with associated factors such as widowhood and greater levels of health problems among the oldest old and among women (Dahlberg et al., 2015).

Low socioeconomic status is another socio-demographic factor associated with loneliness. Education and income have often been used as indicators of socioeconomic status. Both these indicators have been found to be associated with loneliness, partly due to fewer possibilities for social participation and smaller social networks among people with low levels of income and education (see Dykstra & de Jong Gierveld, 1999; Jylhä & Saarenheimo, 2010; Pinguart & Sørensen, 2001; Routasalo & Pitkala, 2003; Savikko, Routasalo, Tilvis, Strandberg, & Pitkala, 2005).

Social factors influencing loneliness include, for example, marital status, social support and social contacts. There is a large body of research showing an association between marital status and loneliness. More specifically, the loss of partner is a key predictor of loneliness in old age (Aartsen & Jylhä, 2011; Dahlberg & McKee, 2014; Dahlberg et al., 2015; Dykstra et al., 2005; Jylhä & Saarenheimo, 2010). As people age and are confronted with health problems, social contacts may focus more on the need for support, and people with larger social support networks have been found to be less likely to report loneliness (Dahlberg, Andersson, & Lennartsson, In press; Dykstra & Fokkema, 2007). Low levels of social contacts also increase the risk of loneliness (e.g. Ayalon, Shiovitz-Ezra, & Palgi, 2013; Victor, Scambler, & Bond, 2009).

Finally, health problems, such as mobility difficulties and depression have been found to be associated with loneliness (Aartsen & Jylhä, 2011; Cohen-Mansfield et al., 2009; Heikkinen & Kauppinen, 2011; O'Luanaigh & Lawlor, 2008; Tjshuis et al., 1999). People with low physical functioning are more likely to experience loneliness (Aartsen & Jylhä, 2011; Honigh-de Vlaming et al., 2014; Jylhä, 2004; Routasalo & Pitkala, 2003), as mobility difficulties may be a barrier to social engagement (Cohen-Mansfield & Pappura-Gill, 2007). A recent study has shown that loneliness has become more common over time among people with low physical functioning (Honigh-de Vlaming et al., 2014). Psychological problems, such as depression and anxiety, have also been found to be associated with higher levels of loneliness (Eloranta et al., 2015; Heikkinen & Kauppinen, 2011; O'Luanaigh & Lawlor, 2008).

In this study, loneliness among the oldest old in Sweden over the last two decades is examined. The aim is to identify changes in loneliness over time, both with regard to prevalence levels and to socio-demographic, social and health-related factors associated with loneliness.

2. Design and methods

2.1. Sample

This study has a repeated cross-sectional design and is based on the Swedish Panel Study of Living Conditions of the Oldest Old (SWEOLD) (Lennartsson et al., 2014). SWEOLD is a nationally representative survey of the oldest old (born between 1892 and 1944) living in Sweden at the time of data collection. SWEOLD provides comparable data from 1992, 2002, 2004, 2011 and 2014. The SWEOLD sample includes respondents aged 77 years or older in 1992, 2002 and 2011. In 2004 and 2014, the sample was extended to include individuals aged 70 years or older. Face-to-face interviews were carried out as the main interview mode in 1992, 2002 and 2011. In 2004 and 2014, telephone interviews were used as the main interview mode. In 2004, 2011 and 2014, postal questionnaires were used if the respondent did not agree to an ordinary interview or was unable to conduct an ordinary interview due to, for example, hearing problems. There were no significant differences in reported loneliness across the interview modes ($p = 0.192$).

The response rates varied between 84.4 and 95.4 percent (see Table 1). The low non-response rates, the inclusion of institutionalized persons and the use of proxy informants for people unable to be interviewed directly ensure that the SWEOLD sample is representative of older people in Sweden in each interview wave. In total, 4 566 interviews have been conducted. In some interview waves, only directly interviewed respondents have received the question about loneliness. Therefore, the analytical sample for this study excluded respondents who could not perform the interview on their own (see Table 1).

In this study, analyses of the trends in loneliness from 1992 to 2014 included people aged 77 years or older, with an analytical sample of 2 572 (approximately 500 in each data collection wave; see Table 1). In analyses to determine whether the association of sociodemographic, social and health factors with loneliness have changed over time, 2004 and 2014 interview waves were used. These interview waves used the same main interview mode and included people age 70 years or older, with an analytical sample of 1 962 ($n = 921$ in 2004; $n = 1 041$ in 2014).

Informed verbal consent was obtained prior to each interview. Ethical approvals for the SWEOLD study have been provided by Uppsala University Hospital (reg.no. 247/91), Karolinska Institutet Regional Research Ethics Committee (reg.no. 03-413) and the Regional Ethical Review Board in Stockholm (reg.no. 04-314/5; 2010/403-31/4; 2014/1003-31/5).

2.2. Material

2.2.1. Dependent variable

Loneliness was measured through the item: "Are you ever bothered by feelings of loneliness?" with four response categories. Analyses of trends in the prevalence of loneliness present data on all four response categories. Due to small numbers in some of the response categories, loneliness was transformed into a dichotomous variable for the regression analyses, indicating being frequently lonely (collapsing

response categories: nearly always and often) and rarely lonely (collapsing response categories: seldom and almost never).

2.2.2. Independent variables

Socio-demographic variables included gender, age in years and educational level (1 = lower education level, defined as grade school, 0 = higher education level, defined as beyond grade school).

Social factors included marital status (married/cohabiting, divorced/unmarried and widow/widower), social support and social contacts. Regarding marital status, divorced and unmarried individuals were grouped due to small numbers of respondents in these groups. Information about social support was collected via the item “One sometimes needs help and support from someone. Do you have any relative or close friend who helps out if you need to talk to someone about personal problems?” (response alternatives: Yes; No). Social contacts were measured via four items concerning visiting and/or being visited by friends and/or relatives (response alternatives: No (0); Yes, sometimes (1); Yes, often (2)). This social contact scale was reversed and ranged from no social contacts (8) to frequent social contacts (0).

Finally, health-related factors covered limitations in activities of daily living (ADL) and psychological distress. ADL reflected the number of the following areas with which the respondent reported difficulties: eating, getting into and out of bed, going to the toilet, getting dressed, and washing one’s hair (scale range: 0–5). Psychological distress was measured via an item asking whether respondents had experienced “anxiety, nervousness or angst” in the 12 months preceding the interview (response categories: No; Yes, mild; Yes, severe).

2.3. Analysis

Analysis was directed towards determining trends in loneliness for the total sample. This was done via descriptive analyses. For tests of statistical significance in trends over time, linear and logistic regression analyses were used. Gender differences were analysed via Chi-square tests.

Thereafter, analyses were performed to identify correlates of loneliness in 2004 and 2014. As a first step, descriptive analyses were performed for the total sample in 2004 and 2014. Thereafter, logistic regression analyses were undertaken for the same samples with the margins option in STATA 12. This produces coefficients as average marginal effects (AME). Unlike odds ratios, AMEs can be compared across models and outcomes. AMEs are interpreted as the average impact on the probability of experiencing loneliness. Bivariate analyses were performed to identify associations between independent variables and loneliness (dependent variable) in 2004, and between independent variables and loneliness (dependent variable) in 2014. In addition, multivariable logistic regression analyses were performed with AMEs for 2004 and 2014, respectively. All independent variables were entered simultaneously into each regression analysis. Changes in correlates over time were further examined via analyses of interaction between correlates and survey year.

Some respondents have been included in SWEOLD at more than one wave of data collection. Therefore, Huber-White sandwich estimator of variance was used to account for intra-individual correlations for analyses of change over time. For all analyses, the criterion for test significance was $p < 0.05$. Data were analysed using STATA 12.

3. Results

3.1. Characteristics of the 77+ sample

Analyses of trends in loneliness among older people over the last two decades are based on samples of people aged 77 years or older in 1992, 2002, 2004, 2011 and 2014. The characteristics of these samples were presented in Table 2. The majority of the respondents were women and the average age was approximately 83 years. There was a

decrease in people with lower education over the study period. Regarding social factors, there was an increase in the proportion of married respondents and a decrease in the widowed respondents. Engagement in social contacts and access to social support increased over the years (although the item on social contacts was not included in 1992). Seen over the entire study period, there was no significant change in ADL problems, but there was a decrease in ADL problems from 1992 to 2004 ($p = 0.019$), and an increase in the years after that ($p = 0.045$). Finally, there was a decrease in psychological distress among the respondents.

3.2. Trends in loneliness from 1992 to 2014 (77+)

Fig. 1 presents trends in loneliness, and shows that the proportion of older people reporting feelings of loneliness was fairly stable over the study period. Over the years, between 3.86 (year 1992) and 1.86 (year 2014) percent of the respondents reported being bothered by feelings of loneliness almost all the time, while between 8.6 (year 1992) and 11.1 (year 2004) percent of the respondents reported being bothered by feelings loneliness often. Changes in prevalence level of loneliness over the years were not significant.

A higher proportion of women than men reported loneliness, significant for 2002, 2004 and 2011 ($\chi^2 = 21.93$, $p < 0.001$; $\chi^2 = 18.76$, $p < 0.001$; $\chi^2 = 18.88$, $p < 0.001$). These years, a lower proportion of women than men responded ‘almost never’ being lonely, while higher proportions of women responded that they were ‘seldom’ and ‘often’ lonely.

3.3. Characteristics of the 70+ sample

Characteristics of the 2004 and 2014 samples of people aged 70 years or older are presented in Table 3. Both years, a majority of the sample was women, and the average age was approximately 78 years. A higher proportion of the respondents in 2004 than in 2014 had a lower education. There was an increase in the proportion of respondents that was married and a decrease in the proportion of respondents that was widowed between these years, while the proportion that was unmarried or divorced was fairly stable.

Regarding social variables, in 2004 the respondents on average had fewer social contacts than the respondents ten years later. The majority of the respondents had access to social support both years, and there was an increase in access to social support over the study period. The vast majority of the respondents had no ADL limitations and there was no significant change over the study period. Similarly, the majority of the respondents did not report psychological distress and such problems became less common from 2004 to 2014.

3.4. Loneliness and its bivariate correlates in 2004 and 2014 (70+)

As presented in Table 4, 9.88 percent of the respondents reported feelings of loneliness in 2004 compared to 7.68 percent in 2014 (not significant change). Table 4 also presents descriptive results on loneliness in relation to different characteristics of the respondents, and bivariate associations between loneliness and these characteristics in 2004 and 2014, respectively. Starting with socio-demographic factors, more women than men were bothered by feelings of loneliness, although the association between loneliness and gender was only significant in 2014, when 10.0 percent of women reported loneliness compared to 4.9 percent of men. The likelihood of loneliness was associated with higher age both years. In 2004, loneliness was more often reported by people with lower than higher education level. There was no such association in 2014.

The analyses show that social factors are important for loneliness. Regarding marital status, a lower proportion of married individuals reported loneliness. In 2004, a higher proportion of non-married/divorced and widowed respondents reported loneliness, with particularly

Table 2
 Characteristics of samples aged 77 years or older in 1992, 2002, 2004, 2011 and 2014 (%), n = 2572.

	1992 (n = 466)	2002 (n = 518)	2004 (n = 505)	2011 (n = 536)	2014 (n = 547)	p for trend
Loneliness	12.4	13.3	14.9	13.4	11.3	0.709
Female gender	59.4	57.7	59.9	60.1	57.8	0.854
Lower education level ¹	78.7	69.3	65.3	57.1	51.6	0.000
Marital status						
Married	39.3	39.2	40.3	46.1	48.8	0.001
Unmarried/divorced	12.0	12.7	11.3	14.9	13.2	0.311
Widowed	48.7	48.1	48.4	39.0	38.0	0.000
Lack of access to social support ²	4.55	9.02	10.3	8.49	8.18	0.038
Psychological distress ³						
No problem	76.5	74.3	73.8	71.4	81.6	0.404
Mild problem	18.4	19.7	21.1	21.6	14.9	0.495
Severe problem	5.18	5.98	5.17	7.01	3.49	0.662
	M (SD) range	M (SD) range	M (SD) range	M (SD) range	M (SD) range	p for trend
Age	82.7 (3.95) 77–98	82.8 (4.54) 77–98	82.6 (4.43) 77–97	83.1 (4.91) 77–101	82.7 (4.61) 77–95	0.574
Fewer social contacts ⁴	–	4.15 (1.96) 0–8	4.19 (1.97) 0–8	3.79 (1.96) 0–8	3.91 (1.93) 0–8	0.002
ADL limitations ⁵	0.40 (0.96) 0–5	0.37 (0.90) 0–5	0.22 (0.65) 0–4	0.27 (0.77) 0–5	0.33 (0.97) 0–5	0.085

¹ Item non-response varied between 1 and 12.
² Item non-response varied between 1 and 65. The item was not included in the postal questionnaire.
³ Item non-response varied between 3 and 8.
⁴ Item non-response varied between 1 and 2. The item was not included in 1992.
⁵ Item non-response varied between 1 and 5.

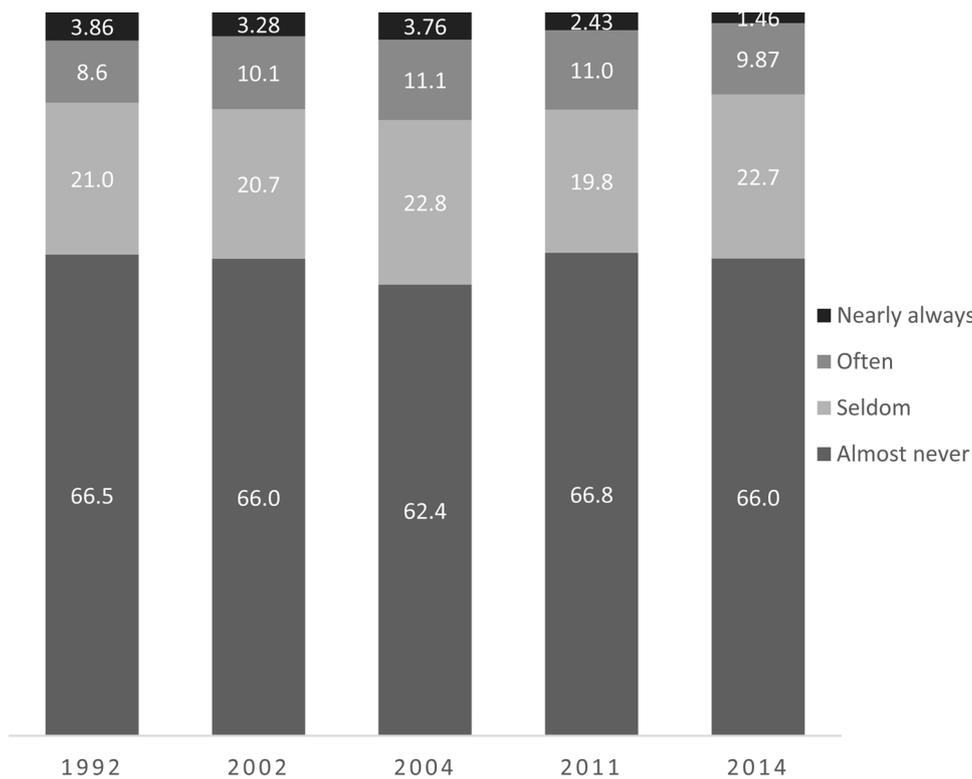


Fig. 1. Trends in loneliness among people aged 77 years or older in the period of 1992–2014 (%). (1992: n = 466; 2002: n = 518; 2004: n = 505; 2011: n = 536; 2014: n = 547).

high proportions of loneliness among those widowed. Both years, people who lacked access to social support and people with fewer social contacts were more likely to report loneliness. Regarding health factors, in both years ADL limitation and psychological distress increased the likelihood of loneliness.

The interaction between each correlate and survey year was tested (not shown in table). A significant interaction term was found regarding ADL limitations ($p = 0.043$), where there was a significantly stronger association between ADL limitations and loneliness in 2004 than in 2014. For all other variables, the interaction with survey year was

Table 3
Characteristics of samples aged 70 years or older in 2004 and 2014 (%), n = 1962.

	2004 (n = 921)	2014 (n = 1041)	p for difference
Loneliness	9.88	7.68	0.078
Female gender	59.1	54.9	0.026
Lower education level	57.2	45.0	0.000
Marital status			
Married	52.0	60.8	0.000
Unmarried/divorced	13.2	14.1	0.525
Widowed	34.7	25.1	0.000
Access to social support	90.6	94.1	0.002
Psychological distress			
No problem	74.9	83.2	0.000
Mild problem	20.6	13.4	0.000
Severe problem	4.45	3.36	0.199

	M (SD) range	M (SD) range	p for difference
Age	78.2 (5.99) 70–97	77.7 (6.13) 70–95	0.065
Fewer social contacts	3.81 (2.05) 0–8	3.58 (1.80) 0–8	0.005
ADL limitations	0.14 (0.53) 0–4	0.20 (0.76) 0–5	0.063

Table 4
Bivariate associations between loneliness and independent variables among respondents aged 70 years or older in 2004 and 2014, n = 1962.

	2004 (n = 921)			2014 (n = 1041)		
	Rarely lonely (%)	Frequently lonely (%)	AME ²	Rarely lonely (%)	Frequently lonely (%)	AME ²
Gender						
Female	88.6	11.4	0.039	90.0	10.0	0.054**
Male	92.3	7.7		95.1	4.9	
Education level						
Lower	88.0	12.0	0.051*	91.4	8.6	0.012
Higher	92.9	7.1		93	7.0	
Marital status						
Married	98.1	1.9	1	97.2	2.8	1
Non-married/divorced	86.9	13.1	0.112***	91.2	8.8	0.060*
Widowed	79.4	20.6	0.187***	81.2	18.8	0.159***
Social support						
Access to support	91.6	8.4		93.6	6.4	
Lack of support	75.9	24.1	0.108***	72.1	27.9	0.118***
Psychological distress						
No problem	93.9	6.1	1	94.7	5.3	1
Mild problem	85.3	14.7	0.086	84.3**	15.7	0.104**
Severe problem	48.8	51.2	0.451	65.7***	34.3	0.290***

	M (SD) range	M (SD) range	AME ²	M (SD) range	M (SD) range	AME ²
Age	77.8 (5.82) 70–97	81.8 (6.27) 70–94	0.009***	77.4 (6.04) 70–95	81.0 (6.34) 70–95	0.006***
Fewer social contacts	3.64 (2.00) 0–8	5.36 (1.85) 0–8	0.038***	3.49 (1.74) 0–8	4.70 (2.11) 0–8	0.026***
ADL limitations	0.10 (0.44) 0–4	0.48 (0.96) 0–4	0.065***	0.17 (0.70) 0–5	0.58 (1.21) 0–5	0.028***

Note 1: * p < 0.05, ** p < 0.01, *** p < 0.001.

Note 2: Bivariate associations presented as average marginal effects (AME).

Table 5
Multivariable analysis presented as average marginal effects for the likelihood of being frequently bothered by feelings of loneliness among respondents aged 70 years or older in 2004 and 2014, $n = 1962$.

	2004 ($n = 921$)	2014 ($n = 1041$)
Female gender	−0.031	0.012
Age	0.002	0.000
Lower education level	0.022	−0.022
Marital status		
Married	1	1
Non-married/divorced	0.090***	0.036
Widowed	0.152***	0.123***
Lack of social support	0.044*	0.059*
Fewer social contacts	0.021***	0.014**
ADL limitations	0.023*	0.012
Psychological distress		
No problem	1	1
Mild problem	0.058**	0.058*
Severe problem	0.366***	0.200**

Note 1: Reference category = rarely lonely.

Note 2: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

statistically non-significant, which suggests that the bivariate associations between these correlates and loneliness were stable over the two time points.

3.5. Multivariable analyses for 2004 and 2014 (70+)

In the multivariable models for 2004 and 2014, presented in Table 5, none of the socio-demographic variables remained significantly associated with loneliness in older people. All social factors included in the study were still associated with loneliness. Being widowed was particularly important for loneliness. This group had 15.2 percent higher likelihood of loneliness in 2004 and 12.3 percent higher likelihood in 2014 than respondents who were married. Also non-married/divorced respondents were more likely to report loneliness than married respondents. Furthermore, respondents who lacked access to social support and had fewer social contacts were more likely to report loneliness than respondents with access to social support and more social contacts.

Finally, health problems were significantly associated with loneliness in the full model. In 2004, but not in 2014, respondents with ADL limitations had a significantly higher likelihood of loneliness than people without ADL limitations. Psychological distress was found to be the strongest correlate for loneliness. In 2004, respondents reporting severe psychological distress were 36.6 percent more likely to report loneliness than respondents without psychological distress. In 2014, the corresponding figure was 20.7 percent.

The interaction between each correlate and survey year was tested in the full models (not shown in table). Interactions between correlates and survey years were found regarding education ($p = 0.047$). *Post hoc* analyses regarding education show that this may be explained by changes in social factors. For example, increases in social contacts over the years have been greater among people with lower than higher education.

4. Discussion

Based on repeated cross-sectional nationally representative surveys of older people in Sweden, the aim of this study was to examine changes in loneliness among older people. Firstly, we examined prevalence levels of loneliness in people aged 77 years or older between 1992 and 2014. Overall, it can be concluded that there has been no increase in loneliness among older people in Sweden in the last two decades. Recent cohorts of older people do not report loneliness to a greater extent than previous cohorts of older people, despite societal changes

towards more individualistic societies (World Values Survey, 2016). Such societal changes have perhaps been counteracted by changes in other factors associated with loneliness, such as increased proportions of married older people and people with higher education. This finding challenges the common myth that loneliness is becoming more prevalent among older people (see Dykstra, 2009). Similar trends of stable, or even slightly decreasing levels, of loneliness have been found in studies conducted in Finland, the Netherlands and Great Britain (Eloranta et al., 2015; Honigh-de Vlaming et al., 2014; Victor et al., 2002). In addition, the study found that more women than men tended to report loneliness. This finding echoes previous research (Aartsen & Jylhä, 2011; Cohen-Mansfield et al., 2009; Dykstra et al., 2005).

Secondly, we examined changes in correlates of loneliness among people aged 70 years or older between 2004 and 2014. Generally, the same correlates were important for loneliness both years, but there were some exceptions, which will be further discussed below.

This study identified associations between loneliness and female gender, higher age and lower education. The association between gender and loneliness was significant in 2002, 2004 and 2011 for those aged 77 years or older, and in 2014 for those aged 70 years or older. Regarding education it was observed that while lower education was associated with an increased likelihood of loneliness in 2004, there was no significant association between education and loneliness in 2014. There was a significant interaction between education and survey year in reporting loneliness, which suggests that the association between education and loneliness is changing. An explanation for this may be that the increase in social contacts has been greater among respondents with lower education than among respondents with higher education.

The importance of other factors than socio-demography was also confirmed in that none of these socio-demographic correlates were significantly associated with loneliness in the multivariable models for 2004 and 2014. In other words, although loneliness is more common among women, people with higher age and lower level of education, it is not gender, age and education level as such that are important for loneliness but other factors that correlate with this (cf. Dahlberg et al., 2015). Turning to such factors, social factors (widowhood, lack of access to social support, fewer social contacts) as well as health-related factors (ADL limitations, psychological distress) proved influential on loneliness. Most social and health-related correlates remained significant in the multivariable models. There is strong evidence that social factors are important for loneliness (for a review, see Routasalo & Pitkala, 2003). The loss of a partner is a particularly strong trigger for loneliness (e.g. Aartsen & Jylhä, 2011; Dykstra et al., 2005; Jylhä & Saarenheimo, 2010), and the importance of widowhood for loneliness was confirmed in our study.

Our results also confirm earlier research showing that physical and mental health is related to loneliness (Routasalo & Pitkala, 2003), as poor health may limit the possibility to lead a socially active life. Different forms of mental health problems, such as depression, are closely linked to loneliness (Heikkinen & Kauppinen, 2011; O'Lunaigh & Lawlor, 2008). In this study, mental health was measured via psychological distress, and this was the most important factor for loneliness in the analysis. Previous research has shown that lonely individuals are more likely than non-lonely individuals to perceive the world as threatening and may develop maladaptive behaviours that enhance the feeling of loneliness (cf. Cacioppo & Hawkey, 2009; Schoenmakers et al., 2015). In other words, the feeling of loneliness and psychological distress may reinforce one another (cf. O'Lunaigh & Lawlor, 2008).

The association between ADL limitations and loneliness changed significantly over time, with a weaker association in 2014 than in 2004. The extent to which physical functioning presents a barrier to social engagement is in part dependent on physical resources in the neighbourhood such as shops, service points, and barriers in the physical environment including hills and poorly maintained road surfaces (Honigh-de Vlaming et al., 2014; Phillips, Siu, Yeh, & Cheng, 2005; Smith, 2009). With more inclusive design and adaptations of existing

environments, people with functional limitations are offered more opportunities to stay socially active. The need for improvements of the physical environment has received attention internationally (e.g. United Nations, 2006; World Health Organization, 2007), and in Sweden a legislation has been passed stating that public areas should be accessible for all citizen (Prop. 1999/2000: 79). In so far as the legislation change has led to improvements in the physical environment, this may be part of the explanation of a weakening association between ADL limitation and loneliness in older people. A study conducted in the Netherlands has found, though, that loneliness had become more common amongst people with functional limitations over time (Honigh-de Vlaming et al., 2014). These contradictory findings suggest that further research is needed on the development of loneliness in older people with functional limitations.

4.1. Strengths and limitations of the study

This study is based on SWEOLD, which covers a relatively long study period and includes a broad range of variables, enabling an examination of trends in loneliness and its correlates over time. SWEOLD includes nationally representative samples of older people with high response rates in each wave of data collection. This means that the respondents were highly representative of the population, including frail and institution-based older people (see Lennartsson et al., 2014), although people who were too frail to be interviewed in person were not included in the analyses presented in this article. Given the association between loneliness and health problems, this may mean that this study underestimates the prevalence of loneliness among older people and may also affect the association between loneliness and health problems.

The repeated cross-sectional design of the present study means that no conclusions can be drawn regarding causal associations between loneliness and its correlates. Previous longitudinal research based on this data has shown, though, that social factors, such as marital status, social support and social contacts, and health-related factors are important predictors of loneliness (Dahlberg et al., 2015; Dahlberg, Andersson, & Lennartsson, in press).

A potential limitation of the study is that the modes of data collection varied across the data collection points. In 1992, 2002 and 2011 data was predominately collected *via* face-to-face interviews, and in 2004 and 2014 it was collected *via* telephone interviews. One could perhaps assume that the mode of data collection could influence self-disclosure and affect reported loneliness. However, there were no significant differences in reported loneliness across the main data collection modes, and *post hoc* analysis showed that trends in prevalence levels of loneliness were not significant even when controlling for data collection mode. Similarly, Victor, Scambler, Marston, Bond, and Bowling (2006) argue that reports of loneliness do not vary substantially with the data collection mode within the context of a structured questionnaire. However, previous studies comparing the effects on reported loneliness across different data collection modes have found mixed results (de Leeuw & Hox, 1993; van Tilburg & de Leeuw, 1991). In the present study, analyses of correlates of loneliness were made for two waves of data collection using the same main data collection mode, which rules out the possibility of any mode effect in these analyses.

5. Conclusions and practice implications

Contrary to what is often assumed, there has been no increase in loneliness among older people over the last two decades. Many older people who reported loneliness also experienced psychological distress. Loneliness and psychological distress may reinforce one another, and are also associated with other health problems. Work to prevent and reduce loneliness should therefore be of high priority. The importance of social factors for loneliness, shown in this study and previous

research, calls for efforts to support social integration and a sense of belonging. This could be done in the form of interventions and activities provided by formal care providers or voluntary organisations. Unfortunately, the evidence base for effective loneliness interventions is weak (Cohen-Mansfield & Perach, 2015) and there is no specific framework guiding practitioners in how to prevent loneliness (De Jong Gierveld & Fokkema, 2015). Still, it has been recommended that interventions should be targeted at specific groups (Cattan, White, Bond, & Learmouth, 2005). Our study and previous research, has found that widows and widowers are particularly vulnerable to loneliness.

Work to prevent and reduce loneliness among older people who are in receipt of care could also be undertaken as an integrated part of already existing services, such as home help or residential care. The Swedish Social Service Act states that social services should support older people in leading an active life together with other people. However, with enhanced economic pressure, local authorities in Sweden have introduced stricter guidelines and raised the thresholds for services, thus concentrated their resources on older people with larger rather than smaller care needs (Szebehely & Trydegård, 2012). An ambition to prevent or reduce loneliness within existing services would require that social and psychological needs are fully acknowledged and that the currently dominating priority of physical and medical needs over social needs in care services (National Board of Health & Welfare, 2010) is reconsidered.

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Conflict of interest

The authors declare that they have no conflict of interest.

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