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*Author: Glenn Sandström, PhD Associate professor*

Research Affiliate, Centre for Demographic and Aging Research, Umeå University

and Research Affiliate, Stockholm University Demography Unit (SUDA), Stockholm University

and Research Fellow, Department of Historical, Philosophical and Religious Studies, Umeå University,

Sweden , E-mail: [glen.sandstrom@umu.se](mailto:glen.sandstrom@umu.se)

*Author: Fredinah Namatovu, PhD postdoc, Centre for Demographic and Aging Research, Umeå University*

*Author: Jens Ineland, PhD, Associate professor, Department of Education, Umeå University*

*Author: Daniel Larsson, PhD, Associate professor, Department of Sociology, Umeå University*

*Author: Nawi Ng, PhD, Professor, Department of Public Health and Clinical Medicine, Umeå University*

*Author: Mikael Stattin, PhD, Associate professor, Department of Sociology, Umeå University*

## **The persistence high levels of single living among adults with disabilities in Sweden 1993-2011**

### **Introduction**

Partnering is one of the most central life course events that marks the shift from youth to adult life as it is a vital part of the social construction of independent adulthood in Western contemporary societies (Clarke and McKay 2014). This shift in the life course of young individuals is however a choice that is constrained by the possibility to meet and attract a suitable partner. Existing studies on family structure and union formation from a number of Western countries find a strong negative association between disability status and the probability to enter marriage or cohabitation (Hui Liu and Zhenmei Zhang 2013; MacInnes 2011; Savage and McConnell 2016; Tumin 2016). Additionally, studies of the impact of disability on family dynamics consistently find a lower probability to become a parent among people with disabilities (Clarke and McKay 2014; Franklin 1977; Olsen and Clarke 2003; Morris and Wates 2006). A number of studies find that people with disabilities also are more likely to experience separation and divorce (Clarke and McKay 2014; Savage and McConnell 2016; Singleton 2012). In Sweden there has been very limited studies on the impact of disability on family behavior in general and in particular on partnering and living arrangements. The few studies that exists are focused on the subjective experience of people with disabilities living in institutional arrangements as opposed to those living independently (Paulsson and Ringsby Jansson 2008) or give descriptive accounts (Häll and Skjöld 2003).

**The aims** of this study is to (a) investigate how disability is associated with the probability to live alone in Sweden, (b) to show to what extent this has changed in the recent decades that are characterized by extensive political reforms and introduction of disability right legislation in Sweden and, (c) to investigate whether there are differences in subjective rating of quality of life among those that live alone versus those that cohabit for people with and without disabilities. The reason to focus on how disability is associated with living alone is that singlehood is an indicator of an adult individual's access to various forms of social support and possibilities for resource and risk pooling.

## **Background and rationale**

We know from previous research that health outcomes and access to social support are negatively associated with living alone. Scholars have reported that married people have better physical health, psychological well-being and lower mortality compared to individuals that are single, divorced, separated or widowed (Carr & Springer, 2010; Chung & Kim, 2014; Koskinen, Joutsenniemi, Martelin, & Martikainen, 2007; Ross, Mirowsky, & Goldsteen, 1990; Simon, 2014). The protective effect of marriage on health and well-being is in part explained by the emotional and economic support provided by the partner (Dafoe & Colella, 2016; Ross, et al., 1990). Entering senior years as a single individual can function as disadvantage, both in terms of health and in terms of economic resources, as there are no partner present that one can pool resources with (Tamborini, 2007). Among people with disabilities, marital status is one of the most significant predictors of life satisfaction together with factors such as financial status, self-esteem and health status (Kinney and Coyle, 1992).

There has been several attempts to establish a link between disability and singlehood. The theory of assortative mating/homogamy is used to explain the high prevalence of singlehood among people with disabilities. This theory suggests that high resource individuals tend to partner with individuals having similar status and resources. In recent decades there is also a growing tendency for couples with high levels of education and income to exhibit lower levels of separation and divorce compared to individuals with a low socioeconomic resources. This tendency has increased in Scandinavian countries in recent decades as indicated by a shift to a positive socio-economic gradient in fertility and marriage and a negative gradient with divorce/separation (Goldscheider et al. 2015; Esping-Andersen and Billari 2015). In disability research these kinds of assortative mechanisms in the partner market have been characterized as “Disablist beliefs” where potential non-disabled individuals discard people with disabilities as potential partners (Savage and McConnell 2016 Crawford and Ostrove 2003; Kalliantes and Rubenfeld 1997; O’Toole 2002; Robillard and Fichten 1983). Another mechanism proposed as an explanation for the positive association between disability and living alone is opportunity constraints in terms of limited social participation, which reduces the possibilities of meeting potential partners. Studies from the Great Britain show that only 29% of those with physical disabilities age 15-17 years had been on a date as compared to 75% of the adolescents without disabilities (Anderson et al. 2002). In Sweden qualitative studies on women with disabilities from different generations find that disability results in strong constraints to finding a sexual partner, especially one that is not disabled themselves (Helmius, 1999). Moreover, potential non-disabled individuals can fear being caught up in a constraining caregiving role when entering a relationship with a partner with disabilities (Savage and McConnell 2016; Fiduccia 2000; Gill 1996).

Previous studies on family status amongst people with disabilities, have interpreted higher levels of divorce, singlehood and childlessness among people with disabilities as an indication of social exclusion rather than being a result of differences in preferences between people with and without disabilities (Franklin, 1977; Singleton, 2012; Clarke and McKay 2014; Savage and McConnell, 2015; Tumin, 2016). This assumption is supported by a number of studies that have failed to find any significant differences in the preferences regarding family formation and cohabitation among people with and without disabilities, leading to the conclusion that differences in family outcomes primarily can be explained by the lack of social integration and an inability among people with disabilities to

participate in the partner market on an equal footing with people without disabilities (Arnold and Chapman 1992; Emerson et al. 2008; Nosek et al. 2001).

## **Disability right legislation in Sweden**

Given that family outcomes can be regarded as an indicator of social integration of people with disabilities, the continuity or change in family behavior of this group is of interest in light of the extensive policy efforts undertaken in recent decades in Sweden to increase the integration of disabled in society. Since the 1960s the concept of normalization has been a key concept and “conceptual banner” (Tössebro, 2016, p. 112) in Swedish disability policy, setting the stage for deinstitutionalization and dedifferentiation in service provision (Ineland, 2016). To ensure that all citizens have access to the same level and quality of education, services and medical care, the state has certain responsibilities such as enacting social policies, laws and general welfare policies.

Sweden's disability policy is influenced by the United Nations Convention on the Rights of Persons with Disabilities, CRPD (United Nations, 2007). CRPD was ratified by Sweden 2008 and obligates states to ensure access to a range of support services, including personal assistance necessary to support living and inclusion in the community, and to prevent isolation or segregation from the community (*ibid.*). In recent years, disability policy have strongly emphasized active citizenship and how public policy through redistributive and regulatory measures, enables citizens with disabilities to maintain security through social rights, personal autonomy, and influence in public deliberation and decision-making processes (Halvorsen, et al., 2017; Sépulchre, 2018). The development is partly a response to citizens' demands to increased self-determination and greater autonomy over decision-making for support in the community instead of in state-based service provision (cf. van Toorn & Soldatic, 2015).

## **Disability pension in Sweden**

An important part of the public support systems for people with disabilities in Sweden is the disability pension/benefit program. This social security scheme provide income support to working age people with long term limitations in their working capacity due to ill health. Work disability is defined in relation to incapacity to perform normal work tasks (Jönsson, Palme, & Svensson, 2010). Eligibility criteria have during the past 30 years been continuously tightened. Today, only medical reasons are recognized as grounds for granting the benefit and the incapacity are expected to last for the foreseeable future. Given the increasingly narrowed eligibility to disability benefits, the inflow in the program have decreased considerably. During the 1990s between 40- and 60 000 disability pension benefits was granted annually. Most of these also received a full time benefit and under the assumption that they would be unable to return to the labor market. Today this figures has decreased to 10-15 000 (<https://www.forsakringskassan.se/statistik/sjuk/sjuk-och-aktivitetsersattning/aldre-statistik>). One consequence of the increasingly stricter eligibility to disability benefits is that disability pension recipients over time as a group typically has less good health.

The number of individuals receiving personal assistance increased rapidly after the introduction of the LSS/LASS laws in 1994 and reached approximately 10,000 individuals in 1996. Although the increase tapered off somewhat it continued unabated up until in 2011 when it reached approximately

20,000 individuals. Since then the inflow and outflow into the system have stabilized and the number of persons receiving support have in practice remained unchanged (Government Board of Health and Welfare 2015: 17).

Although it is clear that there has been an extensive expansion of policies and support systems in Sweden since the 1990s it is unclear if the living arrangements of people with disabilities have changed in any significant way since the introduction of these reforms. Similarly to Sweden improvement in disability right legislation have been implemented in recent decades in the US in terms of the Americans with Disabilities Act. In a study on US data for the period 1997-2013, Tumin (2016) concluded that despite considerable improvements in disability rights legislation and increased political activism advocating the integration of people with disabilities in society, disparities in marriage rates have increased rather than decreased between individuals with and without disabilities in the US. Tumin also finds that the probability of people with disabilities to be in a union with a non-disabled partner also have decreased during the same period, indicating that the tendency for assortative mating where non-disabled are not inclined to enter a union with an individual with disability, and is more likely to divorce/separate from a person with a disability have increased in strength in recent decades.

## **Data and methods**

To assess how disability is associated with the probability to live alone in Sweden and to what extent the new rights legislation and improvements in support and personal assistance is associated with any changes in the share of people with disabilities that live alone, we used the Survey of Living Conditions (ULF/SILC). The ULF/SILC is conducted annually by Statistics Sweden, on behalf of Sweden's parliament, since the late 1970s. The panel has a cross-sectional and a longitudinal part. The survey covers several welfare areas, such as income, health, marital and family status, accommodation, employment and safety. The survey also includes in-depth modules (such as economy, labor market, health) implemented during different data collection waves, and repeated every eighth year.

The reason for choosing to use survey data in terms of the ULF/SILC rather than register data for the study is threefold. Firstly, Swedish registers are unable to correctly identify individuals living alone during the period 1991-2010 (Statistics Sweden 2003). For the period 1960-1990 information on household composition is available with 5-year intervals in the Population and Housing Censuses. But in the 1990s work was initiated to conduct a completely register-based census and the traditional census were postponed until 2011. The first register-based census was performed in 2011 when the Swedish Dwelling Register became operational and since then it is possible to one again follow individuals on the household level in the Swedish registers (Statistics Sweden 2013). However, for the period 1991-2010 all studies of household composition are constrained to use survey data to ascertain the living arrangement of individuals. The reason that it is not possible to use the register data to study who is living alone or not during the period 1991-2011 is that the registers only contain information on the building that the individuals are living in rather than the actual dwelling/apartment. This means that it is not possible to use the register data to link individuals together into households if they cohabit in an apartment building with more than one dwelling and they are unmarried and have no shared children. An extensive discussion of these limitations in the register data during the period 1991-2011 is provided by Statistics Sweden (2003), were they use

survey data to estimate the share of individuals that are incorrectly classified in the population registers in terms of their living arrangements. Therefore we use the self-reported information on the question if the person lives alone or not provided in the ULF-survey coded as a simple dichotomous variable. The misclassification in the registers for individuals that cohabit but are not married and do not have children is also evident when the self-reported ULF question is cross referenced with the information in the population register. Cross-referencing the self-reported information against the register data shows a very high correspondence where 99.6% of married individuals recorded as living in the same building also report that they cohabit in our survey data. The problem with the register data of not being able to link childless couples that cohabit is evident however as 41.6 percent of the cases recorded as living alone in the registers state that they actually are cohabitating with someone. We have chosen to trust the self-reported status over the register data because of the very small discrepancies between the self-reported information for individuals that have shared children and/or are married. The only case where the register data deviates from the self-reported information with more than a few fractions of a percent are the categories where the individual is living in the same building as their children when the child is older than 18 year of age. 7.5 % of all individuals stating that they live alone live in the same building as their adult children, presumably this is cases where the parent and adult child lives in separate apartments but in the same building which we know is not an entirely uncommon arrangement. Secondly, information on disability status in the registers of Statistics Sweden are limited to information on whether the individual receives disability pension. Although we find that disability pension is a good indicator for all-cause disability using the ULF/SILC-survey has the advantage that we are able to use self-reported indicators of disability status that can be contrasted to the one provided by the external assessment of disability status given by the social insurance agency that to some extent is subject to changes in legislation and implementation of the law.

Thirdly, another benefit of using survey data is that it contains much richer information than what can be drawn from register-based sources alone. For example, the ULF/SILC provides individual assessment of quality of life, how long the individual has been living alone, social support etc. which we can use to further contrast the living conditions of people with and without disabilities. .

There are 17,241 observations in the working data consisting of individuals in the age span 25-64 at the time of interview. These individuals participated in the ULF/SILC 1993–96 (wave 1), 2002–03 (wave 2) or 2010–11 (wave 3). Some of the individuals have participated in more than one wave of data collection which means that the number of individuals are less than 17,241 amounting to a total of 11,580 unique individuals. We use the data as cross sections of the population at the time of interview and do not consider the panel element in the data in terms of analyzing any changes within subjects over time. However, we do account for any potential clustering within subjects due to repeated measurements in our statistical analysis.

The first time of the interview, i.e. 1993–96, is used as the baseline. This period coincides with extensive expansion of public support to people with disabilities, in particular with the introduction of the LSS/LASS law – providing the right to personal assistance for individuals with disabilities. We expect that any effects of these reforms will occur with some lag and may occur throughout the period 1994-2011 (Government Board of Health and Welfare 2015: 17). Here, it is important to notice that the expansion of public support for people with disabilities does not concern disability

pension eligibility during the period. Disability pension regulation have become stricter over time, as mentioned in previous paragraphs.

To estimate the probability to be a one-person household dependent on the disability status while controlling for other demographic and socio-economic background characteristics in the different periods we use logistic regression. We code the living arrangement into a dichotomous variable of living alone vs. cohabiting and adjust for any within subject correlation across observations for the panel individuals by applying a clustered sandwich estimator of the standard errors. We also tested an alternative multi-level specification in terms of random intercept models that control for within subject unobserved heterogeneity. However, these models did not yield any substantive differences in the estimated probabilities and therefore we choose to present the simpler specification using a clustered sandwich estimator of the standard errors for matters of parsimony.

We linked the individual-level ULF/SILC data to the Longitudinal Integration Database for Labor Market Studies (LISA) at Statistics Sweden that includes rich information on socio-economic characteristics, labor market outcomes and dependence on different types of social insurance (Statistics Sweden 2016). This was used to get register-based information on socio-economic information, geographical context as well as information on one of our disability indicators in terms of the individual receiving disability pension or not. The variable was coded as a dichotomous indicator equal to one if the individual received any disability pension and zero otherwise. To contrast against the register-based definition of all-cause disability status that is based on the external evaluation of the social insurance agency [Försäkringskassan] we also use the indicator for moving disability that is available in the ULF/SILC. This indicator is set to one if the individual has answered “No” to the question “Can you run a distance of 100 meters if you are in a hurry”? and “No” to at least one of the additional questions: “Can you get on and off a bus (without assistance)” or “Can you take a shorter walk of 5-minutes at a fairly rapid pace”?

To control for socioeconomic differences we include both level of education and disposable income after taxation that includes gains and losses from dividends in the year of interview as defined in the LISA register. The disposable income was divided into percentiles based on the distribution of incomes in the age span 25-64 in the year in question. To control for contextual differences we include the type of municipality that the individual resides in at the time of the interview based on the classification provided by the Association of Swedish municipalities (2016). We use the highest aggregation level that separates between big cities of at least 200,000 inhabitants in the municipality which corresponds to Sweden's three largest cities Stockholm, Gothenburg Malmö and the surrounding municipalities that share the same labor market. Secondly, medium size towns with less than 200,000 down to 40,000 inhabitants and thirdly smaller towns with less than 40,000 inhabitants including rural municipalities that are sparsely populated.

## Results

Descriptive statistics for the disability indicators as well as all of the demographic and socio-economic variables included in the analysis for each period of observation are presented in Table 1. In total, we include 4712, 7574, and 4955 observations from 1993-1996, 2002-2003, and 2010-2011, respectively. Less than 20% of the individuals reported that they lived alone at the time of interview, and about 3% of them reported moving disability and about 9% of them had disability pension according to the register data.



**Table 1: Descriptive statistics**

	<b>ULF 1993-96</b> (N = 4712)	<b>ULF 2002-03</b> (N = 7574)	<b>ULF 2010-11</b> (N = 4955)	<b>Total</b> (N = 17241)
<b>Index person lives alone</b>				
No	3899 (82.7%)	6158 (81.3%)	4065 (82.0%)	14122 (81.9%)
Yes	813 (17.3%)	1416 (18.7%)	890 (18.0%)	3119 (18.1%)
<b>Has moving disability</b>				
No	4562 (96.8%)	7322 (96.7%)	4804 (97.0%)	16688 (96.8%)
Yes	150 (3.2%)	252 (3.3%)	151 (3.0%)	553 (3.2%)
<b>Has disability pension</b>				
No	4304 (91.3%)	6873 (90.7%)	4581 (92.5%)	15758 (91.4%)
Yes	408 (8.7%)	701 (9.3%)	374 (7.5%)	1483 (8.6%)
<b>Gender of respondent</b>				
Woman	2417 (51.3%)	3873 (51.1%)	2597 (52.4%)	8887 (51.5%)
Men	2295 (48.7%)	3701 (48.9%)	2358 (47.6%)	8354 (48.5%)
<b>5-year age-group</b>				
25-29	359 (7.6%)	936 (12.4%)	530 (10.7%)	1825 (10.6%)
30-34	446 (9.5%)	943 (12.5%)	594 (12.0%)	1983 (11.5%)
35-39	448 (9.5%)	901 (11.9%)	704 (14.2%)	2053 (11.9%)
40-44	463 (9.8%)	1020 (13.5%)	605 (12.2%)	2088 (12.1%)
45-49	806 (17.1%)	966 (12.8%)	686 (13.8%)	2458 (14.3%)
50-54	812 (17.2%)	987 (13.0%)	610 (12.3%)	2409 (14.0%)
55-59	731 (15.5%)	1036 (13.7%)	512 (10.3%)	2279 (13.2%)
60-64	647 (13.7%)	785 (10.4%)	714 (14.4%)	2146 (12.4%)
<b>Educational level (years)</b>				
Primary (-9)	1132 (24.0%)	1044 (13.8%)	486 (9.8%)	2662 (15.4%)
Secondary (-12)	2153 (45.7%)	3547 (46.8%)	2223 (44.9%)	7923 (46.0%)
Undergraduate (>15)	774 (16.4%)	1242 (16.4%)	834 (16.8%)	2850 (16.5%)
Graduate level (15-)	653 (13.9%)	1741 (23.0%)	1412 (28.5%)	3806 (22.1%)
<b>Income percentile</b>				
-20%	947 (20.1%)	1517 (20.0%)	983 (19.8%)	3447 (20.0%)
21-40%	941 (20.0%)	1518 (20.0%)	993 (20.0%)	3452 (20.0%)
41-60%	941 (20.0%)	1513 (20.0%)	993 (20.0%)	3447 (20.0%)
61-80%	944 (20.0%)	1517 (20.0%)	994 (20.1%)	3455 (20.0%)
81-%	939 (19.9%)	1509 (19.9%)	992 (20.0%)	3440 (20.0%)
<b>Type of municipality</b>				
Stockholm, Gothenburg,	1416 (30.1%)	2572 (34.0%)	1720 (34.7%)	5708 (33.1%)
Malmö				
City 40K-200K inhab.	1832 (38.9%)	2918 (38.5%)	1968 (39.7%)	6718 (39.0%)
Smaller towns and rural	1464 (31.1%)	2084 (27.5%)	1267 (25.6%)	4815 (27.9%)

**Source:** Survey of living conditions ULF/SILC and Longitudinal Integration Database for Labor Market Studies (LISA) 1993-96, 2002-03, 2010-11

Table 2 and 3 presents the living arrangement of individuals with and without disability assessed based on presence of moving disability (Table 2) and disability pension (Table 3) at the three survey periods. In Table 2, the proportions of individuals with moving disability who lived in single member households were consistently higher than those of individuals without moving disability, i.e. 27.3%, 27.0% and 31.1% vs. 16.9%, 18.4% and 17.5% in 1993-1996, 2002-2003, and 2010-2011, respectively. The proportion of individuals with moving disability who lived in a nuclear family with children were also relatively constant during the three surveys, ranging from 23.3% in 1993-1996 to

26.5% in 2010-2011 while the proportion among non-disabled was almost twice as high ranging from 42.4% to 44.6%. In general there is no substantial of increase in family formation among people with disabilities, but rather some signs of the opposite in terms of moderate increases of individuals living alone from 27% in 1993-96 to 31% in 2010-11 and a decrease of individuals cohabiting with people that were not their parents, siblings or their one children from approximately 43% in 1993-96 to 33% in 2010-11. The persistent pattern is over time is the much higher proportion of living alone among people with disabilities compared to non-disabled.

**Table 2: Living arrangements by ULF-years and disability status, relative frequencies in percent**

<b>Household status</b>	<b>Reports moving disability</b>					
	ULF 1993-96		ULF 2002-03		ULF 2010-11	
	No	Yes	No	Yes	No	Yes
<i>Living with parents and/or siblings</i>	1.1	2.0	1.4	1.6	1.4	2.0
<i>Nuclear -no children</i>	34.6	42.7	30.7	38.1	29.2	32.5
<i>Nuclear</i>	42.4	23.3	42.2	24.6	44.6	26.5
<i>Single w. children</i>	4.6	4.0	6.6	8.3	6.2	6.6
<i>Single</i>	16.9	27.3	18.4	27.0	17.5	31.1
<i>Other</i>	0.3	0.7	0.6	0.4	1.0	1.3
<b>Total</b>	100	100	100	100	100	100

**Source:** Survey of living conditions ULF/SILC and Longitudinal Integration Database for Labor Market Studies (LISA) 1993-96, 2002-03, 2010-11

**Table 3: Living arrangements by ULF-years and disability pension, relative frequencies in percent**

<b>Household status</b>	<b>Has disability pension</b>					
	ULF 1993-96		ULF 2002-03		ULF 2010-11	
	No	Yes	No	Yes	No	Yes
<i>Living with parents and/or siblings</i>	1.1	2.0	1.4	1.6	1.4	1.9
<i>Nuclear -no children</i>	33.3	51.2	29.9	41.8	28.0	44.7
<i>Nuclear</i>	44.2	16.2	44.0	19.0	46.3	17.1
<i>Single w. children</i>	4.7	3.4	6.7	6.3	6.3	5.3
<i>Single</i>	16.4	26.7	17.5	30.5	16.9	31.0
<i>Other</i>	0.3	0.5	0.6	0.9	1.1	0.0
<b>Total</b>	100	100	100	100	100	100

**Source:** Survey of living conditions ULF/SILC and Longitudinal Integration Database for Labor Market Studies (LISA) 1993-96, 2002-03, 2010-11

Table 3 describes the living arrangements of individuals receiving disability pension compared to those that do not. Using this indicator we observe quite similar patterns of living arrangements. Of those who received disability pension in 1993-1996, over half (51.2%) reported living in nuclear family with no children, 26.7% lived in single member households, and 16.2% lived in nuclear family with children. In contrast, the majority of individuals who did not receive disability pension lived in nuclear family with children (44.2%) in the same period, 33.3% lived in nuclear family without children and only 16.4% lived alone. During the two decades, the proportion of individuals who lived in nuclear family without children decreased among those receiving disability pension (from 51.2% to 44.7%) and those who did not (from 33.3% to 28.0%). The proportions of those living

alone were quite stable among those who did not receive disability pension, but among those who received, it increased moderately from 26.7% in 1993-1996 to 31% in 2010-2011.

In sum the descriptive findings do not indicate any increase in family formation among people with disabilities during the period under investigation regardless of the indicator used. If anything we observe modest increases in the share of people with disabilities living alone during the period 1993-2011 from approximately 27% in 1993-96 to 31% in 2010-11 and a more pronounced decrease of those cohabitating with non-relatives with no children in the household.

Table 4 shows logistic regression models for the probability to live alone dependent on disability status while controlling for any changes in the demographic and socio-economic composition for people with and without disabilities over time including significant interactions as well as a test of possible changes in the effect of disability over time through an interaction between the disability status and survey period.

Using either moving disability or received disability pension as proxies of disability, we observed a significant association between disability and a higher probability to live alone among individuals aged 25-64 years old in Sweden, after controlling for potential confounders. The adjusted effect size of receiving disability pension on living alone was slightly higher than that of moving disability (odds ratio of 2.05,  $p<0.001$  vs. 1.87,  $p<0.01$ ). Although the descriptive findings in Table 2-3 do show modest increases of people with disabilities living alone the regression models that adjust for compositional changes in the population of people with disabilities show no evidence of a significant change in the effect of disability status over time emphasizing the tendency for a persistent positive association between disability and the probability to live alone.

Regarding the other variables included in the model the gender and age are by far the most influential variables showing strong associations with the probability to live alone. Men have approximately 6.6-7.1 times higher adjusted odds ratio to live alone compared to women. However, regarding the impact of disability this is slightly lower among men than among women, as seen in the negative interaction effect of disability status for men, which is also significant in the case of men with disability pension. Accounting for the interaction the odds ratio of to live alone among men with disability pension is 1.50 compared to 2.05 among women controlling for the other variables in Model 2. But it is important to note that when comparing men and women with disability, disabled men are still more likely to live alone than disabled women, due to the strong relationship between male gender and the probability to live alone. The estimated probability to live alone for men with disability is on average  $p=.28$  while it is only  $p=.25$  for women although the influence of the disability status is lower for men than for women. Other groups with a higher probability to live alone are individuals younger than 35 and older than 45, men with low incomes, women in the higher income quintiles and individuals living in large metropolitan areas in Stockholm, Gothenburg, and Malmö compared to their mid aged counterparts, low income women, and those who lived in cities, smaller town and rural areas.

**Table 4: Logistic regressions of living alone by moving disability and disability pension for individuals aged 25-64**

Variable		Model 1	Model 2
<b>Has moving disability</b>		□□□	□□□
	No	(base)□□	
	Yes	1.87**□	□
<b>Has disability pension</b>		□□□	□
	No	□□□	(base)□□□
	Yes	□□□	2.05***
<b>Survey year</b>		□□□	□
	ULF 1993-96	(base)□□□	(base)□□□
	ULF 2002-03	1.06□□□	1.02□□□
	ULF 2010-11	1.02□□□	1.00□□□
<b>Survey year * Moving disability</b>		□□□	□□□
	ULF 1993-96 * Yes	(base)□□□	□□□
	ULF 2002-03 * Yes	0.93□□□	□□
	ULF 2010-11 * Yes	1.22□□□	□□□
<b>Survey year * Disability pension</b>		□□□	□□□
	ULF 1993-96 * Yes	□□□	(base)□□□
	ULF 2002-03 * Yes	□□□	1.15□□□
	ULF 2010-11 * Yes	□□□	1.24□□□
<b>Sex of respondent</b>		□□□	□□□
	Woman	(base)□□□	(base)□□□
	Man	6.64***	7.10***
<b>Man * Moving disability</b>		□□□	□□□
	Men*Yes	0.75□□□	□□□
<b>Man * Disability pension</b>		□□□	□□□
	Men*Yes	□□□	0.73*□□
<b>5-year age-group</b>		□□□	□□□
	25-29	5.43***	5.77***
	30-34	2.41***	2.50***
	35-39	1.10□□□	1.13□□□
	40-44	(base)□□□	(base)□□□
	45-49	1.79***	1.77***
	50-54	3.04***	2.95***
	55-59	4.75***	4.52***
	60-64	5.54***	4.92***
<b>Man * Age-group</b>		□□□	□□□
	Men * 25-29	0.45***	0.44***
	Men * 30-34	0.78□□□	0.77□□□
	Men * 35-39	1.01□□□	0.99□□□
	Men * 40-44	(base)□□□	(base)□□□
	Men * 45-49	0.64*□□	0.65*□□
	Men * 50-54	0.39***	0.40***
	Men * 55-59	0.28***	0.29***
	Men * 60-64	0.21***	0.22***
<b>Educational level (years)</b>		□□□	□□□
	Primary (-9)	(base)□□□	(base)□□□
	Secondary (-12)	0.96□□□	0.99□□□
	Undergraduate (>15)	0.92□□□	0.97□□□
	Graduate level (15-)	0.98□□□	1.03□□□

**Table 4 continued.....**

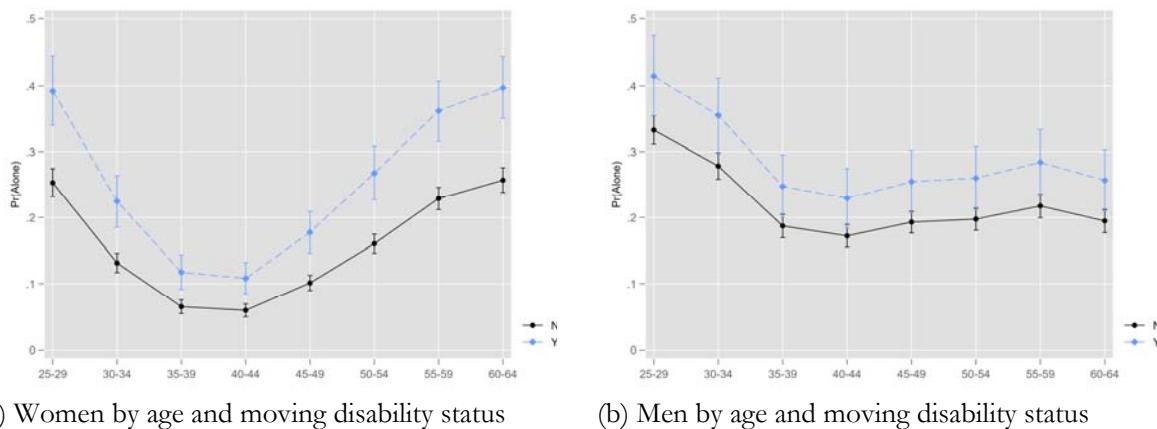
Income percentile		□□□	□□□
-20%	(base)□□□	(base)□□□	(base)□□□
21-40%	1.13□□□	1.21*□□	1.65***
41-60%	1.47***	1.66***	1.66***
61-80%	1.47***	1.58***	1.58***
81-%	1.38**□	1.38**□	1.38**□
Man * Income percentile		□□□	□□□
Men * -20%	(base)□□□	(base)□□□	(base)□□□
Men * 21-40%	0.58***	0.56***	0.56***
Men * 41-60%	0.41***	0.39***	0.39***
Men * 61-80%	0.30***	0.28***	0.28***
Men * 81-%	0.22***	0.20***	0.20***
Type of municipality		□□□	□□□
Stockholm, Gothenburg, Malmoe	(base)□□□	(base)□□□	(base)□□□
City 40K-200K inhab.	0.70***	0.68***	0.68***
Smaller towns and rural	0.67***	0.64***	0.64***
Man*Type of municipality		□□□	□□□
Men * Stockholm, Gothenburg, Malmoe	(base)□□□	(base)□□□	(base)□□□
Men * City 40K-200K inhab	1.26*□□	1.29*□□	1.29*□□
Men * Smaller towns and rural	1.05□□□	1.08□□□	1.08□□□
N	17241□□□	17241	17241

\* p<.05; \*\* p<.01; \*\*\* p<.001

**Source:** Survey of living conditions ULF/SILC and Longitudinal Integration Database for Labor Market Studies (LISA) 1993-96, 2002-03, 2010-11

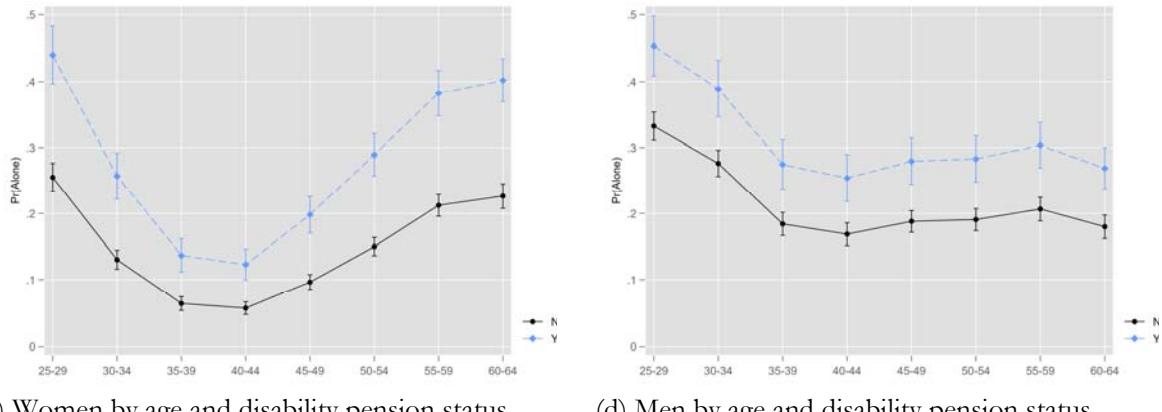
In Figure 1, we show the estimated probabilities to live alone by age and disability status for men and women respectively. From Figure 1 it is clear that individuals with disability exhibit consistently higher probabilities to live alone compared to the general population without disability, especially among the younger age group (before the stage of family formation) and in the age span 45-65. These effects were more prominent among older women compared to older men.

**Figure 1:** Probability to live alone for men and women aged 25-64, 1993-2011 by moving disability and disability pension status



(a) Women by age and moving disability status

(b) Men by age and moving disability status

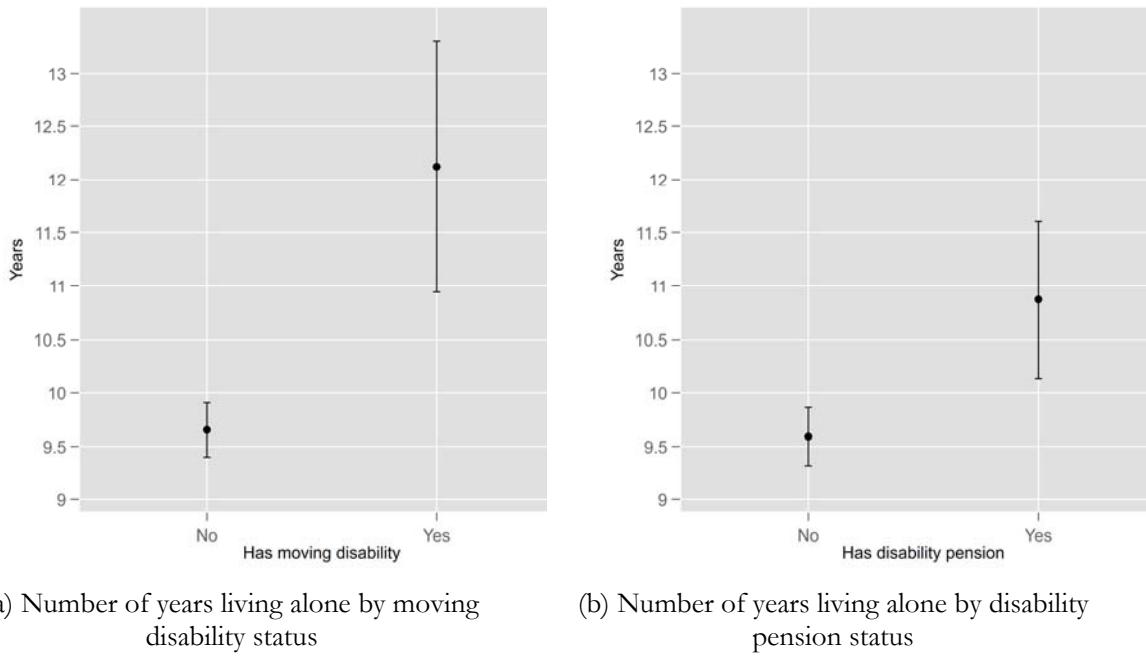


**Source:** Survey of living conditions ULF/SILC and Longitudinal Integration Database for Labor Market Studies (LISA) 1993-96, 2002-03, 2010-11

### Differences in the duration of single living

In the surveys conducted in 1993-96 and 2002-03 the respondents were asked how long they had lived alone if they lived in a one person household at the time of interview. In Figure 2 we present OLS-regression estimates of the predicted mean number of years that the respondent states that he/she has been living alone prior to the interview dependent on their disability status. Both individuals with moving disability and disability pension report having been in this living arrangements for a significantly longer period of time compared to individuals without disability that also lives alone. This indicates that people with disabilities living alone tend to experience longer spells of being a one person household than individuals without disability and that there likely is an over representation of individuals that have never cohabitated in the group having disabilities. The data does not allow us to differentiate between these two alternative causes for the higher mean time living alone among people with disabilities. But likely both longer spells and a higher proportion of never coupled individuals among people with disabilities contribute to the association.

**Figure 2:** Mean number of years living alone individuals aged 25-64, 1993-2003 by moving disability and disability pension status



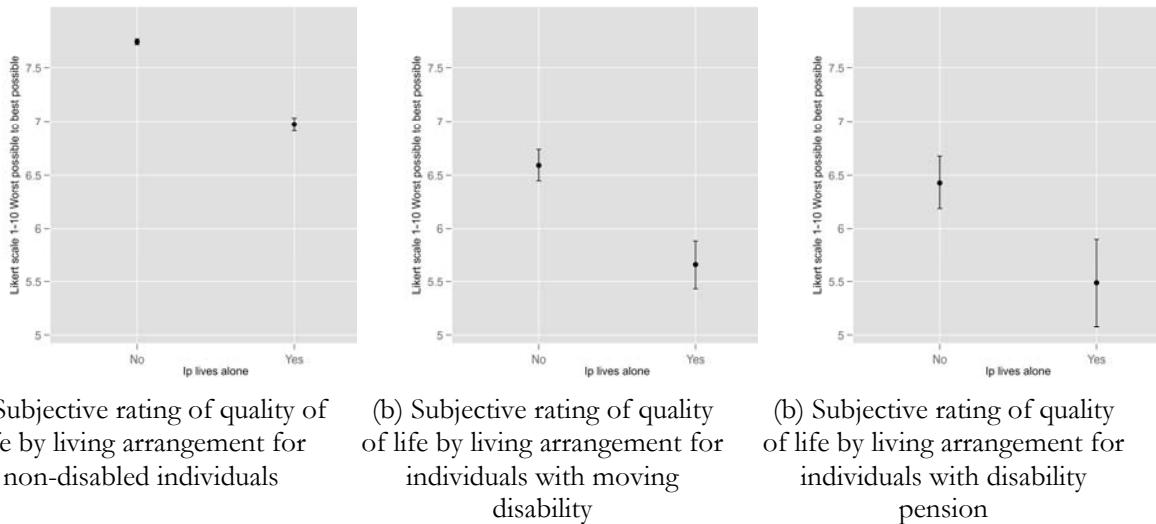
**Source:** Survey of living conditions ULF/SILC and Longitudinal Integration Database for Labor Market Studies (LISA) 1993-96, 2002-03

**Note:** Measure is adjusted for age, sex, period, education, income and municipality type

### Differences in the subjective rating of quality of life

In Figure 3 we switch to the subjective rating of quality of life among those that live alone versus those that cohabit for people with and without disabilities. In this case the respondents are asked to rate their overall quality of life on a scale from 1 (Worst possible) to 10 (Best possible). This question is unfortunately also only available for the two first periods 1993-96 and 2002-03. Non-disabled people who lived alone reported statistically significant lower quality of life compared to those who cohabit (Figure 3, panel a). Individuals with disability, either measured based on self-reported moving disability (Figure 3, panel b) or disability pension (Figure 3, panel c) reported a substantially lower quality of life compared to non-disabled individuals, and the contrast between those who lived alone and those who did not remained. The results indicate that both living alone and disability status are independently associated with the individual's tendency to report a lower quality of life and that people with disabilities living alone are those that on average report the lowest quality of life compared to non-disabled that cohabit.

**Figure 3:** Subjective rating of quality of life from worst possible (1) best possible (19) among individuals aged 25-64 living alone compared to cohabiting, 1994-2003, by disability status



**Source:** Survey of living conditions ULF/SILC and Longitudinal Integration Database for Labor Market Studies (LISA) 1993-96, 2002-03

**Note:** Measure is adjusted for age, sex, period, education, income and municipality type

## Concluding discussion

The purpose of our study was to investigate whether disability is associated with the probability to live alone and assess the extent to which this has changed in the recent decades following the disability rights legislation for social integration of individuals with disability in Sweden. The results of this study suggest that people with disabilities aged 25-64 years old are significantly more likely to live alone compared to non-disabled. Further our results show that people with disabilities experience longer periods of living as a one person household and that both their single status and disability is associated with them reporting a lower quality of life compared to non-disabled and those that cohabit. This study found no evidence of an increase in family formation and parenthood among people with disabilities during the two decade follow-up. In general men had significantly higher adjusted odds to live alone but the increase in the probability to live alone for people with disabilities was slightly stronger for women than for men. Individuals with disabilities reported much lower quality of life compared to their non-disabled counterparts and the negative association between quality of life assessment and living alone is at least as large among disabled as non-disabled individuals. This indicates that it is unlikely that the higher proportions of living alone and longer spells of living in a one person household can be explained by a difference in preferences where disabled to larger extent chooses to live alone. Rather it is likely that these patterns reflect a disadvantage of disabled individuals in the partner market and that people with disabilities are less successful in forming partnerships that can lead to cohabitation and family formation. Additionally, the policy efforts implemented since the 1990s to include people with disabilities into society do not appear to have changed this disadvantage. The strong link between disability status and living alone revealed by this study is in line with findings reported by earlier studies (MacInnes, 2011; Savage &

McConnell, 2016; Tumin, 2016) and suggest that people with disabilities are presented with less opportunities to meet a potential partner. Some previous studies of family status amongst people with disabilities have tied the higher levels of singlehood and childlessness to social exclusion (Jamieson, Wasoff, & Simpson, 2009). This could be due to disablist beliefs where potential non-disabled partners do not consider people with disabilities as potential partners (Savage and McConnell 2016; Crawford and Ostrove 2003). Swedish qualitative studies on women with disabilities find that disability results in strong constraints to find a sexual partner, especially one that is not disabled themselves (Helmius, 1999) a conclusion that is reinforced by the quantitative findings of this study showing about twice as high levels of single living among adults with disability as in the non-disabled population while controlling for other demographic, socioeconomic and contextual influences known to influence living arrangements. Several studies find that adolescents with disabilities have normative expectations, they expect and want to enter into cohabiting relationships and start a family of their own (Arnold & Chapman, 1992; Bernert, 2011). Internalization of negative messages received by people with disabilities during childhood concerning their potential to assume the roles as partners or parents, negatively impact their future views on partnership and parenthood according to this research (Olsen and Clarke, 2003; Sherry, 2003). It is likely that the higher incidence of living alone found in this study among people with disabilities reflects constraints working against the possibility to find a suitable partner.

We report no significant changes in the levels of people with disabilities entering unions either as cohabiting parents or in unions with no children during the past two decades. We expected some decrease in the difference in union formation between people with disabilities and non-disabled considering that since the 1990s Sweden introduced reforms with extensive policies and support systems aimed at improving the participation in society. The finding of this study implies persistent difficulties in navigating family dynamics and living arrangements experienced by people with disabilities despite political reforms. A persistence of high levels of single living among individuals with disabilities is possibly due to the fact that political reforms primarily have been implemented within the institutional framework of service provision focusing on living environment, occupation and increased autonomy and as such did not directly address family dynamics. Interestingly, a US study for the period 1997-2013 notes that despite improvements in disability rights legislation and increased political activism advocating for the integration of the disabled in society, disparities in marriage rates continued to increase rather than decrease between disabled and non-disabled (Tumin, 2016).

Our study showed that men had significantly higher adjusted odds to live alone compared to women, although disability increased the probability to live alone slightly more for women than for men. However, the higher baseline risk among men compared to women means that overall also men with disabilities are more likely to live alone than women with disabilities. This finding is in line with evidence from recent studies in Europe (Jamieson, et al., 2009). In an attempt to explain increased solo living among men, the role of men's economic uncertainty in the postponement of marriage is highlighted (Oppenheimer, 1988). This view is especially relevant in the context of solo living among men with disabilities due to the strongly negative effect of income on the probability to live alone among men, receipt of disability pension directly implies being unemployed and exiting the

labor market, which increases economic constraints. A UK study reported that subgroups of economically disadvantaged young men faced delay in transitions to partnership (Stone, Barrington, & Falkingham, 2011). Moreover, the probability to end up in a one person household after separation rather than being left as a single parent is likely higher for men than women which partly explains the higher rates among men with and without disabilities in the age groups when family formation is most prominent between age 35-45 during which women exhibit much lower probabilities to live alone than men. Nevertheless, solo living among men with disabilities could have potential implications related to the male gender and to disability. The observed reduced life satisfaction among those living alone compared to coupled individuals was at least as strong among people with disabilities as those without disabilities. Disability and living alone might both lower life satisfaction because of other related constraints including socio-economic disadvantage. Lower life satisfaction among people with disabilities rises important health questions as life satisfaction is associated with beneficial health outcomes, including mental wellbeing (Bellis et al., 2012) and longevity (Collins, Glei, & Goldman, 2009; Wiest, Schuz, Webster, & Wurm, 2011).

In conclusion, the results of this study show that working age adults with disabilities in Sweden are approximately twice as likely to be living alone compared to individuals without disabilities. People with disabilities were also more likely to report low life satisfaction and this was especially true among individuals living alone with disabilities. Although Sweden has worked extensively on social inclusion and to reduce inequalities for people with disabilities some of these differences still persist. Because people with disabilities are more prone to social isolation there is a need for further research to clarify the direct and indirect pathways leading to this association. If abilities to form and sustain family relationships is viewed as an important aspect of social inclusion, future research focusing on why policy appears to be unable to directly influence family outcomes amongst people with disabilities would be welcome.

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