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Self-reported activity limitations among the population aged 20–79 in Estonia: a cross-sectional study

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Background: Along with population ageing, limitations in activities of daily living constitute a rising health-related burden in demographically advanced countries. The present study aims to assess the prevalence of self-reported activity limitations derived from chronic conditions and social variation of limitations in the subgroups of the population aged 20–79 years in Estonia. **Methods:** A cross-sectional study employs data from the second round of the Estonian Family and Fertility Survey, a national project in the framework of Gender and Generation Programme. The target population covers age groups of 20–79 years. A nationally representative probability sample was drawn from the 2000 population census. Face-to-face interviews ($n=7855$) were conducted in 2004–05. **Results:** The estimated prevalence of activity limitations with chronic conditions is 18.5% (95% CI 17.6–19.4) and the prevalence of severe limitations is 10.6% (95% CI 9.9–11.3) among the population. The logistic regression model shows significant differences in activity limitations associated with age, educational attainment and marital status. **Conclusions:** Judging from our results and the EU structural indicators on health, the prevalence of activity limitations derived from chronic conditions is comparatively high in Estonia. The measures to prevent activity limitations and disability should receive a higher priority in Estonia.

Keywords: activity limitations, chronic conditions, disability, Eastern Europe, Estonia, social variation

Introduction

The modern demographic trends, in particular the rise in life expectancy and ageing of the population, have played a major role in launching a new approach to health which recognizes the salience of physical and mental functioning as well as social participation.¹ Since the onset of epidemiological transition, the increase in life expectancy implied a concurrent improvement in the health of the population. In recent decades, this is not necessarily the case because chronic diseases have replaced communicable diseases and the risk of ill health is not solely linked to the risk of dying.²

The differentiation between the various dimensions of population health led to a debate about the expansion or compression of morbidity.^{3,4} Answering these questions calls for attention to activity limitations and participation restrictions which currently constitute a substantial health-related burden worldwide.⁵ The international standard to describe and measure these phenomena has been developed by the World Health Organization.^{6,7} According to its current revision, the International Classification of Functioning, Disability and Health (ICF), disability is seen not as merely 'medical' or 'biological' dysfunction but rather a process that involves three levels: (i) body functions and structure; (ii) activities at the individual level, from simple to complex; and (iii) participation in society. In this framework, functioning and disability are conceived as dynamic interactions between health conditions and contextual factors.

In the public health context, activity limitations are considered the most reliable predictors of disability, which

relate to the risk of hospitalization, admission to long-term care, sheltered housing, etc.⁸

In this article, our aim is to assess the prevalence of self-reported activity limitations, their types and severity and the association with a set of socio-demographic variables among the population aged 20–79 years in Estonia. From a comparative perspective, Estonia is among the countries that have experienced a remarkably long stagnation in population health in recent decades. Judging from mortality indicators, the progress ceased in the 1960s and it took >30 years until the upward trend in life expectancy resumed only in the late 1990s.⁹ In 2005, when the bulk of the FFS data was collected, life expectancy at birth was 78.1 years for females and 67.3 years for males in Estonia. With these figures, Estonia ranked fifth and third from the bottom, respectively, among the EU-25 countries.¹⁰ Against this background, there is little research available on the health status of the population in the country, as measured by the spread of activity limitations. Although the topic has been included in the programme of several surveys carried out since the beginning of the 1990s, the spread of activity limitations has not been analysed in much greater detail.^{11,12}

The results can be used for the identification of population groups at risk and informing the health and social policy about the need for better integration of these groups. In a broader framework, the study is expected to enhance the knowledge of the situation in the eastern part of Europe with respect to the spread of activity limitations.

Methods

Study design

The data for this study come from the second round of the Estonian Family and Fertility Survey (FFS), carried out in the context of the UNECE Gender and Generations Programme.¹³ The survey applies the life course approach and contains retrospective event histories on major life careers, including family formation, childbearing, education, work and residential mobility.

The survey was based on a nationally representative probability sample of the resident population of Estonia. The target population comprised of men and women born between 1924 and 1983, i.e. 20- to 79-year olds at the beginning of 2004. Following the general practice of the programme, women were oversampled. The selection of cases from the sampling frame (2000 population census) was performed using the one-stage random procedure. In case the respondent failed to complete the interview, the procedure foresaw matched substitution from the census database, controlling for the key characteristics of non-respondent (gender, age, nativity and geographic location). The sample comprised 11 192 individuals, of whom 4334 were men and 6858 women. The weights introduced after the data collection correct for oversampling of women and the non-response.

Data collection procedure

The period of the fieldwork lasted from September 2004 until June 2005, with the bulk of interviews conducted in the latter year. The data were collected by a team of trained interviewers ($n=120$), under the supervision of the Estonian Interuniversity Population Research Centre by means of face-to-face interviews. The participation in the survey was voluntary. The interviews were conducted in two languages (Estonian or Russian), the average duration of the interview was 99 min.

Of the 11 192 eligible respondents, 5034 female respondents and 2821 male respondents were interviewed. The overall response rate was 70.2%, being somewhat lower for males. The most common reasons for non-response were refusals (15.9%) and non-location (10.2%); all other reasons accounted for 3.7% of the eligible respondents. Detailed information on the survey procedures is available in the methodological report and standard tabulations.^{14,15}

Measurements

The measurements of activity limitations and participation restrictions are drawn from the health module of the Estonian FFS. The main purpose of this module was to include health among the domains addressed in the survey and to obtain a more complete account of the life trajectories and their interplay. Central to this goal is the assessment of health conditions that limit the activities and social participation of the respondents.

The underlying life course framework did not allow a straightforward implementation of instruments that have been developed for health interview surveys, based on cross-sectional design.^{16–18} Also, the latest guidelines for health interview surveys were not yet available in 2003 when the FFS questionnaire was developed.

The measurement of self-reported activity limitations was relied on two questions addressed to all respondents: 'Have you ever had any injuries that seriously limited your work, studies or daily activities for three months or longer?' and 'Have you ever had any long-term illnesses or health disorders that seriously limited your work, studies or daily

activities for three months or longer?'. These questions capture the cumulative incidence of injuries and illnesses/health disorders that led to activity limitations among the respondents, lasting for at least 3 months. If the answer to either of the above questions was positive, several follow-up questions were asked concerning the characteristics of each reported trauma/illness (type, time of incidence, duration of activity limitation and medical certification of disability).¹⁹

The current prevalence of activity limitations can be judged from the follow-up question 'Does this injury/long-term illness still limit your work, studies or daily activities today?' A positive answer to this question was used to identify the respondents with any kind of current activity limitation derived from chronic conditions. To get further insight into the profile of activity limitations, those who reported having limitations at the time of the survey were presented a list of 13 items to specify the profile of their restrictions (table 1). These items can be linked to the following chapters of the ICF on activity and participation: d3 Communication, d4 Mobility, d5 Self-care, d6 Domestic life, d7 Interpersonal interactions and relationships, d8 Major life areas and d9 Community, social and civic life. For each item, the respondents rated the severity of the restriction on a scale of 4 grades (1 = 'not limited at all', 2 = 'somewhat limited', 3 = 'strongly limited', 4 = 'impossible').

Variables

Our main outcome variable measures the current prevalence of activity limitations derived from chronic conditions. The information is derived from the questions described above and pertains to respondents who reported an activity limitation at the time of the survey, resulting from a certain injury or disease.

The specification distinguishes between two levels of the outcome variable. The first level refers to overall prevalence irrespective of the severity of activity limitations. The second level considers only severe limitations, comprising respondents who rated their ability 'strongly limited' or 'impossible' for at least one item in our list of 13 activities. The distinction between these two levels was made by several reasons. First, there is evidence that the prevalence of the moderate and severe limitations may be relatively independent of each other, sometimes even the trends may be opposite at different levels.²⁰ Second, researchers have pointed to the heterogeneity of overall prevalence indicators, which often bring many insignificant conditions along with it.²¹ Third, an explicit link between activity limitations and underlying chronic conditions assumed in the FFS was expected to lead to an understatement of the prevalence of less severe limitations. The comparison of our results to other surveys based on the GALI (Global Activity Limitation Indicator), which does not assume such a direct link, confirmed this assertion as shown later in the article. Finally, separate attention to severe limitations is justified owing to its greater role in determining the quality of life of individuals.

To analyse the variation in the prevalence of activity limitations with chronic conditions, our independent variables include gender, age, type of settlement, educational attainment, marital status and nativity. All these variables are included among the background characteristics recommended by the Eurostat Working Group on Public Health Statistics for the European Health Interview Survey.²² These characteristics have been found significant as the correlates of health outcomes in various contexts, including Estonia.^{23–25}

Table 1 Total and item-specific prevalence of activity limitations, Estonia, age groups of 20–79 years

Type of limitation	Men (n = 2821)		Women (n = 5034)		Total (n = 7855)	
	All limitations, % (95% CI)	Severe limitations, % (95% CI)	All limitations, % (95% CI)	Severe limitations, % (95% CI)	All limitations	Severe limitations
Total (from 13 items)	18.6 (17.2–19.9)	10.2 (9.1–11.2)	18.5 (17.3–19.7)	11.0 (10.0–11.9)	18.5 (17.6–19.4)	10.6 (9.9–11.3)
1. Communication	4.1 (3.5–4.8)	1.2 (0.9–1.6)	4.9 (4.2–5.5)	1.7 (1.3–2.1)	4.6 (4.1–5.0)	1.5 (1.3–1.8)
Listening radio/doorbell	1.6 (1.2–2.0)	0.4 (1.2–0.6)	1.7 (1.3–2.1)	0.5 (0.3–0.7)	1.7 (1.4–1.9)	0.4 (0.3–0.6)
Reading/watching TV	3.0 (2.4–3.6)	0.9 (0.6–1.3)	4.3 (3.7–4.9)	1.4 (1.0–1.8)	3.7 (3.3–4.2)	1.2 (0.9–1.4)
Speaking	1.5 (1.1–1.9)	0.3 (0.1–0.5)	1.4 (1.0–1.7)	0.4 (0.2–0.6)	1.4 (1.2–1.7)	0.3 (0.2–0.5)
2. Mobility	12.9 (11.8–14.0)	5.6 (4.8–6.3)	15.2 (14.1–16.3)	7.2 (6.4–8.0)	14.1 (13.4–14.9)	6.5 (5.9–7.0)
Sitting and standing up	5.8 (5.0–6.6)	1.3 (0.9–1.7)	8.2 (7.4–9.0)	2.2 (1.8–2.7)	7.1 (6.6–7.7)	1.8 (1.5–2.1)
Moving around outside home	10.5 (9.5–11.5)	4.1 (3.4–4.8)	12.9 (11.9–14.0)	5.1 (4.4–5.7)	11.8 (11.1–12.6)	4.6 (4.2–5.1)
Walking up and down stairs	10.2 (9.1–11.2)	4.1 (3.5–4.8)	12.7 (11.7–13.8)	5.7 (5.0–6.4)	11.6 (10.8–12.3)	5.0 (4.5–5.5)
3. Self-care	6.2 (5.4–7.0)	1.9 (1.4–2.3)	6.9 (6.1–7.7)	2.1 (1.7–2.5)	6.6 (6.0–7.1)	2.0 (1.7–2.3)
Using toilet	3.4 (2.7–4.0)	1.0 (0.7–1.3)	4.0 (3.4–4.6)	0.9 (0.6–1.2)	3.7 (3.3–4.1)	1.0 (0.7–1.2)
Dressing	4.5 (3.8–5.2)	1.0 (0.7–1.4)	5.0 (4.3–5.6)	1.2 (0.9–1.5)	4.8 (4.3–5.2)	1.1 (0.9–1.4)
Eating	2.8 (2.3–3.4)	0.5 (0.3–0.7)	3.2 (2.7–3.8)	0.9 (0.6–1.2)	3.0 (2.6–3.4)	0.7 (0.5–0.9)
4. Domestic life						
Performing housework	11.1 (10.1–12.2)	3.7 (3.0–4.3)	13.7 (12.7–14.8)	4.0 (3.4–4.6)	12.5 (11.8–13.3)	3.8 (3.4–4.3)
5. Interpersonal interactions and relationships						
Socialising with friends	5.8 (5.0–6.6)	1.6 (1.2–2.0)	7.6 (6.8–8.4)	2.4 (1.9–2.8)	6.8 (6.2–7.3)	2.0 (1.7–2.3)
6. Major life areas						
Studies and work	15.3 (14.1–16.5)	8.7 (7.8–9.7)	15.1 (14.0–16.2)	8.0 (7.1–8.8)	15.2 (14.4–16.0)	8.3 (7.7–8.9)
7. Community, civic and social life						
Communication with public institutions	8.0 (7.1–8.9)	3.5 (2.9–4.1)	9.4 (8.5–10.3)	4.1 (3.5–4.8)	8.8 (8.2–9.4)	3.8 (3.4–4.3)

Statistical analysis

The analysis of activity limitations is structured in two parts. In the first part, the spread of activity limitations with chronic conditions is examined by means of prevalence rates for all and severe limitations. The profile of activity limitations is examined, based on the ICF chapters and our list of 13 activities. Along with the prevalence rates, the 95% confidence intervals are presented.

In the second part, multivariate logistic regression models are applied to explore the association between the outcome variable and covariates. Covariates in the model include gender, age, type of settlement, education, marital status and nativity; an adjustment was performed simultaneously for all covariates. Results from models are presented in terms of adjusted odds ratios, with significance levels associated with them. All analyses used weighted data that matches the age-sex structure of the resident population of Estonia.

Results

Prevalence of activity limitations

The overall prevalence of activity limitations with chronic conditions is presented in table 1. The prevalence rate combining moderate and severe limitations amounts to 18.5%. This means that nearly one in five people aged 20–79 years currently living in Estonia experiences some sort of restriction in daily activities. The prevalence of severe limitations that impose strong restrictions or make certain activities impossible appears noticeably lower, accounting for 10.6%. Across gender the prevalence of limitations appears fairly similar.

The respondents who reported an activity limitation with chronic conditions at the time of the survey were asked to specify the type of restriction by means of 13 items. To provide an insight into the profile of activity restrictions, table 1 also presents the prevalence for each individual item. The items are grouped according to the domains of the International Classification of Function, Disability and Health. Communication, mobility and self-care were

represented by more than one questionnaire item. For these domains, an additional measure was introduced to summarize the prevalence of activity limitations pertaining to particular domain.

With regards to the total population, activity limitations are most frequently related to studies and work, with prevalence rates amounting to 15.2% for all and 8.3% for severe limitations, respectively. This comes at no surprise since both studying and working include complex activities that are mentally and/or physically demanding. Mobility-related limitations were reported by 14.1% of the respondents and severe limitations by 6.5%. Mobility was followed by domestic activities, and participation in community, civic and social life. Of the respondents, 12.5% and 8.8% reported limitations in these two domains and the prevalence of severe restrictions was reported by 3.8%. For the remaining three domains, the prevalence appears somewhat lower.

The data in table 1 reveal that the sum of item-specific prevalence rates (92% for all limitations and 34% for severe limitations) markedly exceeds the overall prevalence of activity limitations. This implies that chronic conditions usually limit activity in several domains at the same time. On average, the respondents who reported that their performance is limited due to chronic conditions marked 5.1 activities from our list of 13 items. Only 11% of the respondents with activity limitations considered themselves limited in a single activity. The noticeably high prevalence of multiple restrictions suggests that our measurement instrument has identified a core of the population group, which is limited in their daily activities due to chronic conditions. This assertion is supported by the proportion of respondents with medically certified disabilities. Of the respondents with activity restrictions in our survey, 53% had a certified disability. Among those with severe limitations, the corresponding proportion accounts for 68%.

The item non-response was fairly low, ranging between 0.4% and 0.8% for most items, appearing somewhat higher only for speaking (1.8%).

Figure 1 presents the age pattern for all and severe activity limitations with chronic conditions. The increase in the

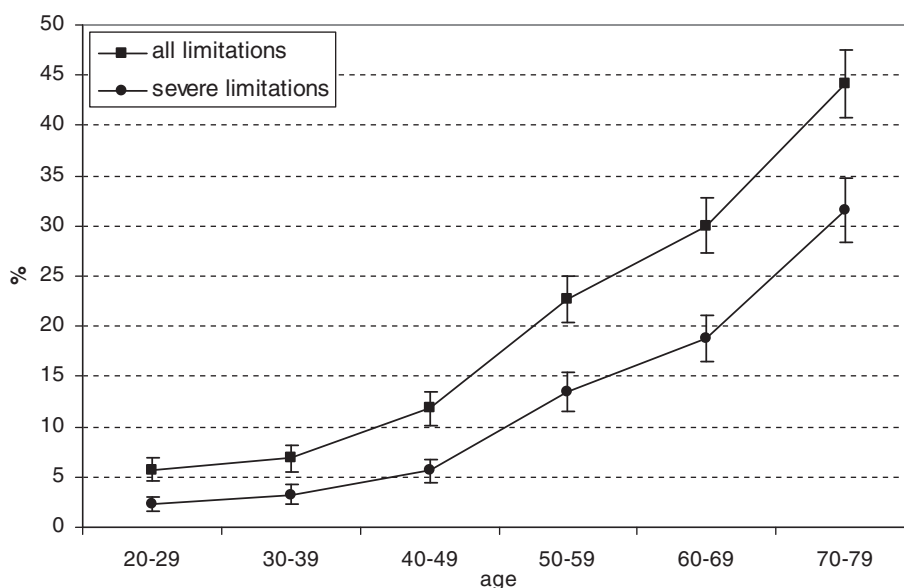


Figure 1 Prevalence of activity limitations, Estonia, age groups of 20–79 years

Table 2 Age-adjusted prevalence rates and model estimates of activity limitations, Estonia, age groups of 20–79 years

	Number of respondents	All limitations		Severe limitations	
		Age-adjusted prevalence rate, % (95% CI)	AOR (95% CI)	Age-adjusted prevalence rate, % (95% CI)	AOR (95% CI)
Age	7855	na	1.05 (1.05–1.06)**	na	1.06 (1.06–1.07)**
Gender					
Men	2821	19.2 (17.8–20.5)	1.00	10.8 (9.7–11.8)	1.00
Women	5034	17.2 (16.0–18.3)	0.87 (0.76–0.99)*	10.1 (9.1–11.0)	0.92 (0.78–1.09)
Type of settlement					
Urban	5505	16.4 (15.4–17.4)	0.79 (0.69–0.91)**	9.5 (8.7–10.3)	0.85 (0.71–1.02)
Rural		22.3 (20.6–24.0)	1.00	12.5 (11.2–13.9)	1.00
Education					
Primary	1827	29.3 (27.2–31.5)	1.82 (1.58–2.11)**	18.0 (16.2–19.8)	1.90 (1.59–2.27)**
Secondary	4659	16.5 (15.4–17.5)	1.00	9.0 (8.2–9.8)	1.00
Higher	1369	11.1 (9.4–12.8)	0.62 (0.50–0.75)**	5.4 (4.2–6.6)	0.55 (0.41–0.72)**
Marital status					
Single	828	24.0 (21.1–26.8)	1.77 (1.41–2.24)**	16.2 (13.7–18.6)	2.34 (1.75–3.14)**
Married/cohabiting	5090	16.4 (15.3–17.4)	1.00	9.1 (8.3–9.9)	1.00
Widow(er)	872	17.4 (14.7–20.1)	1.11 (0.92–1.35)	9.6 (7.6–11.7)	1.04 (0.83–1.31)
Divorced/separated	1065	22.6 (20.0–25.2)	1.64 (1.38–1.96)**	13.5 (11.3–15.6)	1.81 (1.46–2.25)**
Nativity					
Native	5597	19.1 (18.1–20.2)	1.00	10.8 (10.0–11.6)	1.00
Foreign origin	2258	16.0 (14.5–17.6)	0.90 (0.77–1.05)	9.6 (8.4–10.9)	0.99 (0.82–1.19)

Adjusted odds ratios (AOR) and 95% CI for daily activity limitations derived from the models including age in years, gender, type of settlement, education, marital status and nativity.

Nativity here distinguishes between the native population of Estonia (mainly ethnic Estonians) and the foreign-origin population (post-war immigrants from various parts of the former Soviet Union and their descendants).

Significance: * $P < 0.05$; ** $P < 0.01$

prevalence rates is relatively slow in younger age groups but accelerates noticeably after the age of 50 years. In the oldest age group of 70–79 years, 44.2% of the population experienced activity limitations and 31.5% had developed severe limitations. The comparison of the two age profiles indicates that the increase in the overall prevalence of activity limitations is mainly driven by the rise in severe limitations. In the three oldest 10-year age groups, which account for >two-thirds of all reported activity limitations, the prevalence of severe limitations increased from 13.5% to 31.5%, while the prevalence of moderate limitations only rose from 9.2% to 12.7%.

Differentials in activity limitations

Table 2 presents the variation in the prevalence of activity limitations with chronic conditions across a set of socio-demographic characteristics. The strong association between age and activity limitations is corroborated by the multivariate framework. Across gender, our results suggest that women feature a lower likelihood of limitations than men, but the difference is fairly small. For severe limitations, it does not reach statistical significance at the 0.05 level.

With regard to settlement type, the likelihood of activity limitations with chronic conditions is somewhat lower among the urban population. For all restrictions, the odds of

having a health-related activity limitation appear 21% lower than among rural residents. With respect to the prevalence of severe limitations, the difference is smaller and below the level of statistical significance.

The strongest difference in activity limitations is associated with educational attainment. People who have not completed secondary education featured 80–90% higher risk of activity limitations than those with a secondary school diploma. Tertiary education brings along a further reduction in the odds of having activity limitations, for severe limitations the odds ratio is 45% lower than for the reference category. All differences related to education are statistically significant.

Marital status also makes a relatively strong difference in the likelihood of activity restrictions with chronic conditions. Being single or divorced/separated is associated with an increased risk of activity limitations. For a single person, the odds of having activity limitation with chronic conditions exceed the reference category (married or cohabiting) 77% for all limitations and 134% for severe limitations. For divorced/separated, the increase in odds ratios accounts for 64% and 81%, respectively. Among widows, the risk is not significantly different from that in the reference category.

Foreign-origin population (post-war immigrants and their descendants) does not demonstrate worse health outcomes with respect to activity limitations, and the difference from the native population is below the level of statistical significance.

Discussion

According to our study, 18.5% of the Estonian population aged 20–79 years experience some limitations in their daily activities, derived from chronic conditions that developed earlier in the life course. The prevalence of severe limitations was reported among 10.6% of the population.

We compared our results with those of the EU-SILC and the Estonian Health Interview Survey (EHIS), both conducted in 2006.^{26,27} Both surveys followed the European Health Interview Survey guidelines and asked the respondents to what extent they were limited because of a health problem in activities they usually do. Three answer categories distinguished between 'severe', 'not severe' and 'no limitations'.¹⁷ For the age groups 20–79 years, the proportion of respondents with severe limitations range from 8.7% in the EU-SILC to 11.3% in the EHIS, the FFS with its 10.6% is positioned in the middle. As regards all limitations, the FFS (18.5%) underestimates the prevalence compared with the EU-SILC (34.9%) and the EHIS (36.8%). This likely underreporting of less serious conditions may be due to the data collection instrument, but requires further research to identify factors that may have contributed to it. In view of the disease burden, however, the prevalence rates reported in our study should not be regarded low as they relate to conditions that have prevailed over fairly long segments of the respondents' life course. On average, the duration of activity limitations accounts for 5.7 years among males and 6.7 years among females in the FFS.¹⁴

To place our results into the wider context, we rely on the measure of healthy life years, which combines the survey data on the prevalence rates of activity limitations and the mortality data.^{28,29} Eurostat has produced these measures drawing on the EU-SILC for the EU member states. For 2005, when the bulk of the FFS data was collected, both Estonian men and women featured the lowest healthy life expectancy (with neither severe nor less severe limitations) among the EU member states.¹⁰ A similar conclusion can be drawn from a recent cross-national study that focused on healthy life

expectancy (with neither severe nor less severe limitations) at the age of 50 years.³⁰ With regard to the proportion of years lived with severe limitations, on which the results of our survey (10.6%) and the EU-SILC (8.7%) were fairly consistent, Estonian men ranked fifth and Estonian women ranked sixth from the worst end. The latter means that the relatively poor ranking of the country stems not only from the low life expectancy but also to an equal extent from the relatively high prevalence of activity limitations.

Although shaped by the health conditions, the implications of activity limitations stretch well beyond the boundaries of the health sector. In the context of population ageing, remaining active longer in life forms a necessary condition for ensuring sustainable economic growth. For the member states of the European Union, the Lisbon strategy aims to increase the employment rate of older workers to 50% by 2010. According to the FFS, 47% of the age group 55–64 years were employed in Estonia, but the data reveal significant differences associated with the health status. The respondents with no reported activity limitations featured the employment rate of 57%. Among those with moderate limitations, the proportion of employed was 38%; severe limitations brought employment rate down to 11.5%. From this viewpoint, the reduction in the prevalence of activity limitations could make an essential contribution to achieving the Lisbon objectives.

The inability to perform some key activities may lead to dependency—the need for help (or care) beyond the customary level required by a healthy adult person. The evidence from the FFS suggests that in Estonia activity limitations are translated into a considerable amount of support provided within households. On average, 14% of the respondents reported having a household member who is in the need of regular assistance due to health reasons.¹⁴ The percentage rises towards older age groups, reaching 35% in the age group 70–79 years. Against that background, the supply of formal support is relatively limited as only 10% of those receiving help reported that it is provided by a formal carer (e.g. social worker).³¹ Studies from other settings have demonstrated that high-intensity caring tends to be associated with restricted social and economic opportunities, and the risk of detrimental effects on the mental and physical health of the carer.³²

In terms of policy implications, our results suggest that measures to prevent activity restrictions and disability should receive higher priority in Estonia. These measures should not be targeted at older population among whom the prevalence of activity limitations reaches the highest levels but to people in younger age and mid-life. From the life course perspective, the prevalence of activity limitations is associated with the rate of decline in functional capacity following its natural peak in early adulthood. The high prevalence of limitations likely reflects the fact that chronic diseases occur at a relatively early age. In this context, policies fostering healthy lifestyle choices are particularly important in postponing the onset of activity limitations.³³

Our study also reveals a noticeable variation in the prevalence of activity limitations with chronic conditions between subgroups of Estonian population, with the largest differences that are associated with educational attainment and marital status. Both variables have been found to make a significant difference in health outcomes in other settings.^{34,35} By the same token, differentials related to education and marital status corroborate with earlier findings on mortality, self-reported health, morbidity, health-related behaviour and health care utilization in Estonia.^{36–38} Unlike in previous studies, we found no significant difference in the prevalence of activity limitations between the native and foreign-origin

population in Estonia.³⁸ This may be partly due to the use of other outcome measures (e.g. mortality) in the previous studies but calls for further investigation of the issue.

Our results point to the existence of sizeable inequalities, which have become an increasingly important concern for health policies since the 1990s. Their relevance is expressed in the targets formulated by the European Office of the World Health Organization.³⁹ These targets state that by the year 2020, the health gap between socio-economic groups should be reduced by at least one-fourth in all member countries. Against that background, focusing on the disadvantaged groups may be essential for successfully improving the population's health in Estonia. In order to be effective, however, specific health interventions should be coupled with broader welfare policies.

The limitations of the current study arise from the cross-sectional approach that does not allow us to establish a causal relationship or a direction of causality for differentials in activity limitations. In addition, there is the potential for selection bias related to the non-participation in the survey due to the ill health/severe activity limitations that might attribute to the underestimation of the activity limitations prevalence. Last, but not least, we found the measurement instrument to be a plausible reason for underreporting of less severe activity limitations. In a broader framework, this underlines the importance of employing totally harmonized data collection instruments in the study of activity limitations.

To conclude, our study revealed a relatively high prevalence of activity limitations derived from chronic conditions in Estonia and the risk appears significantly elevated among the more disadvantaged social groups.

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Key points

- This cross-sectional population study is the first to address the prevalence of daily activity limitations in Estonia.
- The prevalence of activity limitations derived from chronic conditions is comparatively high in Estonia, with the implications stretching beyond the boundaries of the health sector.
- There is a noticeable social variation in the prevalence of activity limitations between subgroups of the population, with the largest differences associated with educational attainment.
- The measures to prevent activity limitations should receive a higher priority in Estonia. Special focus on the disadvantaged groups may be essential for successfully improving the population health.

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