Health inequalities among older adults in Sweden 1991–2002

Stefan Fors¹,², Carin Lennartsson¹, Olle Lundberg³

**Background:** Current research has shown a decline in health among older adults in Sweden. This study examines health inequalities among older adults in Sweden in 1991–1992 and 2000–2002 and explores the development of these inequalities during this period. Methods: A data set was constructed out of four levels of living surveys, comprising 4085 individuals aged 55 and above. Multivariate logistic regressions were used to assess the association between social class, sex, age and four different domains of self-reported health: global self-rated health, impaired mobility, musculoskeletal pain and psychological distress. Adjustments were made for period of interview. Interaction terms were also used to assess change over time. Levin’s attributable risk was used to assess the magnitude of the health inequalities. Results: The results indicate an increase in reports of all specific health problems, but not in the global health measure during the period. Significant sex differences and a clear social gradient in health were discernible during both periods. Women were more likely than men to report problems with impaired mobility, pain and psychological distress. Manual workers were significantly more likely than non-manuals to report problems in all four domains of health. However, both the sex differences and the social gradient seemed to remain constant during the period. Conclusion: Although it seems there are significant differences in health depending on sex and social class among older adults in Sweden, these inequalities appear to be unaffected by the general increase in ill health that has been observed in these groups over the last decade.

**Keywords:** health inequalities, health trends, older adults, Sweden

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Research on socioeconomic differences in health has consistently shown a social gradient in morbidity and mortality. Individuals with lower socioeconomic positions tend to have poorer health and die at younger ages.¹,² Such associations have been observed over an extended period of time in several European countries,³–⁷ including Sweden.⁸–¹¹

Even though most studies on health inequalities have focused on the young and the middle aged, an increasing number of studies now show that socioeconomic inequalities in health prevail into later life.¹²–²¹ It has even been suggested that socioeconomic status has an effect on the biological process of aging itself, leading to more severe cell attrition among individuals with low socioeconomic status than among their peers with higher socioeconomic status.²²–²⁴

However, traditionally, research has shown that health inequalities, at least in relative terms, tend to decrease in the higher ages.²⁵ But, since relative inequalities refer to the ratio of rates of ill health in one group to the rates of another group, and since this ratio is sensitive to the levels of the rates, an increase in the absolute levels of poor health is per se likely to yield a decrease in the relative inequalities. Thus, small relative inequalities among older adults may well reflect a heavier burden of disease in terms of reduced functional abilities or mortality if the number of cases generated by socioeconomic inequalities is increasing. Hence, analyses of trends in absolute and relative inequalities among older persons are of interest.

Results from studies on socioeconomic health inequalities among the young and the middle aged have not shown any significant changes in the magnitude of the social gradient in health during the 1990s.⁶,²⁶,²⁷ On the other hand, several studies have suggested a considerable decline in several domains of health among the older population in Sweden since the 1990s,²⁸–³⁰ possibly as a result of increased rates of survival among older people with longstanding illness.²⁹ However, the effect that these increases in general prevalences might have had on health inequalities in these age groups is as yet unknown.

Similarly, research on gender inequalities in health among older people has revealed paradoxical associations. Women tend to report higher levels of morbidity than men, but they also have a greater life expectancy.³¹ However, the gender gap in life expectancy narrowed in Sweden during the 1990s.³² Less is known about how the gender differences in morbidity developed in these groups during this period.

In sum, we would argue that there is a need for an analysis of trends in socioeconomic and gender inequalities among older adults. In order to address this, we aim to: (i) explore health inequalities in several health domains among older adults, aged 55 and older in Sweden and (ii) to analyse whether any changes in these health inequalities has occurred between 1991–1992 and 2000–2002.

To achieve this aim, a couple of issues have to be considered. First, health inequalities can be studied both in terms of absolute and relative inequalities. If, as some studies have suggested, ill health has increased in the oldest age groups, then the absolute levels of inequality, that is the actual number of individuals affected, could increase even if the relative differences remain unchanged. In this study, health inequalities are studied in terms of absolute differences in prevalence rates of ill health, as well as in terms of relative inequalities.

Second, studies on health inequalities have been based on a wide array of different indicators of socioeconomic position, income, education and occupation-based measures perhaps being the most common. In this article, we use a measure of...
social class based on present occupation among those still active in the labour force and primary lifetime occupation among those who are retired. While it has been argued that occupation-based measures of social position are of less relevance for older people since most of them have left the labour force, several studies have shown occupational-based measures to be highly associated with health and mortality among older adults in Sweden. The reason for this is that social class is not primarily a measure of occupational risks, but an indicator of the position in a social structure. The position in this social structure is not lost simply because people leave paid employment—rather the differences in life chances, opportunities and resources are carried over to life as a pensioner. Moreover, some studies have suggested that the Nordic countries have been more successful in reducing health inequalities associated with income than suggested that the Nordic countries have been more successful in reducing health inequalities associated with income than

- Poor self-rated health is based on the question: How do you view your general state of health. Is it good, poor or in-between? In this study, the variable is dichotomized in order to separate those reporting their health to be poor from those reporting their health to be good or in-between. In interviews, where this question has been excluded due to the use of a proxy, the respondent has been classified as having poor self-rated health. Since proxies are used to a great extent when direct interviews are impractical due to failing health, this should constitute a reasonable substitution.

- Impaired mobility is measured by two self-assessed mobility items (ability to walk 100 m and ability to walk up stairs, without difficulties). Respondents reporting difficulties with either or both of these items were coded as having impaired mobility.

- Musculoskeletal pain is measured by an index. The question: Have you had any of the following illnesses or ailments during the last 12 months? were followed by a list of specific health problems, three of which concern musculoskeletal pain: in the shoulders, back, hip or sciatica, and hands, elbows, legs or knees. For each item, the given answers were No, Yes, mild problems, or Yes, severe problems. In creating the index, the answers were coded as 0 (No), 1 (Yes, mild problems), or 3 (Yes, severe problems). The index was dichotomized, separating those with a score of 3 or higher (at least three mild problems, or one severe problem) from those with a lower score.

- Psychological distress is measured by an index similar to the index measuring pain. The index was constructed from five psychological items from the list mentioned earlier: general fatigue, having difficulties sleeping, nervous problems, depression/deep sadness, and mental illness. However, due to the inherently severe nature of mental illness, the answers regarding mental illness are coded as 0 (No), or 3 (Yes, mild problems, or Yes, severe problems). This type of index measuring psychological distress has been used in several studies and has been shown to predict mortality.

In this study, socioeconomic position is measured using socioeconomic classification (SEI) based on occupations and the typical skills needed for these occupations. This type of measure of socioeconomic class is theoretically well underpinned, often used in international comparative studies of stratification and health inequalities and available in Swedish statistics.

SEI classification draws on the length of education typically required and typical trade union membership. Position in the organization (employed/self-employed) and size of organization is also taken into consideration. As both the occupation of the respondent and his or her spouse is known, a single class position is assigned for the whole household. This is done according to an order of dominance, as described by Erikson, based on the assumption that some positions have a greater impact on the living conditions, values and behavioural patterns of a household than others, i.e. they are dominant. Thus, the positions of the spouses are compared and the dominant position is then used for both spouses. This selection is done according to an order of dominance: positions with higher qualifications dominate positions with lower qualifications, where qualifications are equal non-manual positions dominate manual positions. Furthermore, the self-employed dominate the employed (with the exception of employed professionals) and the employed dominate the unemployed. In this study, the positions are divided into four different classes: Higher and medium non-manual workers, Lower non-manual workers, Manual workers and Farmers & Self-employed.

Methods

Data

The study is based on the Swedish Level of Living Surveys (LNU) from 1991 to 2000 and the Swedish Longitudinal Study of Living Conditions of the Oldest Old (SWEOLD) surveys from 1992 to 2002. LNU is a longitudinal study originally conducted in 1968, consisting of a nationally representative sample of Swedes between the ages of 15 and 75. The study was repeated in 1974, 1981, 1991 and 2000, with new recruitment of younger individuals and immigrants in order to maintain a representative sample. It should be noted, however, that the representativeness refers to the gross sample. Even though analyses of the respondents shows representativeness regarding age and gender, one can not totally exclude the possibility that selection biases among the non-respondents could skew the representativeness of the net sample.

SWEOLD is a continuation of the LNU. The SWEOLD sample consists of all persons from the LNU sample who have reached the age of 75 or above. The sample is representative on a national level and comprises institutionalized as well as community-dwelling persons. Proxy interviews were conducted when direct interviews were not possible due to poor health or cognition.

For the purpose of this study, a data set was constructed consisting of respondents aged 55–75 from the LNU studies of 1991 and 2000, and all the respondents from the 1992 and 2002 SWEOLD studies. The response rate for respondents aged 55–75 in LNU was 73.1% in 1991 and 72.7% in 2000. The response rate in the SWEOLD studies was 95.4% in 1992 and 84.4% in 2002. In the analyses, the data is divided into two cross-sectional periods, the first period comprising the 1991 LNU study and the 1992 SWEOLD study, and the second period comprising the 2000 LNU study and the 2002 SWEOLD study.
As shown in table 1, there have been some changes in the class structure of the population between the two waves of measurements. The proportion of Higher and intermediate non-manuals comprised about 27% of the population in 1991–1992 and almost 37% of the population in 2000–2002. During the same period, the proportion of Manual workers decreased from 40% to 32% of the population. In order to assess the effect of such changes in the class structure, as well as to estimate the extent of the societal burden of the health inequalities, Levin’s attributable risk (LAR) was calculated for the different health problems at both points of time. LAR estimates the proportion of ill health that would be eliminated if all social classes had the same levels of ill health as the most privileged class.

As a result of the sampling procedure, 1103 individuals were interviewed during both periods. Intra-individual correlations could subsequently lead to erroneously low standard errors, and correspondingly, to confidence intervals which were too narrow. The Huber–White sandwich estimator of variance, with correction for clustering of observations, has been used in the multivariate analyses to control for this.

## Results

The first step of the analyses is to explore the prevalence of reported ill health in the different groups during both periods, as shown in table 2. Overall, the results demonstrate a significant increase in reports of impaired mobility, pain and psychological distress in 2000–2002. In contrast, there has been no increase in the levels of poor self-rated health. Moreover, the levels of poor self-rated health are considerably lower than the levels of reported problems in the other health domains, suggesting that poor global self-rated health is not simply a sum of various specific health and functional problems, but an evaluation of these problems for older persons perception of their health.

Women report more problems with improved mobility, musculoskeletal pain and psychological distress than men. The increased prevalence or reported problems in these health domains is only significant for women.

It also seems that the bulk of the increase in these health problems can be found among those aged 75 and older. The age gradient for these health issues was considerably steeper in 2000–2002 than in 1991–1992.

The prevalence rates of impaired mobility, musculoskeletal pain and psychological distress increased in all social classes during the period. The highest levels of increased reports of ill health can be observed among the lower non-manuals.

In table 3, the odds ratios of reporting ill health depending on period, sex, age and social class are explored by multivariate analyses. In accordance with the results from table 2, the results show an increase in the reports of impaired mobility, musculoskeletal pain and psychological distress in 2000–2002 when compared to 1991–1992, whereas the prevalence of poor self-rated health seems to have remained constant also when simultaneously adjusting for sex, age and class.

Women are more likely than men to report problems in these health domains, but sex seems to have no effect at all when it comes to reporting poor self-rated health. An age gradient is discernible for all the indicators of health except musculoskeletal pain. As table 2 showed an age gradient for musculoskeletal pain in 2000–2002 but not in 1991–1992, the model was tested by including an interaction term (data not shown) revealing a significant interaction between period and

### Table 1 Distribution of sample over period, gender, age group, and social class (percentages (actual numbers in parentheses))

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<tr>
<td>Age group (years)</td>
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<tr>
<td>55–59</td>
<td>17.5 (352)</td>
<td>23.0 (477)</td>
<td>17.2 (346)</td>
<td>17.7 (366)</td>
<td>17.2 (346)</td>
<td>15.4 (319)</td>
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<tr>
<td>60–64</td>
<td>16.3 (329)</td>
<td>13.5 (280)</td>
<td>11.9 (240)</td>
<td>8.1 (167 )</td>
<td>11.6 (233)</td>
<td>11.7 (243)</td>
</tr>
<tr>
<td>65–69</td>
<td>11.9 (240)</td>
<td>8.1 (167 )</td>
<td>11.6 (233)</td>
<td>11.7 (243)</td>
<td>8.3 (167)</td>
<td>10.6 (220)</td>
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<tr>
<td>70–74</td>
<td>19.1 (384)</td>
<td>17.3 (358)</td>
<td>11.3 (227)</td>
<td>1.0 (21)</td>
<td>19.1 (384)</td>
<td>17.3 (358)</td>
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<tr>
<td>75–79</td>
<td>19.1 (384)</td>
<td>17.3 (358)</td>
<td>11.3 (227)</td>
<td>1.0 (21)</td>
<td>19.1 (384)</td>
<td>17.3 (358)</td>
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<tr>
<td>80–84</td>
<td>19.1 (384)</td>
<td>17.3 (358)</td>
<td>11.3 (227)</td>
<td>1.0 (21)</td>
<td>19.1 (384)</td>
<td>17.3 (358)</td>
</tr>
<tr>
<td>85+</td>
<td>19.1 (384)</td>
<td>17.3 (358)</td>
<td>11.3 (227)</td>
<td>1.0 (21)</td>
<td>19.1 (384)</td>
<td>17.3 (358)</td>
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### Table 2 Percentages reporting health problems by period, gender, age group, and social class

<table>
<thead>
<tr>
<th></th>
<th>Poor self-rated health</th>
<th>Impaired mobility</th>
<th>Pain</th>
<th>Psychological distress</th>
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<tbody>
<tr>
<td>Gender</td>
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<tr>
<td>Male</td>
<td>12.1</td>
<td>22.0</td>
<td>25.4</td>
<td>38.7*</td>
</tr>
<tr>
<td>Female</td>
<td>13.7</td>
<td>22.0</td>
<td>25.4</td>
<td>38.7*</td>
</tr>
<tr>
<td>Age group (years)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>55–59</td>
<td>10.2</td>
<td>15.9</td>
<td>14.3</td>
<td>36.2</td>
</tr>
<tr>
<td>60–64</td>
<td>9.6</td>
<td>18.2</td>
<td>20.8</td>
<td>33.5</td>
</tr>
<tr>
<td>65–69</td>
<td>8.4</td>
<td>21.7</td>
<td>23.0</td>
<td>32.5</td>
</tr>
<tr>
<td>70–74</td>
<td>8.5</td>
<td>26.1</td>
<td>31.4</td>
<td>28.1</td>
</tr>
<tr>
<td>75–79</td>
<td>17.6</td>
<td>35.0</td>
<td>47.0*</td>
<td>37.2</td>
</tr>
<tr>
<td>80–84</td>
<td>18.0</td>
<td>42.1</td>
<td>56.7***</td>
<td>35.3</td>
</tr>
<tr>
<td>85+</td>
<td>31.3</td>
<td>67.1</td>
<td>69.4</td>
<td>33.5</td>
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<tr>
<td>Social class</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Higher and intermediate non-manuals</td>
<td>9.8</td>
<td>17.8</td>
<td>22.7*</td>
<td>25.6</td>
</tr>
<tr>
<td>Lower non-manuals</td>
<td>10.9</td>
<td>24.3</td>
<td>36.3**</td>
<td>33.1</td>
</tr>
<tr>
<td>Manual workers</td>
<td>15.9</td>
<td>35.2</td>
<td>38.3</td>
<td>39.4</td>
</tr>
<tr>
<td>Farmers and the self-employed</td>
<td>12.5</td>
<td>31.0</td>
<td>37.8*</td>
<td>33.9</td>
</tr>
</tbody>
</table>

**P < 0.01; *P < 0.05; ***P < 0.001; \( P \leq 0.05 \)
age group. Thus, it seems an age gradient in musculoskeletal pain has emerged during this period, meaning that in 1991–1992, there was no clear association between age and musculoskeletal pain, but in 2000–2002, the prevalence of reported musculoskeletal pain increased with age.

Moreover, all dimensions of health were associated with social class. Manual workers were significantly more likely than higher and intermediate non-manuals to report problems in all four dimensions of health, whereas lower non-manuals were more likely than higher and intermediate non-manuals to report impaired mobility, pain and psychological distress. Farmers and the self-employed were significantly more likely than higher and intermediate non-manuals to report impaired mobility and pain.

All the models were also tested by including interaction terms (not shown) for period and gender, age group and social class. The only interaction that turned out statistically significant was the interaction between period and age group for musculoskeletal pain. Thus, the results would suggest that the social gradient in health, as well as the gender gap has remained constant in relative terms during the studied period.

LAR showed that ill health could be reduced by between 16 and 37%, depending on health indicator and period, if all social classes would have the same levels of ill health as the most privileged (i.e. the higher and intermediate non-manuals). There was no statistically significant change over time in these proportions. These calculations were not adjusted for age or gender. However, as the estimated prevalences of ill health, adjusted for age and gender (data not shown) did not differ substantially from the actual prevalences (as shown in table 2) it is unlikely that such an adjustment would affect the LAR estimates significantly.

### Discussion

This study explored health inequalities among older individuals in Sweden between 1991–1992 and 2000–2002. The results showed an increase in the reports of impaired mobility, pain and psychological distress between the two points in time, although the prevalence of poor self-rated health remained unchanged over the period. The highest levels of ill health could be seen in the oldest age groups. It was also in these groups that the increase in health problems was greatest. It should be noted, however, that the prevalence of reported ill health in these domains, among these age groups, was notably lower in 1991–1992 (i.e. when they were 10 years younger) suggesting that the increased gradient cannot only be explained by the ageing of unhealthy cohorts.

Moreover, the results showed significant inequalities in the reports of ill health depending on sex and social class. Women were more likely than men to report impaired mobility, pain and psychological distress, a difference that seemed to increase over the period. However, when adjusted for age group, this increase becomes insignificant, suggesting that it could have been an effect of differences in age structure between the sexes. Manual workers were significantly more likely than higher and intermediate non-manuals to report ill health in all the measures of health. Lower non-manuals were more likely than higher and intermediate non-manuals to report impaired mobility and pain. However, analyses exploring potential interactions did not suggest that the increase in the prevalence of reported health problems had affected the social gradient in health or the gender gap, in relative terms.

Whereas earlier studies have shown that socioeconomic inequalities in health among younger age groups in Sweden have remained stable during this period, this is (to our knowledge) the first study to focus on the development of socioeconomic inequalities in health among older adults during this period. The data used is suitable for this kind of analyses for several reasons: it encompasses late middle-age as well as the oldest old, and also comprises a nationally representative sample of the elderly population in Sweden including both institutionalized and community-dwelling individuals.

However, a couple of issues should be considered when interpreting these results. Firstly, the data set consists of two different, albeit closely related, materials (LNU and SWEOLD) that have been merged together. Perhaps the most important difference for this study is the difference in use of proxies between the studies. Whereas SWEOLD uses proxies when the respondent is unable (most often due to illness) to answer the questions, LNU does not. This could mean that there is
a higher non-response rate among those with poor health in LNU than in SWEOLD. This could explain the increase in the prevalence of ill health observed among those aged 75 and older (i.e. around the point where the materials were merged) in the study. However, the analyses were performed without the answers given by proxies in SWEOLD (not shown), and the gap remained, albeit somewhat less wide.

Second, caution should always be exercised when measurements from only two points in time are used to assess change over time. It is possible that measurements from a particular point in time could deviate from a general trend. Using measurements from such a point in time as one of two periods used to assess change over time could consequently lead to deceptive results. However, the results from this study are in line with other studies.

The study shows that ill health, as measured by impaired mobility, musculoskeletal pain and psychological distress among older adults in Sweden, increased between 1991–1992 and 2000–2002. This result is in line with earlier research and could be explained by increased survival among older people with longstanding illnesses. On the other hand, the levels of poor self-rated health did not increase over the period, and were generally lower than for the more specific measures of health. This finding indicates that the association between self-rated health and the other health domains among older adults is moderate at best, suggesting that many older individuals accept a certain degree of morbidity without perceiving themselves as having poor health. The results also showed that the increased levels of reported health problems had no apparent effect on the social gradient in health or showed that the increased levels of reported health problems among older adults is moderate at best, suggesting that many older adults in Sweden in the early 1990s and, again, in the early 2000s. There was a discernible social gradient in health during both periods; those with a background as manual workers reported more health problems than those with a background as non-manuals. Significant gender differences in health were found during both periods; women were more likely than men to report impaired mobility, pain and psychological distress. The magnitude of the health inequalities did not change between the two periods. Any health policy interventions aimed at the older population should take in to account these health inequalities.

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Conflicts of interest: None declared.

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