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Mortality in Stockholm: Recent Past, Present, and Future

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Time trends in life expectancy

In the county of Stockholm, life expectancy at birth now surpasses 76 years for men and 81 years for women. For women, this level is practically the same as for Sweden as a whole, while for men, the level in the capital region is slightly lower than the national figure. Female life expectancy has increased gradually over time in recent decades. For men, by contrast, life expectancy did not increase much at all during the 1970s, which is similar to the situation during the 1950s and the 1960s. During the first half of the 1980s, however, male life expectancy started to increase rather rapidly and the situation has also been very favorable during the years of the 1990s for which we now have data.

Time trends in life expectancy for the Stockholm region are rather similar to trends for other regions of the country. Qvist (1997) presents life tables for the various counties of Sweden and concludes that there are distinct differences in mortality levels between regions in Sweden and that these differences remain fairly stable over time. Generally, mortality levels are higher in the northern parts of Sweden (Norrland) and, for men, slightly higher in metropolitan areas than in other regions. However, the excess mortality for men in the county of Stockholm has decreased lately. Qvist notes that recent increases in life expectancy in Sweden have been quite remarkable: the improvements up until the latest five-year period were greater than for any other period since the middle of this century. It is noteworthy that recent changes in life expectancy seem to be unrelated to changes in the
broader economic situation in Sweden: life expectancy increased very rapidly during periods of economic problems (the first half of the 1980s and the 1990s) but stagnated during the boom years of the latter part of the 1980s. Finally, we note that the difference between male and female life expectancy at birth remains substantial. The gap did narrow by one year in the 1980s and possibly by another year in the 1990s, but it still exceeds five years.

Figure 1. Life expectancy at birth for men and women in the county of Stockholm, 1970–1996 (with a forecast to 2003).

Figure 2. Sex difference in life expectancy at birth in the county of Stockholm, men compared to women, 1970–1996 (with a forecast to 2003).
Differentials in mortality levels are very often explained nowadays in terms of factors related to individual lifestyles (see Kunitz, 1987, for a review of changes over time in explanations of mortality patterns) even though sex-specific mortality differentials are also ascribed to biological factors. The recent narrowing of the gap in life expectancy between men and women is thus often interpreted as a logical consequence of a convergence in the lifestyles of Swedish men and women. Today individuals of both sexes exhibit similar behavior as regards, for example, the use of drugs such as tobacco and alcohol. Women also participate in the labor force nearly to the same extent as men; this has probably not contributed to the narrowing of the mortality gap however since housewives most often are found to have poorer health status than working women. Finally, men have probably started to show a greater concern about health-related matters than was previously the case. The lifestyles of men and women have been converging for a rather long time and a decline in the sex difference in life expectancy has been expected in many forecasts about mortality patterns. Yet the gender gap persists to be large. The reason for this might be that changes in lifestyle have an accumulated impact on the health status of individuals which becomes evident in mortality figures only later on in time.

Hemström (1996) and Vallin (1993) discuss various explanations for sex differentials in mortality, and both suggest that differences in the occupational profiles of men and women should have a great impact on such differentials. Men’s death rates are more strongly correlated with their type of occupation than are women’s death rates, and male workers in stagnating manufacturing industries have especially high mortality rates. The changing occupational structure, with a decline of such professions from the 1970s onwards, might therefore have contributed to the narrowing of the gender gap in mortality.

The role of alcohol is also often discussed in analyses of mortality, and a relationship is often found even between aggregate statistics on alcohol consumption for an area and statistics on life expectancies, especially for men, in that area. Leon et al. (1997) discuss the spectacular covariation that is found between figures on alcohol consumption and mortality changes in Russia during the 1980s and the 1990s, and Meslé and Hertrich (1997) give further examples of covariation over time between levels of alcohol consumption and life expectancies for a number of European countries. It is interesting to note that one find such an aggregated relationship for Sweden as well: sales of spirits started to decline at the beginning of the 1980s,
i.e. around the same time when male life expectancy started to show substantial improvements. In earlier decades, on the other hand, sales of spirits had increased regularly - parallel to a simultaneous increase in the gap in life expectancy between women and men.

Figure 3. Consumption of spirits in Sweden, liters (in millions).

![Graph showing consumption of spirits in Sweden from 1945 to 1995.](image)

Source: SCB, Statistical Yearbook of Sweden.

The increased life expectancy in Stockholm (and in Sweden in general) has resulted in a shift towards higher ages at death. A comparison between the age distribution of deceased men in the county of Stockholm in 1970 and in 1994 reveals that proportionately fewer men died at ages 50–69 in 1994 than in 1970 and that relatively more men died at ages above 70 (Figure 4). For females there was a similar redistribution of deceased individuals from ages 50–79 years to ages above 85 (Figure 5). It is also obvious that the age span in which individuals typically tend to die was narrower in 1994 than in 1970. Figures 4 and 5 show proportions of recorded deaths, so the changing age distribution of deceased individuals is due both to changes in age-specific probabilities of death and to changes in the (aging) population structure of the county. Since we are interested only in the first factor, we will provide in the next section a more detailed presentation of age-specific probabilities of death for men and women in the county of Stockholm.
Figure 4. Age distribution of deceased males in the county of Stockholm in 1970 and in 1994 (percent).

Figure 5. Age distribution of deceased females in the county of Stockholm in 1970 and in 1994 (percent).
Mortality by age and sex

A diagram of age-specific probabilities of death for men and women in the county of Stockholm demonstrates the rather rectangular pattern of these probabilities. They are very low at all ages below retirement age, and they start to increase (more or less exponentially) only at fairly high ages.

Figure 6. Probability of death in 1996, by age, for men and women in Stockholm.

The present pattern of probabilities of death is the result of a long-term transition from a situation where mortality levels were high at younger ages as well, especially for children. The period-based life expectancy at birth, as presented in the previous section, is a summary measure of the mortality situation in a given calendar year; it is calculated from probabilities of death such as those presented in Figure 6. (Alternatively, life expectancies can be calculated for cohorts, as is done by Lundström, 1997, for cohorts of the Swedish population.) Since mortality is extremely low at younger ages today, changes in life expectancy mainly stem from changes in mortality at higher ages. The latest improvements in life expectancy at birth reflect improvements in health and survival chances at ages above 65, while, for men, there also is a noticeable contribution from mortality reductions at working ages (for Sweden, see Qvist, 1997, Table 3.1). Significant mortality reductions at advanced ages have not always been observed
or expected — and Olshansky and Ault (1986) refer to these latest improvements as a fourth stage of the epidemiological transition model given by Omran (1971): the age of delayed degenerative diseases. (The epidemiological transition model as formulated by Omran describes the transition from a situation with high mortality from infectious diseases to a mortality situation dominated by deaths from degenerative and man-made disease.) Such trends have also led Coale and Guo (1989) to make revisions of earlier calculated Regional Model Life Tables describing mortality profiles for different groups of countries in order to get a better fit to observed mortality patterns at advanced ages. In their models, they now incorporate the assumption of a decrease in the rate of increase in mortality by age at ages above 80.

In a low-mortality country such as Sweden, it is now mortality changes at advanced ages that have the greatest effects on, for example, life expectancy at birth and on the age distribution of deceased individuals. This does not mean, however, that survival chances at younger ages are not improving. On the contrary, probabilities of death are being reduced at all ages, and seen in relative terms, these reductions have been particularly sizeable recently for those age groups where mortality is already very low, i.e., for the youngest age groups. Figure 7 displays age-specific probabilities of death in 1996 (from Figure 6) relative to those of 1990, separately for men and women, in the county of Stockholm. This presentation gives us a picture of the relative reductions in mortality at various ages (when values are below 1). One can immediately see that there have been substantial mortality reductions at practically all ages and that reductions at ages below 30 have been particularly spectacular. For males, mortality at these younger ages decreased to roughly half the level of 1990 in a period of only six years. Since the curves at younger ages are based on rather few deaths, they are less smooth at these than at higher ages. There is however no doubt about the general age pattern of observed mortality changes in the Stockholm area in the 1990s.

While much has been published on recent mortality changes at working and advanced ages, less attention has been paid to mortality changes in childhood, adolescence, and early adulthood. One might speculate that the accelerating concern, and even obsession, with safety in Sweden has contributed to the favorable trends in the mortality experience of the young. For example, in the 1990s, few parents would let their children ride a bicycle without wearing a helmet or sit in the back seat of a car without using a safety belt. Other factors that might have contributed to these trends are improved care for lethal diseases among children and the fact that far fewer young adults were able to afford to get a driving license in the 1990s.
Figure 7 also reveals that mortality reductions at most ages have been greater for males than for females. This is the case for children and young adults (ages below 30), but maybe more importantly so for adults between 50 and 65. Male mortality has decreased more than female mortality also at ages above 65, while there seems to be no clear male advantage in the relative improvement at ages between 30 and 50. As a summary, the information from Figure 7 is also given in Table 1, recollected into levels of annual reductions and showing the average mortality reductions for a few aggregated age groups.

Figure 7. Ratios of probabilities of death in 1996 to those of 1990, by age and sex, County of Stockholm.

<table>
<thead>
<tr>
<th>age group</th>
<th>males</th>
<th>females</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–30</td>
<td>8 %</td>
<td>5 %</td>
</tr>
<tr>
<td>31–50</td>
<td>3 %</td>
<td>4 %</td>
</tr>
<tr>
<td>51–65</td>
<td>4 %</td>
<td>2 %</td>
</tr>
<tr>
<td>66–80</td>
<td>2 %</td>
<td>1 %</td>
</tr>
<tr>
<td>81+</td>
<td>1 %</td>
<td>1 %</td>
</tr>
</tbody>
</table>
The fact that mortality reductions have recently been greater for males than for females also indicates that the excess mortality of males declined during the 1990s. At practically all ages, however, the probability of death is still substantially higher for males than for females. The relative excess mortality of males at different ages is shown for 1990 and 1996 in Figure 8. This figure presents ratios of probabilities of death for males to those for females in these two years. (For 1996, these ratios are calculated from the probabilities of death presented in Figure 6.)

Figure 8. Ratios of probabilities of death for males to those for females, by age, 1990 and 1996, County of Stockholm.

The figure shows that, at least from puberty, and onwards, mortality is considerably higher for men than for women. For young adults (15–40) probabilities of death are generally two to three times higher for men than for women. At retirement age, male mortality is still around twice that of female mortality, but after that excess mortality for men gradually starts to decline with age. The curve is irregular at younger ages due to small probabilities of death, but significant male excess mortality is nonetheless evident at practically every single year of age. The relative improvement in male mortality observed between 1990 and 1996 is evident in that the curve of male excess mortality in
1996 generally lies below that of 1990. Similar curves showing sizeable male excess mortality at working ages have been presented by Vallin (1993) for France.

Geographical variation in mortality in the county of Stockholm

As described by Qvist (1997), there is a persistent and fairly stable geographical variation in mortality levels in Sweden, which is expressed by mortality differentials between counties. Van der Veen (1994) similarly finds mortality differentials between regions in Belgium, Germany, and the Netherlands, differentials that he ascribes to societal and cultural forces. Valkonen (1992) also finds strong regional variation in mortality in Finland and suggests that such variation might be explained by genetic factors. Other factors that can be important in explaining regional variation in mortality are differences in living arrangements and in the socioeconomic structure of the population of the various regions. Such factors are most probably important for an explanation of mortality differentials between the county of Stockholm and Sweden as a whole. The possible impact of such factors becomes clearer if one subdivides the Stockholm area into a few smaller sub-areas which are more homogeneous according to household structure and socioeconomic status of the population. Such a subdivision also reveals very pronounced geographical variation in mortality patterns within the capital region.

A separate calculation of life expectancies at birth for the city of Stockholm reveals, for example, that, while life expectancy for men in the county of Stockholm is between a half and a full year lower than in the rest of Sweden (with a declining differential over time), it is up to two years lower in the city of Stockholm than in Sweden as a whole (with a stable differential over time). For women, we find no differentials in life expectancy between the population in Sweden and that of the county of Stockholm, but life expectancy is slightly lower (and increasingly so) for women in the city of Stockholm than for women in the rest of the county/country.

This means that the somewhat lower life expectancy for males in the Stockholm region stems entirely from a lower life expectancy in the city itself. Olinder (1991) shows that the higher male mortality in the city of Stockholm in the 1970s and 1980s was caused by excess mortality both from diseases and from deaths from accidents and suicides and that this excess mortality was found in almost all adult
age groups (one exception is the age group 15–19, where males in the city had lower mortality from accidents, probably due to the fact that there were fewer mopeds in the city than elsewhere). Similar excess mortality was also found for women in some age groups (35–59 years), but mortality differentials by region are generally smaller for women than for men.

Table 2. Life expectancy at birth for men and women in Sweden, County of Stockholm and City of Stockholm.

<table>
<thead>
<tr>
<th></th>
<th>City of Stockholm</th>
<th>County of Stockholm</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973</td>
<td>69.9</td>
<td>71.0</td>
<td>72.1</td>
</tr>
<tr>
<td>1983</td>
<td>71.8</td>
<td>73.0</td>
<td>73.6</td>
</tr>
<tr>
<td>1993</td>
<td>74.1</td>
<td>75.7</td>
<td>76.0</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973</td>
<td>77.4</td>
<td>77.7</td>
<td>77.6</td>
</tr>
<tr>
<td>1983</td>
<td>79.1</td>
<td>79.5</td>
<td>79.5</td>
</tr>
<tr>
<td>1993</td>
<td>80.5</td>
<td>81.4</td>
<td>81.4</td>
</tr>
</tbody>
</table>

The higher mortality in the city is often explained in terms of lifestyles, which are often different in a big city than elsewhere and sometimes are also related to poorer health. This view is supported by the fact that the capital region’s excess mortality from diseases stems mainly from diseases related to the use of alcohol and tobacco – both for men and for women (Stockholms läns landsting, 1988, for the period 1974–1983). An important factor behind the relationship between lifestyles and mortality in Stockholm is that a much higher proportion of the population in the city lives in single-person households rather than in families (Schéele, 1991). A big city can offer a refuge for those who want to escape the destiny of setting up a conventional family unit in a conventional family building, but this refuge often has serious consequences for one’s health. It is a general finding that marital and family statuses are very important factors behind mortality differentials in developed countries. Yuanreng and Goldman (1990) present such patterns for a number of countries and show that mortality is substantially higher for never-married people as well as for divorced and widowed people than it is for those who live in marriage. The protective effect of marriage is stronger for males than for
females. Mellström (1988) shows that the effect of marital status is also very important when explaining mortality differentials among the elderly in Sweden.

A further subdivision of the county of Stockholm along geographical lines reveals that there are very strong differences in mortality levels between different areas within the region. If, for example, one calculates life expectancies at birth for the various health-care sectors of the county of Stockholm (see Stockholms länns landsting, 1998), one finds that men in the sector with the lowest mortality level have a life span that is estimated to be over four years longer than the expected life span of men in the sector with the poorest health situation. Also for women the difference is strikingly large: the gap between the best and the worst sector amounts to three years of expected life. The gap in life expectancy between these two health-care sectors, North Eastern SO\(^5\) and Stockholm Southern SO, probably reflects differences in household composition but also in the socioeconomic status of the two areas. While the North Eastern SO contains the municipalities with the most wealthy populations to be found in the region, and in all of Sweden for that matter, Stockholm Southern SO contains the inner suburbs of the southern part of the city of Stockholm, a less glamorous area, where dwellings are rather small and where the population generally has a low socioeconomic status.

Table 3. Life expectancy at birth for men and women in those health-care sectors in the county of Stockholm with the highest/lowest mortality levels in 1996.

<table>
<thead>
<tr>
<th></th>
<th>Stockholm Southern SO</th>
<th>North Eastern SO</th>
<th>County average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>74.3</td>
<td>78.6</td>
<td>76.5</td>
</tr>
<tr>
<td>Females</td>
<td>80.7</td>
<td>83.7</td>
<td>81.6</td>
</tr>
</tbody>
</table>

Similarly to the situation of mortality differentials between counties in Sweden, geographical variation in mortality within the capital region seems to be fairly stable and persistent over time. Possibly, one can see decreasing variation for men and an increasing level of variation for women, so that the geographical differences in mortality have become more similar for the two sexes. A rather stable geographical pattern of mortality differentials in the region is also what one would suspect, unless the populations of the various sub-areas change their socioeconomic or living-arrangement status drastically. Socioeconomic mortality differentials are known to be surprisingly persistent over
time. Valkonen (1997) shows that such differentials have even tended in many countries to increase, as mortality from cardiovascular diseases is normally higher today among working-class men than among men of the upper classes, which is contrary to the situation of the 1950s and the 1960s. Vågerö and Lundberg (1995) find widening, rather than narrowing, class differentials in mortality for middle-aged men in Sweden, and Leon et al. (1992) find social-class differences also in Swedish infant mortality. Class differences in mortality are usually found for women as well, but these differences are generally smaller than for men. Valkonen (1992) suggests that the more rapid improvement in the health of white-collar employees and other nonmanual workers may be the result of a greater willingness and ability on the part of these groups to respond to new information about health-related behaviors and that the manual workers might follow the trend towards healthier lifestyles as time proceeds.

In the next two figures (Figures 9 and 10), we display age-specific mortality differentials between three sub-areas of the capital region and the entire county. These areas have been formed by grouping all municipalities in the county according to their mortality levels. Such a grouping results in the following areas:

- Stockholm city and Sundbyberg, in the core of the metropolitan region;
- upper grade areas (Östermalm in Stockholm, Lidingö, Danderyd, Täby, Vallentuna and Ekerö). These are wealthy municipalities in which most families own their own home;
- the rest of the region (other suburban municipalities).

This grouping of the municipalities according to mortality levels gives one high-mortality group, which is characterized by a household structure with a relatively high proportion of single-person households, one low-mortality group, which is characterized by the extremely favorable socioeconomic composition of its population, and, finally, the rest of the county, which is a mixture of different municipalities with county-average mortality levels. We display ratios of the age-specific probabilities of death for each of these three sub-regions to those of the county as a whole. Figure 9 gives the ratios for men and Figure 10 for women. Since the areas are now smaller than before, we restrict our presentation to ages above 40; the number of deaths at lower ages is too small to provide any sensible information.
The figures show that distinct mortality differentials exist at all adult ages, both for men and for women. While the mortality levels in "other suburbs" are generally similar to those of the whole region, mortality is lower at all ages in the "upper grade" municipalities and higher in the "Stockholm city" area. The geographical variation in mortality levels is especially evident for men at working ages: middle-aged men in the city have, for example, around 40 percent higher mortality rates than men in "other suburbs" while middle-aged men in the wealthy areas have around 20 percent lower mortality. These differences narrow at ages around retirement. For females, excess mortality in the city of Stockholm is found almost entirely among the middle aged, while the lower female mortality in the wealthier municipalities is due to equally reduced mortality (by 10–20 percent) at all adult ages. Similar patterns of regional variation are also found for infant mortality and for mortality among children and young adults (not shown), but the figures for these age groups are much more erratic then those presented here.

Figure 9. Ratios of probabilities of death for different parts of the county of Stockholm to those for the whole county, by single-year of age, 40–95 years, 1996, for men.
Assumptions about future mortality changes

Probabilities of death such as those presented in Figure 6 are also used as input data for making population forecasts for the county of Stockholm. In this case, these probabilities are applied to the (future) population of the area to estimate the future number of deaths. When making such forecasts, one of course has to make some kind of assumptions about how these probabilities will change in the future. In this final section, we will briefly discuss what kind of assumptions are usually made when population forecasts are made for the Stockholm region.

In forecasts of this nature, mortality is assumed to continue to decrease in the nearest future, and a pattern of annual reduction in rates is cumulatively imposed on the initial probabilities of death. For the more distant future, a slowing down of the mortality reduction is assumed, and sometimes this reduction is even expected to cease at some distant point in future. This kind of slowing-down assumption is often based on the notion that there exists some kind of upper limit to life expectancy. A specific age and sex profile can be assumed for the reduction rates, so that probabilities of death change at a different pace at different ages and for the two sexes. Since a convergence of mortality patterns for men and women is often expected today, it is
common, for example, to assume that mortality reductions will be relatively greater for males than for females. No geographical variation in mortality reduction is assumed when making forecasts for sub-regional areas. Implicitly, this means that the geographical variation in mortality between different areas within the Stockholm region is expected to persist in the future.

When making assumptions about the age- and sex-specific pattern of future mortality reductions in Stockholm, it is of course most important to consider the assumptions that concern changes at advanced ages, since such changes now have the greatest impact on future population structures, on number of deaths, and on life expectancies. Mortality at the oldest ages started to improve substantially only rather recently (at least for men) and the recent improvements have triggered a debate about whether there exists an upper limit to human life or whether the present limit is slowly being pushed upwards towards increasingly higher ages. Fries (1980) argues for the former idea and believes that the present mortality reductions will consequently result in a compression of deaths into a fairly narrow age span, but that life expectancy will not increase beyond 85 years. Manton et al. (1991), and others, argue on the other hand that no such rectification of death rates can be observed; there is still substantial variation in ages at death and mortality is being reduced also at advanced ages. Vaupel and Lundström (1996) show that, for Sweden and from the 1950s onwards, the latter argument turns out to be true and that the idea that oldest-old mortality rates cannot be reduced is incorrect. They assume future mortality reductions also at advanced ages. Wilmoth and Lundström (1996) provide further support for this view by showing that the maximum recorded ages at death, at least in Sweden, also have tended to increase over time.

Yet, assumptions have to be made for other ages as well. One way to make such assumptions is simply to use observed mortality reductions from recent years – in order to extrapolate them into the future. For the Stockholm area one would use in this case the annual mortality reductions by age and sex that were summarized in Table 1. A modified version of these reduction rates is presented in Figure 11. The pattern of these rates is modified here so that mortality reductions are the same for boys and girls below age 10 and so that they are greater for males than for females at all ages between 10 and 70. The figure presents the rates as annual rates of increase, i.e. as the numbers by which the present probabilities of death are to be multiplied when calculating future mortality levels. This means that lower levels of these rates, and rates with a value below 1, are
synonymous with greater mortality reductions. This pattern of mortality reductions is currently used when making population forecasts for the nearest future for the county and for the city of Stockholm. For more distant years, local forecasters instead use modified versions of the mortality assumptions made at Statistics Sweden in their forecasts for the national population.

Figure 11. Annual rates of increase in probabilities of death, by age and sex, in line with observed patterns in the county of Stockholm in the 1990s.

Finally, we display in Figures 12-14 the patterns of mortality reductions that have been used by Statistics Sweden in their latest forecasts in the 1990s. One sees increasing optimism in their assumptions, as well as other adjustments to recent trends in mortality in Sweden. Yet, the strongest impression of our presentation is that these reductions seem to be fairly modest if one compares them to the observed mortality changes of the 1990s. Specifically, they do not fit very well with the mortality improvements at younger ages.

In the 1991 forecast an annual mortality reduction of 1 percent was assumed for all ages below 40, while a reduction of 1.5 percent was assumed for higher ages. A decreasing rate of reduction was assumed at the most advanced ages. Greater reductions were assumed for men than for women in the age span 40-55 years, but for the most
elderly a more favorable rate of reduction was assumed for women rather than men. In the 1994 forecast, no specific age pattern was assumed. Instead, the focus was entirely on sex differences in mortality patterns: males were supposed to experience slightly greater mortality reductions than females at all ages. At the most advanced ages, a leveling off of the rate of reduction was assumed, and practically no reduction at all was expected for the highest open age interval. This is in line with the notion that there exists an upper limit to the human life span.

Finally, a more optimistic view can be found in the 1997 forecast, in that mortality reductions for many ages are greater than in the two previous forecasts. Furthermore, notable mortality reductions are also expected at the very highest ages. An age pattern is assumed where reductions are greatest at ages around 70 years and where male reductions at all ages are slightly greater than female reductions. In this latest forecast, a slower future decline of the pace of reduction is also assumed.

Figure 12. Annual rates of increase in probabilities of death, by age and sex, in the population forecast of Statistics Sweden in 1991.
Figure 13. Annual rates of increase in probabilities of death, by age and sex, in the population forecast of Statistics Sweden in 1994.

Figure 14. Annual rates of increase in probabilities of death, by age and sex, in the population forecast of Statistics Sweden in 1997.
As mentioned above, assumptions based on observed mortality changes in the 1990s (Figure 11) are currently used by local forecasters in the making of population forecasts for the Stockholm area, at least for the nearest future. For the more distant future, it is probably not a fruitful idea to simply use past trends and apply them to the forecasts. Such assumptions should rather be based on some kind of understanding of how various factors may affect future mortality levels and patterns. Therefore, we use mortality assumptions from Statistics Sweden, in the hope that these assumptions reflect such an understanding of the changing patterns of mortality; we are relieved that we then don't have to make that kind of assumptions ourselves.

In many cases, assumptions made in population forecasts – be they assumptions about fertility, migration, or mortality – are heavily colored by the situation at the time when the forecast is being made. This might serve as a warning to us against being too optimistic when making assumptions about future mortality reductions in a climate of rapidly increasing longevity, but we will nevertheless end this paper with some words in support of the present feeling of optimism. When studying mortality from a cohort perspective, as is done by Lundström (1997) and others, one often finds that mortality is reduced in a cohort manner, so that groups of individuals who experience lower mortality in early phases of life are often found to experience relatively low mortality at higher ages as well. (Elo and Preston, 1992, review literature that tries to explain how adult mortality can be affected by conditions in early life.) In addition, recent work by Fogel (1997) points to the important relationship between height, as an indicator of early-life conditions, weight, as an indicator of present-life conditions, and mortality. Since height and weight patterns in contemporary populations are far from optimal, he concludes that there is still room for substantial improvements in mortality, improvements that may be greater than are usually expected in population forecasts. Taken together, these findings indicate that mortality at advanced ages might continue to decrease in the future as a consequence of present health improvements at younger ages, and that healthier life styles, resulting in better height and weight patterns of populations, might result in lower mortality levels at practically all ages.

Acknowledgements
I have benefited from discussions with Siv Schéele, Jeanette Bandel, and Gigi Santow. In addition, I am grateful for valuable editorial advice from Karl Brehmer.
Notes

1. As of 1996.
2. The city has around 41 percent of the population of the entire county.
3. Mopeds, which are permitted from age 15, used to be an important component of teenage life in Sweden.
5. See Stockholm’s läns landsting, 1988, for a presentation of life expectancies at birth for the health-care sectors up to that time, and Andersson, 1992 and 1996, for a comparison of life expectancies at birth for other groups of municipalities.
6. Population forecasts for the county of Stockholm are currently made by Inregia AB while forecasts for the city of Stockholm are made by USK.

References


