Trends in CVD morbidity, mortality and survival, among 85+ in Sweden.

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Cardiovascular diseases, CVD, are a major cause of death and account for a substantial part of hospitalization events as well as fatal events in Sweden and worldwide [1]. However, the age-standardized CVD trends, both disease and mortality trends, have declined in most western countries since the 1960-ies [2]. The reasons for this decline are several but both advances in medical care as well as declines in several important risk factors come into play [3]. CVD trends have been published almost exclusively for populations up to 85 years of age why little is known about the trends for the oldest part of the population. As the incidence of CVD increases heavily with age it is of great interest to study also the oldest in the population. In some publications the oldest are included but compressed into one group, often 85+. These trends are difficult to interpret as the mean age in this group has increased over time. Increasing incidence trends (as have been shown for MI in the Swedish population of 85+ [4]) can thus be stable or even decreasing if they had been age adjusted. As the proportion of the population above 85 years of age has grown at a fast pace, from 1.1% in Sweden 1970 to 3.8% in 2009, it is important to study if the decreasing CVD trends is continuing also after 85 years of age.

To get a complete picture of disease specific trends in a population, trends in incidence, mortality and survival or case-fatality need to be interpreted together [5]. Decreasing incidence trends of first CVD event (fatal or non-fatal) might be a good indicator of the effect of primary prevention on CVD rates. Decreasing mortality rates might be the results of either less events or increasing survival. In this study incidence of CVD, MI, and stroke were analyzed as all events (fatal or non-fatal), fatal only and non fatal only, for men and women separately. Finally, trends in case fatality (mortality among diagnosed) were studied.

All events of CVD, MI, and stroke registered in the Hospital Discharge Register or in the Cause of Death Register between 1987-2008 were identified. However, as the analyses were based on first events of CVD, MI or stroke we started the follow up in 1994, excluding individuals with an event between 1987-1993 in order to get a 7 year disease free period, which is the definition of a first event in the Swedish MI register. The follow-up ended at the date of death or hospitalization, date of emigration or on 31st December 2008 for mortality or morbidity, whichever came first.

To ensure the quality of the data, for example not to include individuals who emigrated but did not sign out from Sweden, died but did not get any death date etc., we linked the registries of income, pensions and social transfers to the database and included only those individuals who were in any of these registries the year before they died.

CVD, MI and stroke were defined using the International Classification of Diseases (ICD) codes. Morbidity and mortality from CVD was categorised as I00-I99 (ICD 10) and 390-459 (ICD 8 and 9). MI was categorised as I21 (ICD 10) and 410 (ICD 8 and 9) and stroke as I60-64, I67-69 (ICD 10) and 430-438 (ICD 8 and 9).

We analyzed cohort effects by looking at the incidence trends of age adjusted rates between 85 to 110 years of age, presented as three years moving average. The oldest ages are presented in the figures as 100 years and older. Finally we performed a Desecrate Time Model where the odds of an event per increase in birth year were calculated in five year age groups. By this strategy we could see whether the period effects were similar over age. A possible scenario is that younger ages have benefited more from decreasing CVD trends than older ages.

Preliminary results

The calculations of incidence rates (85 years and older) were based on 482 589 person years for men and 1 136 771 person years for women. The incidence trends for CVD have been rather been stable, however somewhat decreasing, the past 15 years for the ages 85 and older. For mortality the decrease has been slightly larger.

The analyses of the discrete time model showed that the effect of birth year on CVD risk was similar over all age groups, i.e. all ages have benefited from the decrease in CVD over time.

Fig 1. Incidence trends in CVD, men (3 year moving average)

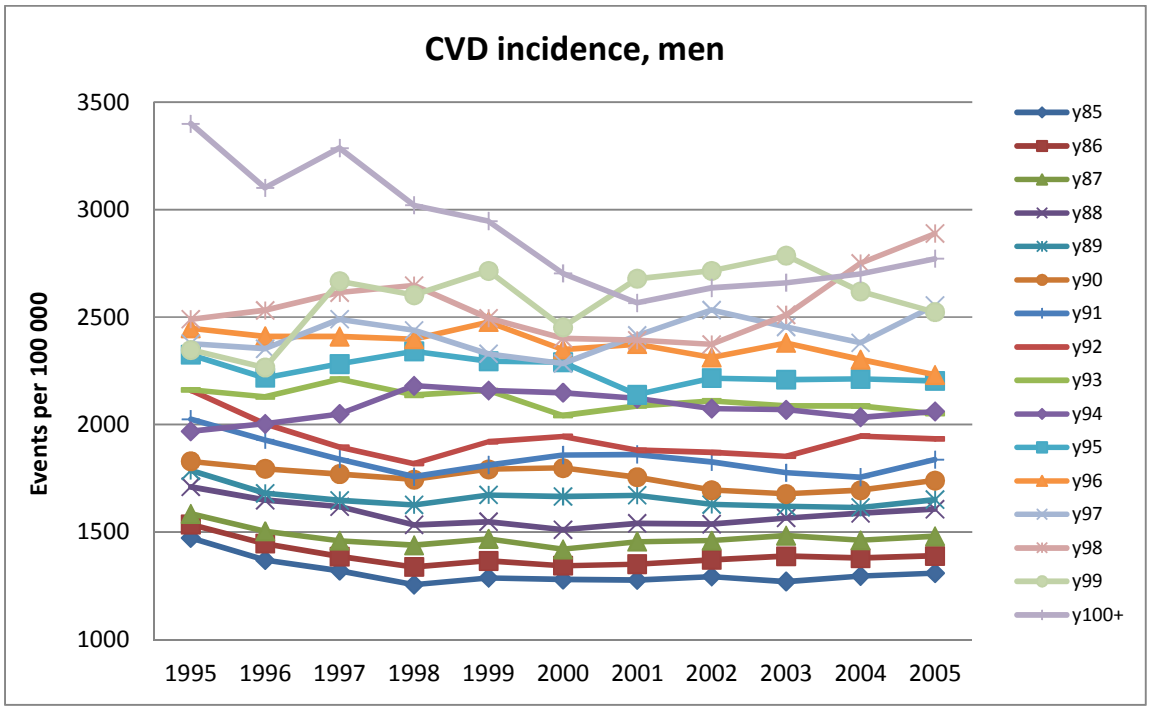


Fig 2. Incidence trends in CVD, women (3 year moving average)

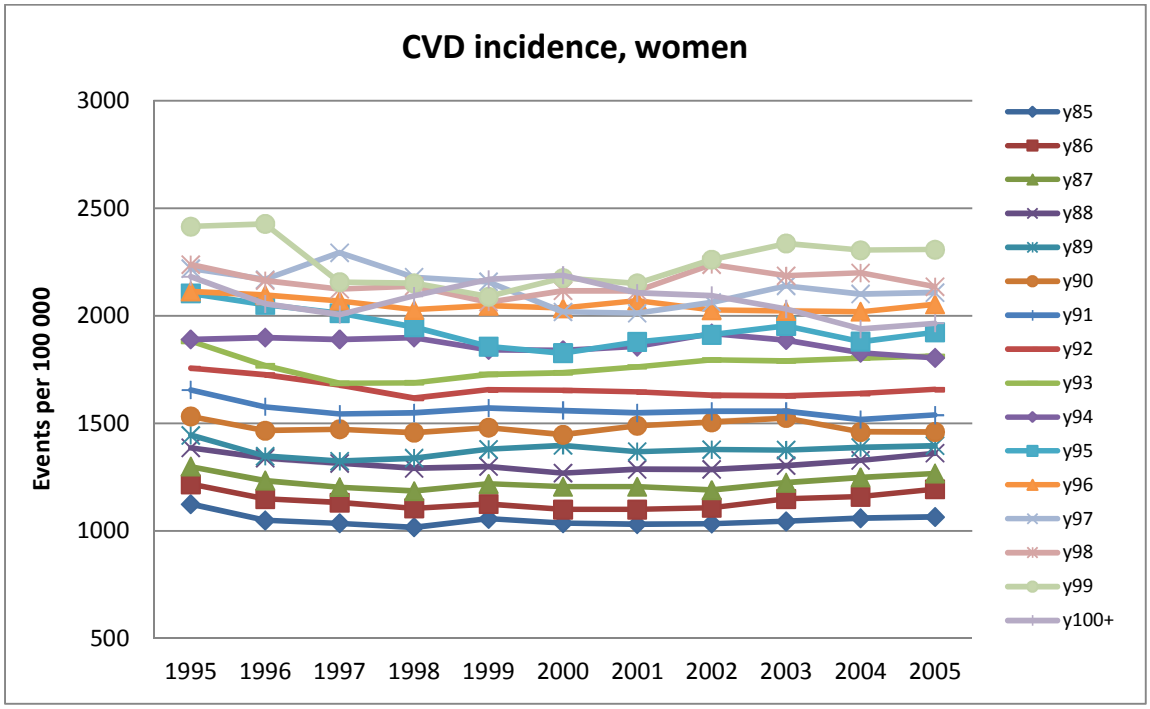


Fig 3. Incidence trends in fatal CVD, men (3 year moving average)

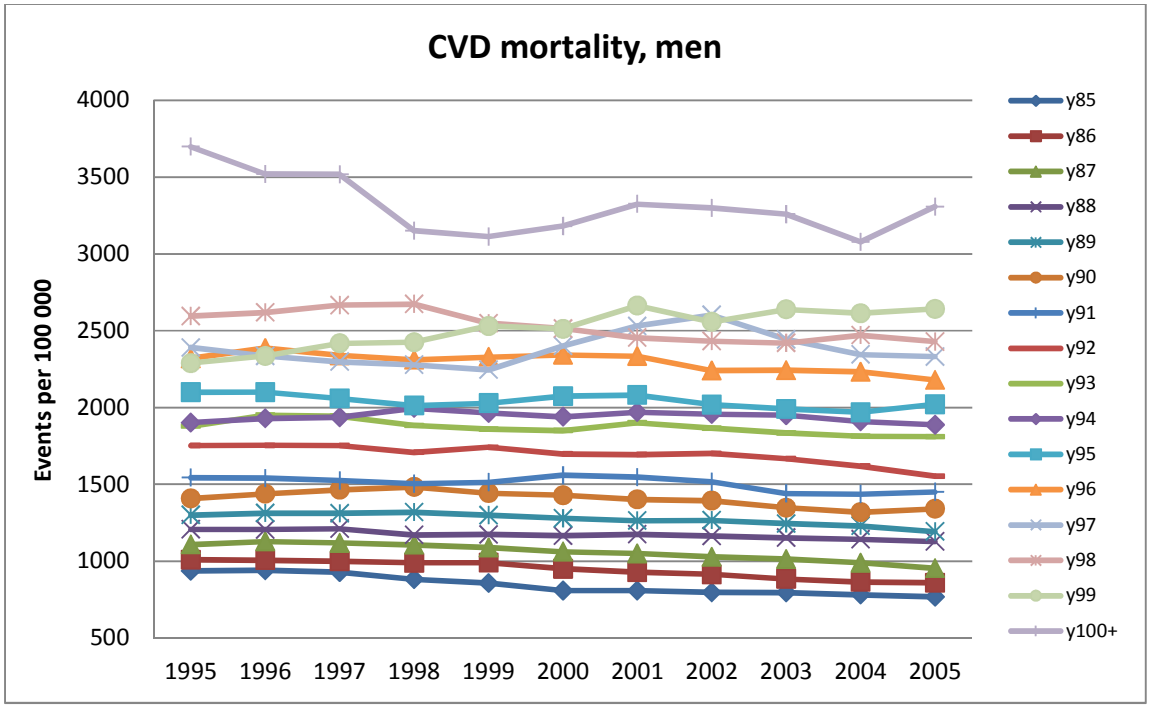
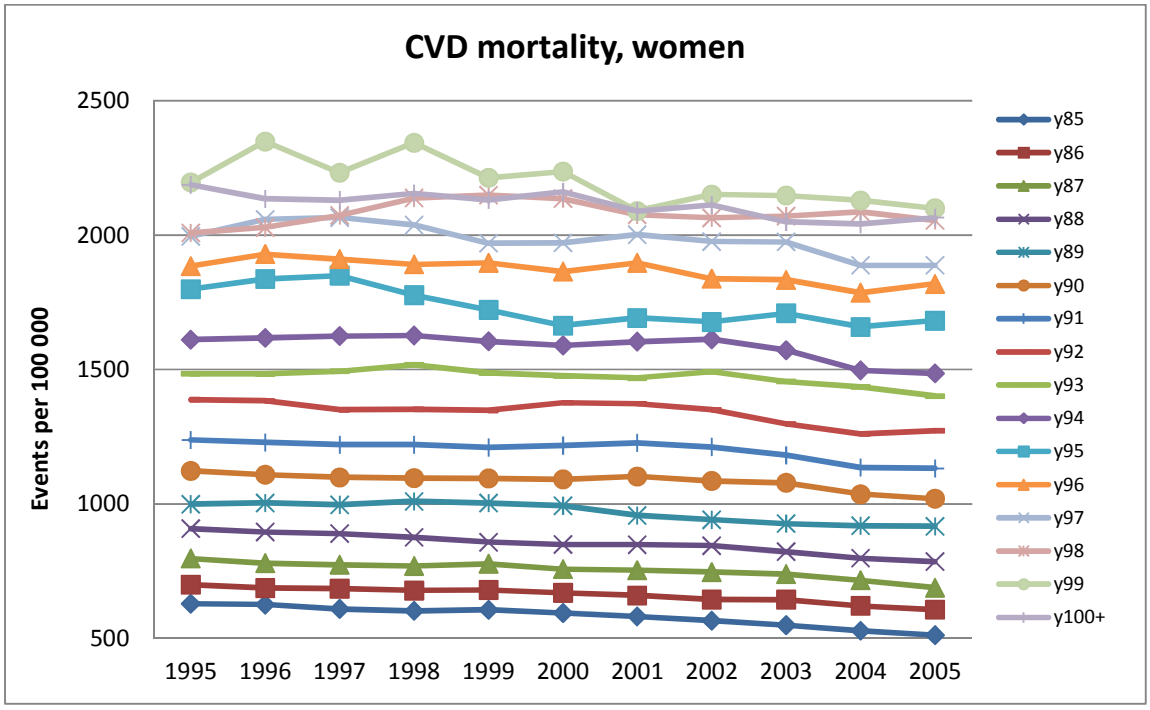


Fig 4. Incidence trends in fatal CVD, women (3 year moving average)



The analyses of stroke show similar results. For MI, however, there has been increasing incidences especially for women.

References

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