

## **Income and wealth predict all-cause and cause specific mortality in the Swedish population. A mortality follow-up 1991-2009.**

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Abstract

### **Background.**

Income, income distribution and mortality are associated, but there is considerable controversy about the true nature of any causal relation from income to health/mortality. Wealth is less studied but there is a priori reason to believe that wealth is important as an independent predictor of survival, and also as a potential confounder in studying income and mortality.

### **Methods**

We followed the entire Swedish population, born between 1925 and 1960, enumerated in the 1990 Population Census and alive on January 1<sup>st</sup> 1991, all in all 4 million individuals. Information about individual income and wealth was collected from the Census year in 1990. Mortality follow-up was until Jan 31<sup>st</sup> 2009. The 18 year follow-up period was divided into two periods, 1991-2002 and 2003-2009. Logistic regression was conducted to calculate mortality odds ratios for each period. We compared deciles of income and wealth with regard to their mortality experience, using the poorest income decile and those without tax-declared wealth (“skattepliktig förmögenhet”) as reference groups.

### **Results**

Mortality follows income in a graded way. The highest income decile has about half the mortality risk of the poorest decile. This graded relationship remains, or gets stronger, when wealth is taken into account simultaneously. Wealth is also an independent predictor of mortality. Income and wealth both predict specific causes of death, such as circulatory disease, cancer and external causes of death.

Mortality in 2003-2009 was almost equally strongly linked to income or wealth in 1990 as was mortality in the 1991-2002 period. Excluding all people with a history of hospitalisation during any year from 1981 to 1990, or with an income from the sickness insurance system in 1990 did not change the above results much. This suggests that selection of unhealthy people into low income and wealth deciles is an unlikely explanation of the graded relationship between income and wealth on the one hand and mortality on the other.

### **Conclusions**

Income and wealth are both independently linked to all-cause and cause specific mortality in a graded way in the Swedish population. Health selection seems not to be a major explanation of our results.