



Full length article

## Causal effect of income on health: Investigating two closely related policy reforms in Austria<sup>☆</sup>

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### ABSTRACT

I investigate the effect of income on mortality of the pensioners, comparing three subsequent policy periods in Austria in the early 2000s. The pensioners who retired in the second period received 25% lower pension than those in the first period. This reduction in income was removed in the third policy period. These two reforms allow a causal identification of the effect of income on health. I estimate that lower pension income did not change the mortality rate. The results are confirmed using both experiments and different methods of estimation. Furthermore, with regard to the expenditure on health services, I find that only prescribed drug consumption increased, with the remaining analyzed factors being unaffected.

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### Introduction

Health and income are positively correlated (see, e.g., Bloom and Canning, 2000; Rogot et al., 1992). Income might affect health and health might influence income in many different ways. Individuals who earn more can afford more and better health care. They are able to spend more money on health prevention, can afford to live in better and healthier environments, and may be more sensitive to unhealthy working conditions. “The differential use of health knowledge and technology [...]” (Cutler et al., 2006, p. 115) may also explain important parts of the relation between social status (including income) and health. There are pathways through which income may have a negative effect on health. Usually, the effect of higher earnings is associated with increased working hours, accidental risks or increased stress at

work. This influence of income on health can be described using a health production framework (Grossman, 1972).

In contrast, health may influence labor supply, effort, and thus, income. Smith (1998, 1999) and Wu (2003) analyze the causal effect of health on income using unanticipated health shocks.

Snyder and Evans (2006) use the Social Security notch to find evidence for an effect of income on mortality among the elderly in the US. This research design answers the very narrow question, whether income in the form of social transfers affects mortality in the elderly population. One additional main finding is that other sources of income turned out to be more healthy for this population.

Further empirical literature shows a positive but not always significant causal effect of income on health. Benzeval et al. (2000), Case (2004) and Frijters et al. (2005) find a small causal effect of income on self-reported health. Cawley et al. (2010) analyze the effect of reduced social security payments on the retirees' weight and BMI in the US and do not find any evidence for a causal effect of income on the weight or BMI of elderly Americans. Adams et al. (2003) also analyze the causal effect of income on health for elderly persons in the US. They do not find any “associations of health conditions and changes in total wealth” (p. 51) for persons aged 70 and above. In Austria, Ahammer et al. (2015) investigate the effect of income on mortality in a different setting and establish a robust zero effect for prime aged workers. Lindahl (2005) does not find any significant effect of lottery prizes on mortality in Sweden. In

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	Regime 1	Regime 2	Regime 3
Time	- June 2000	June 2000 - September 2000	October 2000 -
Replacement rate	high	low	high
First Sample	Early Retirement (ERRWC)	Invalidity Pension (long employment history)	
Second Sample		Invalidity Pension (all)	Invalidity Pension (all)

Fig. 1. The regimes and types of retirement.

line with this study, [Kim and Ruhm \(2012\)](#) do not find any substantial effect of bequests on health in the US. They use HRS data to analyze the influence of inheritances on health, out-of-pocket health expenditures and many other factors. Corresponding to the absent effect on health they find only minor effects on out-of-pocket health expenditures and medical services, and “no convincing evidence” for changes in lifestyles to offset a possible positive effect.

In their meta study, [Cutler et al. \(2006\)](#) conclude, with regard to the determinants of mortality within countries, that it “seems clear that much of the link between income and health is a result of the latter causing the former, rather than the reverse.” (p. 115) This suggests that all those findings of quantitatively small and mostly insignificant effects are in line with their interpretation.

Switching to Austria, the European Court of Justice ruled in May 2000, that one type of early retirement violated the European law. This decision surprised the government and the public. The subsequent abolition of this retirement in June 2000 can be seen as a natural experiment. Before the abolition, in “regime 1” retirees received up to 25% more gross pension than thereafter in “regime 2”. Four months after the change, in “regime 3” the replacement rate was raised to its previous level again (see [Fig. 1](#)). Using data from Austrian social security records, I exploit these two notches to study the causal effect of income on health for elderly persons.

As a measure of health, I use the mortality rates over a period of seven years, which is a determinant of bad health for these elderly persons. In Addition, for a small proportion of the individuals, the data from the public health insurance is available. For this part of the sample, I can use the health expenditures on drugs or medical aids, visits to general or special practitioners, and hospital visits.

The Austrian social security records contain detailed information on employment histories and some information on health histories of all Austrian private sector employees. Using individuals aged 57–59 years, I compare retirees from the period January to June 2000 (regime 1) to retirees from the period June to September 2000 (regime 2) for the first regime change. Using cohorts aged 57–60, I contrast retirees from the period June to September 2000 with retirees from the period October to December 2000 for the second regime change. See [Fig. 1](#) for a time line for those comparisons and samples. All cohorts compared are exposed to the same health “risks” (epidemics, etc.) all the time.

The seven year mortality rates for these persons are not statistically different between the regimes. Only expenditures on drugs increases significantly, but all other expenses and measures like visits to a doctor or a hospital, expenditures on medical aids, etc. are unaffected.

While the question of the effect of income on health is not novel, this paper contributes to the broad literature providing evidence from a different country and a different dataset. Moreover, it provides deeper insights in the effect of income on health expendi-

tures. Some authors presume that the effect of income on health is absent, because medication is covered by public health insurance which can be considered a substitute for any out-of-pocket payments supporting a healthy lifestyle (see [Adams et al., 2003](#)). Except for prescribed drugs at the 10 percent level, I cannot find that income is substituted with public health expenditures in Austria.

## Institutional background

### Austrian pension system

Between the 1970s and the 1990s, Austria had a generous pension system that contained various provisions for early retirement (see [Hofer and Koman, 2006](#)). In 2000, Austria spent 14.3% of its GDP on pensions ([Eurostat Statistics Database, Economic Policy Committee, 2010](#)). Although the regular retirement age is similar to that in other European countries (65 for men and 60 for women), the actual retirement age of men decreased steadily from nearly 62 in the 1970s to about 58 in 1995. Since then, it has increased slightly to 58.5 in 2000 and has stagnated around 59 since 2005 ([Hauptverband der österr. Sozialversicherungsträger, 2010](#)). The large share of pension expenditure in the GDP and the low retirement age is accompanied by one of the lowest labor force participation rates of elderly men and women amongst the OECD countries ([Organisation for Economic Co-operation and Development, 2006](#)).

In Austria, the number of years insured (the contribution years) frame the basis for the replacement rate of pension benefits. In the relevant period, pension payments were calculated on the basis of the average monthly earnings in the best 15 years of contribution with an average net replacement ratio of 75% ([Organisation for Economic Co-operation and Development, 2005](#)).<sup>1</sup>

### Invalidity pension versus early retirement due to reduced working capacity

In 1993, the Austrian government introduced multiple new provisions for early retirement. One of these was the “Early Retirement due to Reduced Working Capacity” (ERRWC). This provision was introduced for older workers with reduced working capacity as another form of retirement along with the invalidity pension. The main difference between the two schemes is a higher replacement rate for the workers retiring under the ERRWC (*details later*). The introduction was announced several months before, and hence, individuals could have adapted easily by postponing their

<sup>1</sup> A detailed description of the calculation of pension benefits in the Austrian pension system can be found in [Manoli et al. \(2009\)](#).

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