



The effect of health on earnings: Quasi-experimental evidence from commuting accidents[☆]



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HIGHLIGHTS

- We interpret commuting accidents as negative health shocks.
- The aim is to identify the causal effect of health on labor market outcomes.
- A DiD-estimation based on a sample of matched treated and control workers is used.
- Treated are more likely unemployed and leave the market via disability retirement.
- Treated, who manage to stay in employment, incur persistent earnings losses.

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ABSTRACT

This paper interprets accidents occurring on the way to and from work as negative health shocks to identify the causal effect of health on labor market outcomes. We argue that in our sample of exactly matched injured and non-injured workers, these health shocks (predominantly impairments in the musculoskeletal system) are quasi-randomly assigned. A fixed-effects difference-in-differences approach estimates a negative and persistent effect on subsequent employment and earnings. After initial periods with a higher incidence of sick leave, injured workers are more likely to be unemployed, and a growing share of them leave the labor market via disability retirement. Injured workers who manage to stay in employment incur persistent earnings losses. The effects are somewhat stronger for sub-groups of workers who are typically less attached to the labor market.

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1. Introduction

A positive correlation between health and socio-economic status is well documented in social and medical sciences.¹ However, a considerable debate about the causal underpinnings of this relationship remains. The identification of causal effects has proven to be extremely difficult (Deaton and Paxson, 1998; Goldman, 2001; Fuchs, 2004). Due to the nature of the problem randomized experiments are mostly not feasible and/or not appropriate. Thus, scholars have to rely on natural experiments in order to identify causal effects.² A small number of papers have managed to establish a causal effect of income on health.³ In sum, these papers (all studying data from developed countries) find positive but quantitatively small effects of income on (mental) health.

An even smaller number of papers explore the causal effect of health on income. It seems even harder to find and to measure arguably exogenous variation in health compared to income. Wu (2003) argues that severe health conditions – such as strokes, cancer or diabetes – can be interpreted as exogenous health shocks. In a similar vein, Riphahn (1999) defines a negative health shock as a sudden and substantial drop in subjective health, Wagstaff (2007) uses a substantial drop in the body mass index, and García-Gómez et al. (2011) exploit acute hospitalizations. However, there are some doubts regarding the exogeneity of such events. For instance, Charles (2003) analyzes the dynamic effects of a disability on earnings and finds that earnings have already dropped one year before the onset of the disability. A different approach is given by accidents. Reville and Schoeni (2001) and Crichton et al. (2011) study the effects of workplace (and non-workplace) accidents on employment and income, and Møller Danø (2005) estimates the effect of severe road accidents on labor market outcomes and public transfers.⁴ The evidence presented in these papers is somewhat mixed, which may be explained by varying types of accidents used; however, shows by and large the negative effects of accidents on subsequent labor market outcomes.

In this paper, we follow a similar approach; however, we focus on a special type of accident. We interpret accidents occurring on the way to and from work (such as road accidents, slip and fall accidents and injuries due to falling objects) as negative health shocks. This has a number of attractive features: (i) the way to and from work is part of the daily routine of every employed individual and is (in contrast to general road accidents) not affected by leisure time activities, (ii) the likelihood of such a commuting accident is (as compared to a workplace accident) not related to self-selection into certain jobs, offering compensating wage differentials for hazardous workplace environments, and (iii) due to an institutional detail of the Austrian mandatory social accident insurance we can observe the universe of commuting accidents in Austria, and link these to the *Austrian Social Security Database*, a linked employer–employee data-set.

Still, there are some determinants of the likelihood of a commuting accident that may also affect labor market outcomes. Preferences for working at (or close to) home, for living in an urban or rural area, or for certain means of transportation for the work commute (such as train or bike) may affect selection into certain jobs. Some of these

potential confounding factors are observable in our data. For instance, given an additional link to data from the tax register we observe the commuting distance for each individual. In order to account for remaining unobserved heterogeneity we follow Heckman et al. (1997) – who have shown that in the presence of longitudinal data, matching and differencing can be fruitfully combined to weaken the underlying assumptions of both methods – and compile a sample of matched treated and control individuals, who share an observationally identical (labor market) history. Thanks to our rich data – before and after the treatment – we can address the usual concerns about this approach. Most importantly, we find strong evidence for a common trend in pre-treatment labor market outcomes across injured and non-injured units (*common trend assumption*). Based on data from a mandatory health insurance, we can further show that the two groups have been following the same trends in objective health outcomes before the treatment. We argue that within our research design commuting accidents are quasi-randomly assigned, and constitute negative health shocks that enable us to establish a causal effect of health on employment and labor market income (henceforth earnings).

Which type of health shocks do commuting accidents generate? While we have no information on the type of injuries in our individual level data, we can resort to aggregate statistics.⁵ These show a wide range of injuries: head and neck (31%), trunk (16%), upper limbs (11%) and lower limbs (18%), potentially accompanied by mental stress. That means, our health shocks are predominantly impairments in the musculoskeletal system. Clearly, our research design does not allow us to infer on the effects of typical lifestyle diseases, such as cardiovascular diseases, strokes or cancer. However, it is hard to think of exogenous variation in the incidence of these lifestyle diseases.

Our estimation results show that negative health shocks (i.e., predominantly impairments in the musculoskeletal system) that result in an initial average sick leave spell of 46 days, reduce the likelihood of subsequent employment persistently. Five years after the commuting accident, injured workers are still about four percentage points less likely to be employed. Initially the accident increases the likelihood of sick leave, then injured workers are more likely to be unemployed, and over time a growing share of them leave the labor market via disability retirement. The injured workers who manage to stay in employment experience persistent earnings losses of about minus two percent. The size of the estimated effects varies along the dimensions of sex, occupation, and age. Employment effects are strongest for female, older and blue-collar workers. The highest earnings losses (up to minus three percent) are observed for young workers. While we do not observe much adapting behavior of injured workers in terms of job mobility, we find evidence that injured female workers adjust their fertility behavior in response to the negative health shock.

The remainder of the paper is organized as follows: first, we discuss our research design and outline relevant institutional facts. This section also describes the data and provides descriptive statistics for our estimation samples. The next two sections explain our estimation strategy and discuss the identifying assumption. Subsequently, we present our estimation results for all workers and explore heterogeneous treatment effects along the dimensions of sex, occupation and age. We also examine potential adapting behavior and provide a discussion on the channels through which injured individuals leave the labor market. The final section summarizes and concludes the paper.

¹ For a review of this literature, see, for instance, Strauss and Thomas (1998) and Smith (1999).

² A notable exception of an experimental setting is given by Thomas et al. (2006).

³ On an individual-level scholars exploit exogenous variation in income due to inheritances (Meer et al., 2003), lottery winnings (Lindahl, 2005; Gardner and Oswald, 2007; Apouey and Clark, 2010) and the German reunification (Frijters et al., 2005). Based on cohort data Adda et al. (2009) use changes in income mainly related to changes in the macro-economic environment. The identification of Michaud and van Soest (2008) comes from dynamic linear panel data techniques.

⁴ Relatedly, Lindeboom et al. (2007) use accidents of any type (reported by survey respondents) as an instrument for disability status to study the effect of a disability on employment.

⁵ Note, aggregate injury statistics are only available for accidents with subsequent hospitalization and do not distinguish between commuting accidents and all other road accidents. Source: *Kuratorium für Verkehrssicherheit. Freizeitunfallstatistik 2007*.

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