Health shocks, disability and work☆

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HIGHLIGHT

- Exploits unscheduled hospitalizations as unanticipated health shocks in event-history model.
- Health shocks substantially increase disability risk, but no direct effect on employment.
- Finds sizeable (local average treatment) effect of onset of disability on employment.
- Effects larger for men and low-educated workers.

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ABSTRACT

This paper focuses on the relation between health shocks and the onset of a disability and employment outcomes. We estimate an event-history model using data from the British National Child Development Study (NCDS), where accidents causing a unscheduled hospitalization are the measure for unanticipated health shocks. Our results show that experiencing such a health shock substantially increases the likelihood of the onset of a disability, while it does not have direct effects on employment at later ages. This finding is used to simulate the causal effects of the onset of a disability on later employment outcomes. These simulations show that about two-third of the association between disability and employment can be explained by the causal effect of the onset of a disability on employment. The remaining one-third is selection. For men and lower-educated workers the association is mainly explained by the causal effect, while for women selection is more important.

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1. Introduction

A substantial share of the working age population in the industrialized world suffers from a long standing illness or disability that restricts in daily activities and/or work (Dupre and Karjalainen, 2002). Disability prevalence rates are already high at relatively young ages. For instance, in the UK around 5% of the 20–24 year old have a long standing disability and this number increases to around 13% for the 40–44 year old and 28% for those aged 55–59 (Berthould, 2006). Similar disability rates are found for the US (Kapteyn et al., 2007). Disability is associated with higher benefit take up, poverty and lower employment rates.

This paper focuses on the causal effect of the onset of a long standing illness or disability on employment. Employment rates are much lower for disabled workers. For instance, according to the UK Department for Work and Pensions in 2012, 46.3% of the working age disabled were employed, while this was 76.4% for the non-disabled. Similar employment gaps exist for other countries (e.g. Von Gaudecker et al., 2011, for the Netherlands). This large employment gap is of direct importance for policies that intend to prevent the onset of disabilities and to increase the labor market prospects of people with disabilities, such as the UK's Disability Discrimination Act (DDA) or the Americans with Disability Act (ADA). Deleire (2000), Acemoglu and Angrist (2001) and Hotchkiss (2003) study the employment effects of the ADA and Bell and Heitmuller (2005) the employment effects of DDA. If the size of the causal effect of disability on employment is large, then the potentials for programs aiming to reduce the impact of disability on employment are large. DDA and ADA are examples of such programs. Besides disability, an individual's employment status strongly depends on demographic and socioeconomic factors. Therefore, for policy purposes it is important to know how much of the difference in

employment rates of disabled and non-disabled workers can be ascribed to background characteristics and how much to the direct causal effect of disability.[1]

The issue is also of interest for the large literature on the association between socioeconomic status and health (see e.g. Smith, 1999, for a survey). Even though many economic and epidemiological studies have established a strong positive association ('gradient') between health and socioeconomic status, little is known about causal mechanisms. Assessing causal relations with observational data is non-trivial. Not only may there be direct effects of health (disability) on socioeconomic status and the other way around, but also unobserved individual specific effects can relate to both health and work. Therefore, independent variation in health is required to assess its causal effect on work.

We use accidents that have caused a visit to a hospital, an outpatient facility or a casualty department as a measure for unanticipated health shocks. These accidents include, for example traffic accidents, work place accidents, heart attacks and sport injuries. Such health shocks contain new information to the individual and thereby provide some unanticipated variation. We use this information to identify our model for health shocks, disability and work and subsequently use the model to simulate the causal effect of disability on employment and on the importance of this causal effect in explaining the employment gap that exists between the disabled and the non-disabled model. The unanticipated nature of the shocks is important for the identification of the model, but in our context this only means that the exact timing of the accident is not known in advance. It does not rule out that individuals may be aware that at some moments the risk of experiencing an accident may be higher than in other periods, for instance because this risk depends on current employment status. Also we do not require accidents to be exogenous, conditional on observable characteristics. To be a bit more specific about the model, we construct a discrete-time discrete-choice model for accidents, disability and work. The transition rates between disability and work states can be affected by accidents and accidents can in turn be influenced by the individual's employment and disability status. The three endogenous variables of the model are related via unobserved components that remain fixed across time. Identification of this kind of models has been discussed extensively by Abbring and Van den Berg (2003) and Heckman and Navarro (2007).

Our approach relates to a growing literature that uses (natural) experiments to identify causal relations between socioeconomic status and health. For instance, Lindahl (2005) used lottery prize winners and Snyder and Evans (2006) used changes in the social security law to assess the causal effect of income on health. They find small effects of income on health. This is in agreement with Case and Deaton (2005) and Smith (1998), who conclude that the larger part of the association between health and socioeconomics status at middle and older ages is driven by an effect of health on socioeconomic status, rather than the other way around. Møller-Danø (2005) uses a propensity score and a difference-in-difference matching method to estimate the causal effect of road injuries on income and employment. She finds short and long-run effects of road accidents on employment status for men, but not for women. Lechner and Vasquez-Alvarez (2011), García Gómez and López Nicolás (2006) and Garcia-Gomez et al. (2013) use matching methods to identify the effects of work limitations on employment and income. These papers find significant negative effects of health on employment and income. There are some studies in development economics that use field experiments to assess the effects of interventions affecting health on socioeconomic outcomes. For instance, Miguel and Kremer (2004) evaluate a program of a school-based treatment with a deworming drug in Kenya.

We estimate our model using data from the British National Child Development Study (NCDS). The NCDS is a longitudinal study of around 17,000 individuals born in Great Britain in the week of 3–9 March 1958. These individuals are followed from birth up to the year 2000, when they were 42 years old. At age 40 already about 12% of the respondents face a permanent disability and about 29% of these disabled are out of work. In the full sample the association between disability and employment (the employment gap) is almost 23%-points. Our results show that a health shock causally increases the probability of the onset of a disability with 172%. However, because the health shocks are rare events, the larger part of the onset of disabilities come from a gradual deterioration in health. Furthermore, we find that health shocks affect an individual's labor market status only indirectly through the onset of a disability. Model simulations show that the causal effect of the onset of a disability at age 25 on the employment rate at age 40 is − 0.144. We find large differences between males and females and high and low educated workers. Male employment rates at age 40 are about 23%-points reduced due to a disability, while for females this is 12%-points. Employment rates at age 40 of low educated workers are reduced with 21%-points, while for high educated workers this is only 9%-points. We show that in the complete sample about two-third of the association between disability and employment can be explained by the causal effect of the onset of a disability on employment. The remaining one-third is selection. However, for women selection is more important in explaining the association, while for men and lower educated workers the association is mainly explained by the causal effect from disability to work.

The structure of the paper is as follows. Section 2 discusses the theoretical background and the empirical model. Section 3 introduces the NCDS data and reports on the variables used in the empirical part. Empirical results are discussed in Section 4. Section 5 concludes.

2. Theoretical background and the empirical model

Health production models (Grossman, 1972) or related models (e.g. Cropper, 1977; Ehrlich and Chuma, 1990; Sickles and Yazbeck, 1998; Case and Deaton, 2005) assume that individuals inherit an initial stock of health, which depreciates with age and increases with health investments. Individuals are rational agents who include expectations about their health when making health investments (such as health care consumption and work). If health trajectories are predictable, individuals anticipate that and change their behavior accordingly. So an observed change in labor market status that precedes a health transition can be the result of anticipated behavior rather than labor market status causally affecting health. An unforeseen shock contains new information to the individual and thereby provides some unanticipated variation in health that is unrelated to work status.

In this paper, we consider accidents as unanticipated health shocks providing new information to the individual. We will be more specific about the definition of accidents in the next section when we discuss the data. Such a health shock may cause the onset of a permanent disability or chronical condition. Here our approach differs from, for example, Smith (2003) and Adams et al. (2003) who use the onset of a chronic condition as a measure for health shocks. Health shocks occur at different moments in life and, therefore, our model should be dynamic. A dynamic model also has the advantage that we can substantially relax the requirements for accidents to be valid health shocks. Within our dynamic model we do not restrict health shocks to be exogenous. Instead we explicitly model the occurrence of a health shock and allow unobservables to affect jointly the probability of experiencing a health shock, the onset of disabilities and labor market outcomes. No anticipation of health shocks means that people cannot fully predict the exact *timing* of the occurrence of such a shock. An intuitive justification of this assumption is that if people would know the exact timing of having an accident in advance, it would be easy to circumvent having

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[1] Like most studies in the field we focus on self-reported disability measuring restrictions in daily life (i.e. Berthould, 2006; Currie and Madrian, 1999). This avoids a mechanical effect which disability insurance benefits receipt has on employment.