



Smoking and early retirement due to chronic disability

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ABSTRACT

This paper considers the long-term effects of smoking on disability retirement in Sweden. Smoking is known to have damaging effects on health, but there is limited evidence on how the effects of smoking translate into worse labour market outcomes, such as the inability to work. In contrast to the few previous studies on smoking and disability retirement, we use a large population sample with registry information on smoking, which is recorded for all women who give birth in Sweden. Thanks to these comprehensive data, we are able to account for a much broader range of potential confounders. In particular, by the use of sibling and twin fixed effects, we account for unobserved heterogeneity in childhood environment and family characteristics. Given that smoking is often initiated in adolescence, one would suspect such factors to play important roles.

Among individuals aged 50–64 in 2011, a simple model suggested smokers to have a 5 percentage point higher probability of receiving (full) disability pension, making them more than twice as likely as non-smokers to receive this. However, in a model with sibling fixed effects, the size of the effect was reduced by more than a third. The results point to the importance of confounders, such as childhood circumstances or behaviours, which were not accounted for by previous studies. We also consider effects on disability due to different health conditions. In relative terms, effects are the largest for circulatory conditions and tumours. Results are largely driven by health problems severe enough to merit hospitalization, and there is no evidence of a role played by financial incentives.

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1. Introduction

Smoking is strongly associated with worse health outcomes, and smoking is often referred to as 'the leading preventable cause of premature disease and death' in developed countries (e.g. USDHHS, 2014). Compared to pure health outcomes, evidence on labour market outcomes, such as the ability to stay in the labour force in old ages, is sparser. As populations grow older and policy-makers seek to consolidate public finances by making people stay in the labour force longer, a precise understanding of the effects of smoking on work ability becomes crucial. This study contributes to the understanding of this issue by estimating smoking's effects on disability retirement, using a large data set which allows us to account for a broader range of potential confounders, such as family background.

Based on surveys and clinical data, the medical literature has in particular provided strong evidence that smoking increases the risk of cancer (Gandini et al., 2008), respiratory disease (Jayes et al., 2014) and cardiovascular disease (Mons et al., 2015). Mortality from these conditions is drastically higher among smokers, and smokers die about 10 years earlier than non-smokers do (Doll et al., 2004; Prabhat et al., 2013). Effects on diseases such as diabetes (Chielero et al., 2008), various musculoskeletal conditions (Murray, 2014) and eye disease (Kelly et al., 2005) have been documented as well. There is evidence that mental conditions including anxiety and depression are affected by smoking (Banham and Gilbody, 2010; Taylor, 2014), but it is possible that causality runs in both directions.

Former smokers tend to have better health outcomes than current smokers, and light smoking tends to be better than heavy smoking. The exact patterns vary across diagnoses and settings, however (Murray, 2014; USDHHS, 2014). In terms of overall mortality, studies suggest that most of the excess mortality risk is

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eliminated in individuals who quit smoking before age 40 (Doll et al., 2004; Prabhat et al., 2013; USDHHS, 2014).

Associations between smoking and income, sick-leave or disability pension have been estimated by a rather small number of studies, using survey data. In the U.S., current smokers have been found to earn 4–8% less than non-smokers (Levine et al., 1997). In Canada, they earned 8% less (Auld, 2005) and in the Netherlands 10% less (van Ours, 2004), although in the latter study this effect was confined to men only. Smokers also have lower life-time income than others (Böckerman et al., 2015). Finally, they are more likely to be on sick-leave (Lundborg, 2007; Skillgate et al., 2009) and to receive disability pension (e.g. Eriksen et al., 1998; Husemoen et al., 2004; Haukenes et al., 2013; Lallukka et al., 2015).

Because of small data sets and limited availability of control variables, almost all studies on the effects of smoking on disability pension have been unable to distinguish between smoking and confounders such as childhood environment and family background. The failure to account for these factors is worrisome, since there are well-known links between smoking and, for example, the absence of one or two parents during upbringing, parental smoking and other unobserved factors that are shared between siblings (Isohanni et al., 1991; Gilman et al., 2008; Baska et al., 2010; Melchior et al., 2010). To the extent that the same factors influence individual health, capacities and other traits that in turn influence the propensity to stay in the labour market, a bias in the estimates of the effect of smoking will arise – unless sibling or twin comparisons are being made. A few papers using Finnish twins (Koskenvuo et al., 2011; Ropponen et al., 2013; Korhonen et al., 2015) have considered smoking's effect on disability retirement, applying duration models and exploiting smoking differences within twin pairs. As the analyses were confined to surveys on twins, samples were relatively small, even before attrition, but significant effects were found. With the exception of (Korhonen et al., 2015), these studies only considered disability retirement due to particular diseases.

In contrast to all previous studies on smoking and disability retirement, we are able to exploit a comprehensive sample, covering all women who have given birth (and were, for this reason, asked about their smoking habits). This large data, including more than 80,000 sisters, allows us to extensively account for confounders, while still producing estimates of high precision. In particular, family background is accounted for by comparing outcomes of siblings as well as twins. Whereas comparison of twins has the advantage that we may be able to more fully account for genetic and environmental factors, the comparison of siblings enables us to exploit a much larger and likely more representative sample.

We exploit information from the Swedish Medical Birth Register, which has recorded smoking habits among all women who have given birth since 1983. The data have been linked to a range of national registers with information on health and labour market outcomes. As an additional contribution, we contrast the effects on disability retirement due to different types of diagnoses. Disability retirement is observed on average two decades after the smoking information is recorded, implying that our focus is on the long-term effects of mid-life smoking.

We find a strong correlation between smoking and disability retirement. However, our results suggest that much of the overall relationship is due to confounders such as family background, implying severe bias in most previous studies. In particular, between a third and half of the effect disappears when sibling fixed effects are controlled for. Our results can be partly explained by health problems severe enough to merit hospitalization, and there is no evidence that smokers enter disability retirement because of their lower labour incomes.

2. Materials and methods

2.1. Institutional setting

In Sweden, disability pensions are granted to individuals who are below age 65 and who are deemed incapable of ever working full time, due to illness, injury or other disability. Disability may affect an individual's work capacity only partially, and in that case a quarter or a half of full-time pension may be paid out. However, a majority of those who receive disability pension receive the full-time amount and are thus not working.

The requirement that the disability is of a permanent nature is quite strict, and has been so since 2008, when the disability pension system was reformed. With this reform, temporary disability pensions were abolished, and the medical requirements were made stricter. The determination of eligibility is based only on the individual's work capacity, and factors such as age and previous employment are not taken into account.

To apply for disability pension, the individual normally needs a doctor's certificate, with a description of their illnesses and functional limitations, and a judgement that the individual is unable to carry out any work in the foreseeable future. However, the Social Insurance Agency, the agency responsible for paying out disability pensions, is not bound to follow the doctor's recommendation, and may deny the application, or may demand more evidence on the condition. Such evidence may include a judgement from another doctor, information from a former employer or from the individual himself.

For individuals who were employed prior to obtaining disability pension, the (gross) amount is calculated as 64.7% of the average income during the last few years. Only incomes up to a certain level are counted, however, and in 2011 this ceiling was set at SEK 321,000 (USD 50,000). Thus, no disability pensions higher than SEK 207,687 (USD 33,000) were paid out on a yearly basis.

For individuals who were not previously employed or had a low income, a minimum disability pension is granted. This amounted to SEK 102,270 (USD 16,000) in 2011. In addition to this, housing benefits covering up to 93% of the rent for a reasonably cheap apartment can be applied for.

While disability retirement is the most common route to retirement before age 65 in Sweden, old-age pension may be obtained from age 61. Individuals can start claiming their old-age pension without losing their disability pension. Other income sources that may be available to individuals who do not receive labour income include unemployment benefits (can be obtained for up to 300 days) and sickness benefits (from 2008 this is generally restricted to 550 days). Individuals not qualifying for any social insurance benefits may obtain social assistance, which in terms of the amount is comparable to the minimum levels of compensation in the disability, sickness and unemployment insurance systems.

2.2. Data

We use the Swedish Interdisciplinary Panel (SIP), administered by the Centre for Economic Demography, Lund University, Sweden. The database is obtained from Statistics Sweden (*Statistiska centralbyrån*) and comprises several national registers covering the entire Swedish population. These include the Medical Birth Registry and the Patient Registry from the National Board of Health (*Socialstyrelsen*), the Tax Registry, the Education Registry and a register with information on disability pension spells from the National Agency for Social Insurance (*Försäkringskassan*). Siblings are identified as having the same biological mother and twins are identified as being siblings with the same year and month of birth. One limitation is that we are not able to distinguish between

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