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The effect of job loss on pharmaceutical prescriptions☆

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ABSTRACT

We estimate the effect of job loss on the probability that long-tenured workers are prescribed anti-hypertensive and psychotropic drugs. We exploit two administrative data sources from the Veneto region in Italy and estimate an event-study model. Our results indicate that the probability of drug prescription increases among under-40 males but not among older males or female workers. We suggest that the effect on younger male workers is the combined result of their typical role as breadwinners, limited wealth buffers in case of layoff, and unfavourable employment legislative protection.

1. Introduction

An ample literature in economics, public health, and psychology has analysed whether job loss worsens workers' health. Dismissed workers can face significant temporary or permanent declines in earnings, increased uncertainty, and vulnerability to other adverse life events, besides losses of work relationships, self-esteem, sense of control, meaning in life, and experience. All these factors are causes of acute stress (Brand, 2015), which is an important risk factor for several diseases (McEwen and Stellar, 1993), particularly circulatory diseases (Steptoe and Kivimäki, 2012, 2013) and mental illness, as well as self-destructive behaviours like alcohol abuse and suicide (Kasl and Jones, 2000).

The association between job loss and workers' health is well-documented, but finding an association is not enough to identify a causal effect of the former on the latter (Burgard et al., 2007). For instance, the opposite might also be true – health deterioration may increase the probability of dismissal - and, depending on their health conditions, workers might self-select into occupations and sectors with different probabilities of layoff. Therefore, in order to identify the causal effect of job loss on health one may want to focus on dismissals that are independent of workers' characteristics, such as plant or business closures or collective layoffs. The literature that adopts this strategy provides mixed results. Among the papers that study the effect on mortality, most find an above-normal mortality risk after job loss (Browning and Heinesen, 2012), which is mainly attributed to the dismissal-related decline in income (Sullivan and von Wachter, 2009) or alcohol-related conditions and suicides (Eliason and Storrie, 2009). The evidence of a causal effect is mixed for physical or mental health conditions (Salm, 2009; Michaud et al., 2016), and contrasting results are obtained even using the same data sources (see Schmitz, 2011 and Marcus, 2013). Some papers find that the most vulnerable subjects are those who had the worst conditions at the baseline (Schiele and Schmitz, 2016). As for health behaviors, there is some evidence of increased smoking or smoking initiation (Marcus, 2014; Black et al., 2012), alcohol-consumption and over-eating among workers who were already pursuing unhealthy behaviors before job loss (Deb et al., 2011). Out of the stream of literature that exploits the exogenous-layoff-strategy, the study that we consider the closest to ours is the one by Kuhn et al. (2009), who

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analyse (expenditure on) pharmaceutical prescriptions in Austria. By matching dismissed and non-dismissed workers and following them over-time, they find an increase in spending on psychotropic and psychosomatic drugs among male workers after job loss.

We exploit plant closures and collective layoffs to estimate the effect of job loss on the probability that workers are prescribed anti-hypertensive and/or psychotropic drugs in three health districts of Veneto, an Italian region among the richest and most industrialised in the country. We merge at the individual level two administrative datasets, one that records all the layoffs occurred in Veneto between 2008 and 2011 and another one, unique, that collects all the pharmaceutical prescriptions issued in three health districts in Veneto – Padova, Rovigo, and Venice – between 2007 and 2012. We focus on prescriptions for anti-hypertensive and psychotropic drugs, which are typically used to treat stress-related diseases.

The use of prescriptions is particularly appropriate because they reflect the diagnosis of a medical doctor. Hence, prescriptions constitute a source of information much more reliable than self-reported measures of health, which might be affected by a number of biases – not least of which a downward "justification" bias (Bound, 1991) for workers who attempt at justifying their exit from the labor market.

We focus on workers in the private sector with a tenure of at least one year (and on average much longer), as we expect job loss to be more stressful for those who are little accustomed to search for new jobs and adapt to new occupations. These workers are followed throughout 23 to 30 consecutive two-month periods (bimesters, henceforth) starting on March 1, 2007, and for each bimester we record whether the worker was prescribed anti-hypertensive and/or psychotropic drugs and whether he or she was dismissed. This setting allows us to estimate a flexible event-study model with individual and bimester fixed effects that identifies the effect of job loss by comparing the trends in medical prescriptions between dismissed workers and a pooled sample composed of never-dismissed and not-yet-dismissed workers.

We find that job losses due to plant closure and collective layoffs do not significantly affect the probability of being prescribed anti-hypertensive or psychotropic drugs for either male or female workers who were between 25 and 50 years old at the baseline year (2007). However, the absence of average effects masks some interesting heterogeneity. We observe a significant and relatively strong increase in the consumption of anti-hypertensives among younger male workers. There is also some evidence of an increase in the consumption of psychotropic drugs, although less precisely estimated. No effect whatsoever is detected among more senior male workers and females (of any age). We prove the robustness of our results through a test of balancing, a placebo test, and various alternative specifications of the model. It is also worth remarking that pharmaceutical expenditures in Italy are covered almost entirely by the National and Regional Health Services, so the effect of dismissal that we observe is not contaminated by the loss of labour earnings.

We interpret such heterogeneity in the effect of job loss as a direct consequence of young men being the most vulnerable to adverse shocks in the work domain.

In the vast literature on the health effects of job loss, our paper positions itself among the very few (Sullivan and von Wachter, 2009; Kuhn et al., 2009) that conduct their empirical analyses using administrative data and therefore provide results that are credibly shielded from measurement error concerns. However, compared to many other works including Kuhn et al. (2009), the closest to ours, our empirical strategy requires a significantly milder version of the conditional independence assumption to address the problem of selection. Furthermore, we are the first – to the best of our knowledge – to study Italy in one of its most economically lively regions, which was also one of the most harshly hit by the economic crisis started in 2008, by means of a unique match between labour and health administrative data at the individual level.

The remainder of the paper is organized as follows. Section 2 provides a brief background on the employment-protection rules and pharmaceutical prescriptions in Italy. Section 3 describes our data, and Section 4 illustrates the empirical model. Section 5 summarizes the results, and Section 6 illustrates the results of our tests. Conclusions follow.

2. Background: employee dismissal in Italy and the national health system

2.1. Employment protection

Dismissals in Italy are regulated by a complex set of norms and procedures – mainly law 300/1970 (*Statuto dei lavoratori*) and law 223/1991 – that were reformed in 2012 and 2014, making – among the other things – dismissals easier and less expensive. Although discriminatory dismissals are invalid, employers have some discretion in deciding which employees they want to dismiss. Hence, employers might lay off workers in poor health if they are less productive than healthier ones, which poses a problem of selection in the estimation of the effect of job loss on health. To address this concern, we focus on dismissals due to plant or business closure (*licenziamento per cessata attività*) and collective dismissals (*licenziamenti collettivi*), where selection is plausibly absent or minor. Both types of dismissal are characterized by the simultaneous resolution of multiple work contracts, apply only to firms with more than fifteen employees, and are allowed only if certain conditions are met. In plant or business closures all employees are dismissed as the plant is no longer economically viable for economic or organizational reasons. In collective dismissals at least five workers are dismissed (typically due to production downsizing), but the firm survives. Selection is absent by definition in closures, and *de facto* absent also in collective dismissals because employees to be fired are selected through exogenous criteria based on their tenure, responsibility for dependents, and age (art. 5 law 223/91).

Over the period analysed in this study (2008–2011) both types of dismissal gave the right to receive a monetary indemnity that lasted twelve months for workers under age forty, twenty-four months for workers between age forty and forty-nine, and thirty-six months for workers aged fifty or older. The indemnity was roughly equal to 80 percent of the regular wage for the first twelve months and to 64 percent afterwards.

2.2. Drug prescription

In Italy, regions are primarily responsible for the regulation and organization of the health care services. The central government establishes the minimum standards, supervises the regional activity, and negotiates the prices and characteristics of the drugs that enter the national drugs formulary (*prontuario farmaceutico nazionale* – PFN). The National Health Service is in charge for the PFN. Patients whose family doctors prescribe a drug listed in the PFN are required to make a small co-payment of no more than 4 euros per prescription. The usual co-payment amounts to 2 euros, whereas no co-payment is due when the patient has a chronic disease, is invalid or elderly, or low-income. In our analysis we focus on prescribed drugs exclusively.

The regional health system is organized territorially in health districts (*Aziende Sanitarie*), defined according to proximity and population size. The three districts considered in this paper serve three important urban areas in Veneto and their surroundings.

3. Data

We merge two administrative data sources at the individual level through the social security number. The first is an archive of all pharmaceutical prescriptions issued by the family doctors who operate in the health districts of Venice, Padova, and Rovigo, harmonised and maintained by the Laboratory of Public Health and Population Studies