



The effects of chronic non-communicable diseases on labour force outcomes: Quasi experimental evidence from Sri Lanka

Ajantha Sisira Kumara^{a,b,*}, Ramanie Samaratunge^b

^a Department of Public Administration, University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka

^b Department of Management, Monash Business School, Monash University, Menzies Building, Level 11, Clayton Campus, Victoria, 3800, Australia



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ABSTRACT

We investigate the effects of experiencing non-communicable diseases (NCDs) on labour force outcomes of working-age individuals and their households in Sri Lanka. For this, quasi-experimental evidence, including average treatment effects on those treated (ATT), are generated by using the self-reported health survey of the labour force of Sri Lanka. According to the analysis, individuals with at least one NCD account for approximately 19.15% of the working-age population. On average, employment probability, labour supply, and labour earnings of them are significantly lower than those of non-NCD individuals by 9.5% (ATT=−0.102, $P < 0.001$), 44.6% (ATT=−0.590, $P < 0.001$), and 47.9% (ATT=−0.652, $P < 0.001$), respectively. The negative impacts on labour force outcomes are notably larger in the cases of paralysis and mental illness. These NCDs reduce individual labour supply by more than 80% and labour earnings by more than 90%. The employment probability of individuals with paralysis and mental illnesses is also relatively lower by more than 60%. Apart from these individual-level effects, the paper provides evidence on how labour force outcomes at the household level are influenced by NCDs. Our findings demonstrate that the association between individuals' NCD-prevalence and labour force outcomes is relatively stronger for males, informal sector employees, and elderly people. The results suggest several social inclusion policies.

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1. Introduction

Health plays an important role for labour supply decisions of individuals, because individuals' potential to fulfil their job requirements is strongly linked with their health conditions (Cai et al., 2014). In accordance with the fundamentals of Human Capital Theory, improvement of emotional and physical health of individuals is a worthy investment (Becker, 1962): it is evident that healthy individuals perform better at their jobs, work longer hours and earn higher wage relative to individuals with ill-health. The studies to date on the causal link between health and labour force outcomes are voluminous. However, most focus on specific sub-groups of the population or specific types of ill-health conditions and produced mixed-results.

Abegunde and Stanciole (2008) showed that household income in Russia is negatively affected by ill-health measured in terms of number of family members reported suffering from

chronic and non-chronic diseases. Goryakin and Suhrcke (2017) supported these findings confirming that the negative impact of ill-health on labour supply increases for an array of conditions, including myocardial infarction, stroke, and diseases of heart, liver, lung, and kidneys. Rodríguez-Sánchez and Cantarero-Prieto (2017) added empirical evidence from Spain on the impact of diabetes on labour force outcomes; diabetes is not significantly associated with employment probabilities, but with labour supply and income of Spaniards. Elsewhere, Olesen et al. (2013) examined the two reciprocal associations between unemployment and mental illnesses using an Australian household survey: it was evident that poor mental health has been both a consequence and a risk factor for unemployment there. Cai et al. (2014) further revealed that ill-health resulted in fewer labour hours in Australia; they defined ill-health of individuals on the basis of whether or not they have ever had long-standing health conditions: they also found that males with ill-health reduced hours worked more than do their female counterparts.

Labour market consequences of ill-health is studied in terms of spill over effects: the effects of ill-health of a household member on other household members' labour force outcomes. It is argued that

* Corresponding author.

E-mail addresses: mhasisira@sjp.ac.lk (A.S. Kumara), ramanie.samaratunge@monash.edu (R. Samaratunge).

the spill over effect is theoretically ambiguous and produces mixed empirical results (Garcia-Gomez et al., 2013). For instance, other household members may substitute for lost-earnings of the ill-health member, which is known as the added-worker effect (Mincer, 1962). Alternatively, they may reduce labour market activity to meet care requirements of the ill-health individual. Garcia-Gomez et al. (2013) presented the Netherlands case and showed that there were spill over effects of ill-health in terms of reduced-spouse income and household income in addition to reduced-employment probability and personal income. Similarly, households with a chronically-ill person were likely to have lower work participation in Ukraine (Murphy et al., 2013) and in Egypt (Rocco et al., 2011). Mahal et al. (2013) and Karan et al. (2014) supported this trend with their study on Indian adults. Conversely, in Brazil Mauricio-Reis (2011) argued that ill-health of self-employed worker increases the probability of the rest of the household members entering the labour force, exhibiting the added-worker effect.

Sri Lanka has not been the subject of studies on labour force consequences of ill-health, and therefore, there is a significant research gap. The reason for lack of evidence on Sri Lanka is twofold: unavailability of an island-wide survey, combining the data on individuals' labour force outcomes and health information; and the dominance focus of literature on either high-income or low-income countries, paying little attention to middle-income countries (Goryakin and Suhrcke, 2017). In order to fill this gap, the Department of Census and Statistics of Sri Lanka included a health module in the Sri Lanka Labour Force Survey 2014 for the first time in its history (Department of Census and Statistics, 2016a) and this has enabled this study. There is a pressing need to empirically explore labour force consequences of NCDs because the country is now testing the viability of various policies to prevent NCDs and to improve wellbeing of NCD-affected individuals (Kumara and Samaratunge, 2017; Ministry of Healthcare and Nutrition, 2017). The primary purpose of this study is thus to evaluate the impact that NCDs have on employment status, labour supply, and wage income at individual and household level. The study also establishes ill-health-labour outcome linkages across socio-demographic subsectors based on gender, age, and employment, enabling researchers to differentiate the impact between young and elderly groups, males and females, and formal and informal sector employees. It also provides labour force consequences for each type of NCD covered by the Labour Force Survey. As this evidence is representative of the whole country, the findings here will provide much-needed primary inputs for national policies for the health sector and labour market.

The paper contributes to the literature in four ways: First, the paper provides up-to-date and nationally representative empirical evidence on labour supply responses of working-age individuals to NCDs. It utilises the National Survey on Self-reported Health 2014, generating nationally representative empirical evidence because the survey covers urban, rural, and estate sectors of all districts. Second, the paper is based on the first-ever health survey of the Sri Lankan labour force. To the best of our knowledge, this is the first study (based on this survey) to estimate the link between health and labour force outcomes. Hence, the empirical evidence generated through this paper is novel. Third, we provide a comprehensive picture of the impact of NCDs on labour force outcomes by taking each type of NCD into account rather than limiting analysis to a particular disease or taking it in aggregated form. It allows identification of NCDs that are more influential by differentiating the labour force consequences based on disease types. Forth, the sub-group analysis is directed toward generating employment-sector-specific policies, which is limited in the literature. Due to the comprehensiveness

of the data, we have been able to estimate the labour force consequences of NCDs across employment sectors, including formal and informal sectors.

The paper is structured as follows: The next section provides a brief overview of Sri Lanka in terms of its demographic trends, NCD-prevalence of working-age people, health sector and labour market outcomes. The data and variables are then described, together with our estimation procedure and the way of checking its goodness. Next, we present our results under five subsections. Finally, we discuss the results and conclude.

2. Sri Lankan context

Sri Lanka, a South Asian lower-middle-income country, recorded its GDP per capita as 3835 USD in 2016. Annual growth was 3% in this year. The economy is now in a transition where there is an orientation towards manufacturing and services. Following its neighbouring countries in the region, Sri Lanka is moving from a predominantly rural-based to an urban economy (World Bank, 2017). Yet, Sri Lanka is also recognized as one of the fastest aging countries (Samaraweera and Maduwage, 2016), and according to the projections by the United Nations (2017), one quarter of its population will be elderly (aged 60 and over) by 2041. This has been a major driver of increased-incidence of NCDs; NCDs currently account for 85% of the total disease burden (WHO, 2015). Of working-age people (18–60 years), approximately 20% suffer from at least one NCD. This has become a serious public health issue and the WHO (2017) has expressed its great concern about the key contributing factors to this issue such as tobacco and alcohol use, unhealthy diet, physical inactivity and excessive stress. Its severity is further exacerbated by the fact that the country does not have a proper mechanism for health insurance or social security, and people therefore depend largely on limited-private insurance schemes (Kumara and Samaratunge, 2016).

Sri Lanka has a relatively large informal sector, which accounts for approximately 60% of employment (Department of Census and Statistics, 2016b). According to the Department of Census and Statistics (2016b), there should be three aspects for institutions to be in the formal sector: registration of institutions, keeping accounts formally, and employing 10 or more regular employees. Any institution, which does not satisfy any of these conditions falls under the informal sector. Yet, they are legitimate economic activities and largely operate at subsistence levels. Individuals employed in the informal sector may easily become impoverished due to NCDs because health insurance or social security arrangements are almost non-existent for these employees (Department of Census and Statistics, 2016a). Since the out-of-pocket portion of household healthcare expenditure is comparatively high in Sri Lanka (Kumara and Samaratunge, 2016), any negative impact of NCDs on labour force outcomes might hamper their utilization of healthcare, increasing the level of vulnerability. Hence, Sri Lanka provides an interesting case study for examining the labour force consequences of NCDs.

3. Research methodology

3.1. Data and variables

This first-ever, island-wide, household survey was conducted by the Department of Census and Statistics from January to December 2014. Areas covered include prevalence of NCDs and acute illnesses, healthcare utilization, health screening, smoking and alcohol usage, and health insurance. A two-stage stratified sampling procedure was adopted to form a sample of 81,376 individuals from 25,000 housing units: 2500 primary sampling

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