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The impact of diabetes on employment in Mexico

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ABSTRACT

This study explores the impact of diabetes on employment in Mexico using data from the Mexican Family Life Survey (MxFLS) (2005), taking into account the possible endogeneity of diabetes via an instrumental variable estimation strategy. We find that diabetes significantly decreases employment probabilities for men by about 10 percentage points ($p < 0.01$) and somewhat less so for women – 4.5 percentage points ($p < 0.1$) – without any indication of diabetes being endogenous. Further analysis shows that diabetes mainly affects the employment probabilities of men and women above the age of 44 and also has stronger effects on the poor than on the rich, particularly for men. We also find some indication for more adverse effects of diabetes on those in the large informal labour market compared to those in formal employment. Our results highlight – for the first time – the detrimental employment impact of diabetes in a developing country.

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1. Introduction

Diabetes, similar to other conditions that have been coined “diseases of affluence”, has traditionally been seen as mostly a problem of the developed, more affluent countries. Only in recent years the awareness has been growing of the sheer size of the problem in health terms (Yach et al., 2006; Hu, 2011). Mexico is one example of a middle-income country that has seen diabetes rates increase sharply over the last years, from about 7.5 percent in 2000 (Barquera et al., 2013) to 12.6 percent in 2013 (International Diabetes Federation, 2013). The high prevalence of diabetes in Mexico reflects an epidemiological transition from a disease pattern previously

characterized by high mortality and infectious diseases to low-mortality rates and non-communicable diseases (NCDs) affecting predominantly adults (Stevens et al., 2008). This transition has likely been reinforced by nutritional changes away from a traditional diet towards an energy dense, but nutritionally poor diet with an increasing amount of processed foods and sugars (Barquera et al., 2008; Basu et al., 2013; Rivera et al., 2004), a reduction in physical activity, as well as what appears to be a particular genetic predisposition of many Mexicans to develop type 2 diabetes (Williams et al., 2014). While many of the high-income countries may be in a position to cope resource-wise with the health care consequences of diabetes, this will be less so the case for Mexico and other low- and middle-income countries (LMICs). The most recent “cost-of-illness” estimates put the costs of diabetes to the Mexican society at more than US\$778 million in 2010, with a large part of these costs being paid out-of-pocket (Arredondo and De Icaza, 2011). While the above includes some estimate of indirect costs, meant to capture the cost burden

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attributable to foregone productivity resulting from diabetes, there exists no rigorous, econometric assessment of the effect of diabetes on employment chances for Mexico, as the research has thus far focused on high-income countries (Lin, 2011; Latif, 2009; Brown et al., 2005; Minor, 2011; Bastida and Pagán, 2002; Vijan et al., 2004; Zhang et al., 2009).

There are several reasons to expect a significant adverse effect of diabetes on employment chances in Mexico and that this effect might be stronger than in high-income countries. In Mexico type 2 diabetes is increasingly affecting people in their productive age, raising the possibility that a larger share of people with diabetes will have to cope with debilitating complications already relatively early in life (Barquera et al., 2013; Villalpando et al., 2010). Further, only a minority of Mexicans appears to successfully manage their diabetes condition, with as much as 70 percent of the people with diabetes having poor control over their disease (Villalpando et al., 2010). In addition, many Mexicans are working in the large informal economy,¹ possibly limiting their access to quality health care and hence to appropriate treatment options. All these factors are likely to both increase the risk of developing debilitating diabetes complications as well as to reduce productivity as a result. Against this background, the aim of this study is to investigate how diabetes affects employment probabilities in a middle-income country such as Mexico. To the best of our knowledge this is the first such paper on Mexico and indeed on any low- or middle-income country. We also investigate if the impact of diabetes on employment chances differs across age groups and – again for the first time in this field – by wealth, as well as between those formally and informally employed.

The majority of the more recent studies on the labour market impact of diabetes tried to account for the possible endogeneity of diabetes using family history of diabetes as an instrument. Endogeneity might arise due to reverse causality: employment status and its effect on a person's lifestyle may also influence the odds of developing diabetes. A job with long office working hours might push a person's diet or exercise pattern towards a more unhealthy and sedentary lifestyle due to reduced leisure time, increasing the person's risk for diabetes. In addition, unobserved factors, such as personal traits, could simultaneously influence a person's employment as well as his or her diabetes status and introduce an omitted variable bias. A less ambitious person could be less productive in a job, increasing the risk of being laid off, and he or she could simultaneously have only modest, if any, exercise goals or healthy eating habits, thereby increasing the chances of developing diabetes.

Brown et al. (2005) estimated the impact of the disease on employment in 1996–1997 in an older population of Mexican Americans in the United States (US) close to the Mexican border, using a recursive bivariate probit model. They found diabetes to be endogenous for women but not

for men. The results of the instrumental variable (IV) estimation suggested no significant effect on women which, compared to the adverse effect found in the probit model, indicated an overestimation of the effect for women when endogeneity was not accounted for. For men, the probit estimates showed a significant adverse effect of about 7 percentage points. Latif (2009) estimated the effect of the disease on employment probabilities in Canada in 1998. Contrary to Brown et al. (2005), he found diabetes to be exogenous for females and endogenous for males; taking this into account he obtained a significant negative impact on the employment probabilities for women, but not for men. Because the simple probit model showed a significant negative effect for males, Latif (2009) concluded that not accounting for endogeneity resulted in an overestimation of the effect on male employment chances. Minor (2011) investigated the effect of diabetes on female employment, among other outcomes, in the US in 2006. This particular study differed from earlier work in that it not only analysed the effects of diabetes in general, but also of type 1 and type 2 diabetes separately. The study found diabetes to be endogenous and underestimated if exogeneity was assumed. In the IV estimates, type 2 diabetes had a significant negative effect on female employment chances. For Taiwan, Lin (2011) found diabetes to be endogenous, with the IV results showing significant changes in the employment effect of diabetes. The impact was found to be significantly negative for men in the IV model indicating an underestimation in the standard probit model, where the diabetes coefficient was also significant but much smaller in size. For women, no significant effect was found in the IV estimation after the probit model had indicated a significant and negative impact of diabetes.

Accordingly, at least in some cases, there seems to be the risk of biased estimates of the impact of diabetes on employment, when exogeneity is assumed, with an a priori ambiguous bias. Hence, our decision in this study to also assess if diabetes is endogenous and how precisely taking account of endogeneity might affect the estimates. In order to account for this possible endogeneity we use data from the second wave of the Mexican Family Life Survey (MxFLS) from 2005, which not only provides information on people's diabetes status and socioeconomic background, but also on parental diabetes, enabling us to construct an instrumental variable similar to what has been used in the previous literature on high-income countries.² The data also allows the extension of the analysis to test if the inclusion of information on parental education as an additional control variable affects the IV parameter estimates.

The remainder of the paper is structured as follows. Section 2 provides details about the used dataset and the

¹ In 2005 around 58 percent of the working population in Mexico were employed in the informal sector (Aguila et al., 2011).

² Studies that have used the family history of diabetes as an instrument for diabetes are Brown et al. (2005) for a Mexican-American community, Latif (2009) for Canada, Minor (2011) for females in the US and Lin (2011) for Taiwan.

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