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An investigation into the effect of alcohol consumption on health status and health care utilization in Ireland

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ABSTRACT

This paper presents a study of the effect of alcohol consumption on individual health status and health care utilization in Ireland using the 2007 Slán National Health and Lifestyle Survey, while accounting for the endogenous relationship between alcohol and health. Drinkers are categorized as those who never drank, non-drinkers, moderate drinkers, or heavy drinkers, based on national recommended weekly drinking levels in Ireland. The drinking-status equation is estimated using an ordered probit model. Predicted values for the inverse mills ratio are generated, which are then included in the health and health-care utilization equations. Differences in health status for each category of drinker are examined, and the relationship between both alcohol consumption and health with a host of other personal and socio-economic variables is also identified. Given that the measure of health status available is self-assessed, the effect of alcohol consumption on health-care utilization is also analyzed as an alternative measure of health. Findings show that in Ireland, moderate drinkers enjoy the best health status. More moderate drinkers report having very good or excellent health compared with heavy drinkers, non-drinkers, or those who never drank. While heavy drinkers do not report having as good a health status as moderate drinkers, they are better off in terms of health when compared with non-drinkers and those who are lifetime abstainers.

1. Introduction

The World Health Organization (2014) states that the harmful use of alcohol causes a large disease, social, and economic burden in societies. They state that in 2012, about 3.3 million deaths, or 5.9% of all global deaths, were attributable to alcohol consumption, and 5.1% of the global burden of disease and injury were attributable to alcohol consumption. The WHO (2014) also reports that there is a wide geographical variation in the proportion of alcohol-attributable deaths and Disability Adjusted Life Years (DALYs), with the highest alcohol-attributable fractions reported in the WHO European Region. A report commissioned by the Department of Health in Department of Health Ireland (2014) states that a total of €793 million was spent on health and social care expenditure related to alcohol misuse in Ireland in 2013.

This paper investigates the effect of alcohol consumption on health status in Ireland while accounting for the potential endogenous relationship between alcohol and health. Drinkers are categorized into four categories based on the recommended weekly drinking levels of the Irish Health Promotion Unit Health Service Executive (2008) in Ireland at the time of the survey: those who never drank, current non-drinkers, moderate drinkers, and heavy drinkers. Differences in health status for each of the categories are examined, and the relationship between both alcohol status and health with a host of other personal and socio-economic variables such as age, gender, marital status, employment status, and level of education, among others, is also identified. The burden of alcohol consumption on medical care is also assessed.

Sample selection bias arises when a sector selection is non-random due to individuals choosing a particular sector because of their personal characteristics (Heckman, 1979; Zhang, 2004). In relation to categorizing individuals based on their levels of alcohol consumption, selection bias may arise as people may select into a particular drinker group because they know that by doing so it will not have a negative effect on them (Barrett, 2002; Di Pietro & Pedace, 2008; Hamilton & Hamilton, 1997).

Endogeneity is the situation in which an independent variable included in the model is potentially a choice variable and is determined within the context of the model (Chenhall & Moers, 2007). In relation to the study of a lifestyle variable such as

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alcohol on health, alcohol consumption is governed in part by unobserved factors, which may also be important determinants of the dependent variable 'health', implying the possibility that alcohol consumption may be correlated with the error term of the conditional-demand equation (Kenkel, 1995). If endogeneity occurs and is not accounted for, it would mean that alcohol is determined within the model used to estimate health status, resulting in the estimates received being inaccurate.

The remainder of this paper is presented as follows. Section 2 presents the theory in relation to the issue of the factors affecting health status and health-care utilization and the impact alcohol has on both. Section 3 outlines the empirical model used to analyze the effect of drinking status on health while controlling for selection bias and endogeneity. Section 4 identifies and describes the data and empirical results. Section 5 concludes the paper.

2. Health production framework

2.1. Grossman's human capital model

Michael Grossman's human capital model of the demand for health states that individuals derive utility from the services that health capital yields and from the consumption of other commodities (Gerdtham, Johannesson, Lundberg, & Isacson, 1999; Wagstaff, 1986). The determinants of health constitute an issue of vital importance to health policy. The stock of health capital depreciates over time, and the consumer can produce gross investments in it according to a household production function using medical care and their own time as inputs. Grossman (1972) argues that if one can improve one's health status, they are then in a position to work more, are absent from work less, and are more productive, which results in higher income. Grossman adds to this theory by saying that an increased wage rate results in one's returns from healthy days increasing, and hence workers will therefore tend to increase their optimal capital stock of health. Consumers are viewed as producing gross investments in health using inputs of medical care and their own time.

2.2. Self-rated health

The World Health Organization defines health as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. Health is a resource for everyday life, not the objective of living.

Self-Assessed Health is probably the most common measure of health in general-purpose surveys and is often the only available indicator of the respondent's health (Jürges, 2008). The Self-Assessed Health measure is widely used both as an outcome variable in studies of social influences on health (Contoyannis & Jones, 2004; Jürges, 2008; Kiuila & Mieszkowski, 2007) and as an explanatory variable in other studies (Disney, Emmerson, & Wakefield, 2006; Wang, 1997). Fayers and Sprangers (2002) state that in relation to the question *'What do you think about your health in general? Very good, Good, Fair, Poor, Very Poor?'* there is widespread agreement that this simple global question provides a useful summary of how patients perceive their overall health status.

Health status is highly correlated with health-care utilization. The most immediate determinant of utilization is health status (Gruber & Kiesel, 2010).

2.3. Health-care utilization

Numerous studies find that the health status variables are strongly associated with both visits to general practitioners (GPs) and specialists. Individuals who report a poorer health status are more likely to report greater use of physician services (Dunlop, Coyte, & McIsaac, 2000; Laroche, 2000). Madden, Nolan, and Nolan (2005) assessed the impact of health status on health services in Ireland by looking at a range of different illnesses and find a positive relationship between each illness and the utilization of GP services, highlighting that people in poor health use GP services more. Rotermann (2006) finds that in Canada, seniors who perceive their health as fair or poor are heavy users of health-care services. Similarly, Finkelstein (2001) finds that the mean expenditure on physicians is substantially higher among those who reported poorer health status and that self-reported health status is significantly related to the probability of seeing a specialist.

The World Health Organization (2011) states that health is a positive concept emphasizing social and personal resources, as well as physical capacities. Rivera (2001) states that health is affected by many factors, which can be divided into four groups of variables: biological, socio-economic, lifestyle, and medical resources.

2.4. Alcohol and health status

The effects of alcohol on one's health status have been the subject of much research. In general, findings tend to be that moderate levels of alcohol consumption are beneficial toward one's health status, compared with abstaining from or consuming heavy amounts of alcohol, which has a negative effect on health status (Bau, Bau, Rosito, Manfroi, & Fuchs, 2007; Berger et al., 1999; Klatsky, Armstrong, Friedman, & Sidney, 2001). This gives rise to a U-shaped curve or a partial U-shaped curve referred to as a J-shaped curve, showing a reduced relative risk of given diseases, and, in general, better health for moderate consumers of alcohol compared with abstainers or heavy drinkers (Bau et al., 2007; Berger et al., 1999; Klatsky et al., 2001). Studies looking at the relationship between alcohol consumption and specific illnesses have similar findings, in that moderate consumers of alcohol are at lower risk. Wannamethee and Shaper (1999); Rimm and Moats (2007), Bryson et al. (2006), and Klatsky et al. (2005) find this in relation to coronary heart disease. Becker et al. (1996) finds this in relation to liver disease, and Berger et al. (1999), Mukamal (2007), and Klatsky et al. (2001) find this in relation to the risk of stroke. Green and Polen (2001) found that light to moderate drinkers of alcohol appear to be in better health, both mentally and physically, have better functional status, and are also more likely to engage in preventative health care services, compared with abstainers or heavy drinkers.

Similarly, in relation to alcohol consumption and the utilization of health services, findings are that male non-drinkers are more likely to use GP services. Female non-drinkers are more likely to have visited a GP when compared with moderate drinkers, but a female who has 12 drinks or more per week is more likely to have visited a GP six times or more in the previous year when compared with either non-drinkers or moderate drinkers.

Many studies have been carried out regarding the effect of alcohol consumption on income, and findings show that moderate consumers of alcohol have higher incomes (Barrett, 2002; Hamilton & Hamilton, 1997; Ormond & Murphy, 2016). All these studies argue that a possible explanation for this is based on the fact that medical literature states that there are health benefits to moderate levels of alcohol consumption, and referring to the Grossman (1972) theory, this would result in efficiency levels improving, hence incomes increasing.

3. Empirical model

The relationship between alcohol consumption and health status is examined. Alcohol consumption is estimated as an ordered probit