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# Price elasticity of demand for voluntary health insurance plans in Colombia

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## Abstract

**Background:** Since 1993, Colombia has had a mandatory social health insurance scheme that aims to provide universal health coverage to all citizens. However, some contributory regime participants purchase voluntary private health insurance (VPHI) to access better quality health services (i. e., physicians and hospitals), shorter waiting times, and a more extensive providers' network. This article aims to estimate the price elasticity of demand for the VPHI market in Colombia.

**Methods:** We use data from the 2016–2017 consumer expenditure national survey and apply a Heckman selection model to address the selection problem into purchasing private insurance. Using the estimation results to further estimate the price semi-elasticity for VPHI, we then calculate the price elasticity for the households' health expenditure and acquisition of VPHI.

**Results:** Our main findings indicate that a 1% VPHI price increase reduces the proportion of households affiliated to a VPHI in the country by about 2.32% to 4.66%, with robust results across sample restrictions. There are relevant differences across age groups, with younger households' heads being less responsive to VPHI price changes.

**Conclusions:** We conclude that the VPHI demand in Colombia is noticeably elastic, and therefore tax policy changes can have a significant impact on public health insurance expenditures. The government should estimate the optimal VPHI purchase in order to reduce any welfare loss that the current arrangement might be generating.

**Keywords:** Private health insurance, Voluntary private health insurance, Demand for health insurance, Price elasticity

## Background

The literature in developed economies shows that private health insurance (PHI) is price inelastic [1, 2], with higher elasticity by age and income [3]. Moreover, it changes with the health system organisation, particularly in countries with universal health insurance, in which a PHI is complementary and voluntary to the health scheme plan. In these cases, elasticity tends to be higher but still inelastic or close to one. However, literature for developing countries is scarce, with no studies conducted

in Latin American countries. Knowing the price elasticity of demand for PHI is crucial for better understanding the impact that fiscal measures may have on the demand for these services (i.e., changes in VAT or tax deductions consumers of PHI receive) [4]. Likewise, it is relevant information for companies that offer PHI to know how sensitive users are to price increases when planning premium adjustments each year.

Since 1993, Colombia has mandatory social health insurance scheme that aims to provide universal health coverage to all citizens. All affiliates of the Colombian Social Security Health System (known in Spanish as Sistema General de Seguridad Social en Salud – SGSSS) are entitled to a comprehensive health benefits package that covers nearly 98% of the Colombian population [5]. The health insurance scheme is financed through public

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resources and payroll contributions, which are mandatory for those able to pay. Formal workers and people with the capacity to pay are covered by the contributory regime, while those with low income and informal jobs can apply to a fully subsidised scheme [6]. In this system, health insurers, which receive a capitation-based premium per person, act as gatekeepers and limit healthcare access to contain health expenditures. In addition to the SGSSS, there is a voluntary private health insurance (VPHI) market for people who want to avoid the gatekeeping system, looking for faster access to health care, a more extensive pool choice of providers, and better amenities in health care facilities. In the country these products are also known as prepaid medicine, supplemental plans, or private health insurance plans. According to the article published by the Federation of Colombian Insurers – Fasescol, in their magazine in 2015, about 4.4% of Colombian households have any type of VPHI given the data of the 2012 Longitudinal Social Protection Survey [7]. A more recent study conducted by PROESA about the VPHI in the Colombian healthcare system suggests that the VPHI market currently covers around 2.8 million people, which accounts for approximately 6% of the population [8]. VPHI are financed with private resources and usually offer supplementary coverage to the mandatory health plan (some offer complementary options as well). VPHI plans are in most cases paid by the household directly, and in some cases, employers might incentivise the acquisition of these plans. Public policy-makers have created a series of tax incentives for individuals who buy VPHI, hoping to relieve the burden on the public system [9, 10]. In Colombia, VPHI plans pay a reduced VAT rate (5% in contrast to the standard VAT rate of 19%), and VPHI payments are deductible up to a maximum of COP 581,000 monthly (USD \$197 with the mean exchange rate of the survey year of 2.951 COP/USD). All VPHI plans are regulated by the Colombian law (Ley 1438 of 2011, Title IV) and companies that sell these plans are overseen by the National Superintendent of Health and the Financial Superintendence of Colombia [11]. Each VPHI plan and associated premiums are set in accordance with the technical guidelines defined by the National Superintendent of Health (Circular Externa No. 20 de 2015). Premiums are set based on individual's age and gender, and they are not allowed to vary with health status. (see Additional file 2 for details about the VPHI market in Colombia).

This article aims to estimate the price semi-elasticity of demand for VPHI in Colombia, using the National Household Budget Survey (ENPH 2016–2017) [12]. The estimates are based on a model in which households choose whether to buy a VPHI or not. Household income, members' age, the number of children

under 18 years in the household, as well as the quality of health services that people can have access through the public health system are some of the main determinants of demand for VPHI and also of the premium paid by a given member of the household. The VPHI price or premium to be paid is an endogenous variable, making this the main methodological challenge when estimating price elasticity of demand for VPHI. To address this self-selection into the VPHI system, we use a Heckman selection model. We instrument the regression of the logarithm of the risk premium (first stage) with the household size (number of household members), which we believe has an impact on the total value to be paid for the premium, but not the probability of purchasing insurance through another channel than the price. Our estimates suggest that the price elasticity at the household level ranges between -4.67 and -2.32, which has proven to be elastic and robust across the sample restrictions.

The rest of the paper is organised as follows. Following a brief literature review, "Methods" section describes the empirical strategy used to estimate the price elasticity of demand and the data. "Results" section presents the results and some robustness checks and heterogeneity exercise. "Discussion" section presents the discussion of the results and possible limitations of the estimation, and "Conclusions" section concludes.

#### Literature review

The price elasticity of demand for VPHI refers to the degree of response of the quantity demanded of VPHI to changes in the premium or rate. More formally, the elasticity indicates the percentage change in the quantity demanded concerning a unit percentage change in the premium or the tariff, considering that the rest of the determinants of demand for VPHI, such as people's income, remain constant [13]. There are two types of price elasticity of demand in this case: (i) elasticity of the decision to get insurance or not, also known as take-up elasticity, and (ii) elasticity of quantity or quantity level of coverage demanded, also called elasticity of demand. The vast majority of studies estimate the latter.

According to most of the estimates that the academic literature has documented, the demand for VPHI is price inelastic [1, 2]. Most studies are concentrated in the United States, where the estimated price elasticity ranges from -0.2 to -0.7, although a few studies find elasticities of -1 or even -2 [14]. Studies in other industrialised countries also suggest that this private health insurance demand is inelastic [15]. However, most of the literature highlights the possible heterogeneity results concerning the age of the individuals who decide whether to take insurance.