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Does voluntary health insurance reduce the use of and the willingness to finance public health care in Sweden?

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Abstract

Voluntary private health insurance (VHI) has generally been of limited importance in national health service-type health care systems, especially in the Nordic countries. During the last decades however, an increase in VHI uptake has taken place in the region. Critics of this development argue that voluntary health insurance can undermine support for public health care, while proponents contend that increased private funding for health services could relieve strained public health care systems. Using data from Sweden, this study investigates empirically how voluntary health insurance affects the public health care system. The results of the study indicate that the public Swedish health care system is fairly resilient to the impact of voluntary health insurance with regards to support for the tax-based funding. No difference between insurance holders and non-holders was found in willingness to finance public health care through taxes. A slight unburdening effect on public health care use was observed as VHI holders appeared to use public health care to a lesser extent than those without an insurance. However, a majority of the insurance holders continued to use the public health care system, indicating only a modest substitution effect.

Key words: Health care consumption; health care usage; private health care; private health insurance; willingness to pay tax

1. Introduction

Voluntary private health insurance (VHI) has usually been of limited importance in national health service-type systems (Saltman *et al.*, 2004); e.g. health care systems characterised by universal access to a comprehensive set of services financed by income tax and with low patient fees (Freeman, 2000). This is true particularly in the Nordic countries, which have been distinguished by a strong emphasis on social equality in health policy and predominantly public systems for care provision (Magnussen *et al.*, 2009). During the last decades however, a notable increase in the number of VHI holders has taken place in many national health service-type systems, including the Nordic countries (Alexandersen *et al.*, 2016; Tynkkynen *et al.*, 2018; Martinussen and Magnussen, 2019). This development has given rise to debates in both academic circles and the political realm. Critics have highlighted the risk that the increased use of VHI may reduce the willingness to pay taxes to finance public health care systems (Propper and Green, 2001; Lapidus, 2017). This risk appears particularly high if the VHI is supplementary, providing access to the same types of services as those offered within public health care systems, as this implies that VHI holders ‘pay twice’ for these services (Mou, 2013). Proponents of VHI, meanwhile, suggest that this brings an increase in the total amount of resources devoted to health care in a country, and therefore helps unburden strained public health care systems. This may occur for instance through shortened waiting times in the public systems, which would improve access to care

also for those without VHI (Besley and Coate, 1991; Morin, 2016). In the case of the Nordic countries, some have argued that their relatively generous public health care systems reduce the need for VHI, making it less likely that such markets would have a strong effect on the public systems. On the other hand, it has also been argued that the fact that equity has been such a central policy goal in Nordic health care may make the recent growth in VHI in this region even more controversial and contested than in other countries (Alexandersen *et al.*, 2016; Lapidus, 2017). So far, however, the empirical evidence regarding the impact of VHI in national health service-type systems remains largely inconclusive, both in the Nordic context and among national health service-type systems in general. It is still an open question whether the increased uptake of VHI will reduce the willingness to pay income tax in support of public health care systems. Nor is there any clear evidence as of yet that VHI unburdens public health care systems and if so, in what way. The recent proliferation of VHI has pushed these questions to the forefront of the health policy debate in the Nordic countries as well as in other national health service-type systems, and the answers have direct implications for how policy makers choose to address them.

This paper investigates how VHI has affected the public health care system in the case of Sweden, the largest of the Nordic health care systems. Together with Norway, Sweden represents something of an extreme case as both voluntary health insurance and private health care providers were very rare in the country prior to 1990. The modern Swedish health care system was created in the post-war era, and was guided by values such as universality and social solidarity. These principles were interpreted to mean that all care services should be provided through the public system, and that medical need, rather than employment or ability to pay, should be the only legitimate ground for access to care. These principles have been challenged in recent decades, as VHI uptake has increased, and a parallel sector of private health care providers has begun to emerge alongside the public system (Kullberg *et al.* 2019; Tynkkynen *et al.*, 2018). In this sense, Sweden can be seen as an interesting case for studying the effects of a growing VHI sector. Two main research questions are addressed in the paper: The first is whether VHI holders are less interested in funding the public health care system through income taxation, and the second is whether having a VHI is associated with lower utilization of the public health care system compared to those without private health insurance. The data used in the study come from a national survey on attitudes towards public institutions, including the health care system, comprising 1335 respondents.

1.1 Prior research on VHI and public health care systems

The association between private and public health care financing is complex and constitutes a vast field of research. Health care can be financed privately in a number of ways, the most common of which are the so-called out-of-pocket payments, and the purchase of private health insurance. In countries with universal or near-universal public coverage, taking on a private health insurance is almost always a voluntary practice, reflected in the term ‘voluntary private health insurance’ (Mossialos and Thomson, 2002, 2004; Sagan and Thomson, 2016). It is paid for either by individuals or by employers on behalf of individuals. In contrast to social health insurances, VHIs have premiums based on health-related risks rather than income (OECD, 2004; Wasem *et al.*, 2004). While most studies so far have been conducted in countries with social insurance-based health care systems, there is also a growing interest in the effects of VHI on health care systems that are tax-funded – the so-called national health service-type systems (Alexandersen *et al.*, 2016; Tynkkynen *et al.*, 2018; Martinussen and Magnussen, 2019).

There are three main types of VHI: supplementary, complementary and substitutive. In the national health service-type systems which are the focus in this study, the most common form of VHI is supplementary, followed by complementary VHI (Sagan and Thomson, 2016). Supplementary VHI provides coverage for services already included in the public health care

system. This implies that the VHI insurance in such cases duplicates access to some health care services for the insurance holders, since it is generally not possible to opt-out from national health service-type systems. Previous studies indicate that a common reason for obtaining supplementary VHI in national health service-type systems is to get access to faster or higher quality care than is offered through the public system (Besley *et al.*, 1999; Aarbu, 2010; Sagan and Thomson, 2016; Tynkkynen *et al.*, 2018). In cases where complementary VHI is common, such as Denmark and Finland, this form of insurance typically offers reimbursement for patient fees, or access to services that are not included in the public system, such as eye glasses or dental care (Sagan and Thomson, 2016). Although VHI exists in most national health service-type countries, the share of the population covered differs greatly, from over half of the population covered in Australia to only about 1% in Lithuania (OECD, 2019).

The relationship between the growing demand for VHI and attitudes towards the public health care system in countries with national health service-type systems has been investigated in several studies. There is relatively strong empirical support for the proposition that a perceived lack of quality in the public health care system tends to lead to increased demand for VHI, for instance in Spain, Italy and the UK (Jofre-Bonet, 2000; Costa and García, 2003; Costa-Font, 2004; Taylor and Ward, 2006; Baldini and Turati, 2012). In particular, long waiting times in public health care systems have been reported to be associated with increased VHI uptake in the UK and Norway (Besley *et al.*, 1999; King and Mossialos, 2005; Aarbu, 2010; Bíró and Hellowell, 2016). This points to discontent with public systems affecting the tendency to purchase VHI. Another study showed that VHI uptake seemed to affect the levels of spending in the public health care system. In the UK, it was found that health districts with many VHI holders tended to invest less into reducing waiting times in the public system (Besley *et al.*, 1998).

Other studies have shown that VHI-insurance holders are less supportive of public health care systems. In Spain, for instance, support for the public health care system, as measured by responses to the question of whether the system ‘needs to change’, was found to be lower among VHI holders than non-holders (Costa-Font and Jofre-bonet, 2008). Similar results were found in the UK, where individual VHI uptake was reported to be associated with lower support for spending on the public health care system (Hall and Preston, 1998). On the other hand, when Martinussen and Magnussen (2019) asked Norwegian respondents whether ‘the responsibility for health care should be mainly public’, they found no differences between VHI holders and non-holders (Martinussen and Magnussen, 2019). These differing results could be attributed to differences in survey design, for instance with regards to how questions are formulated or which control variables were used. They could also reflect real differences between populations regarding support for public health care and the motivations behind obtaining VHI. Furthermore, as noted by Wendt with colleagues, even if there appears to be a relationship between discontent with the public system and VHI uptake, this does not necessarily mean that individuals will stop supporting the *idea* of a universal, tax-financed health care system or be less willing to pay tax to help finance it (Wendt *et al.*, 2010).

Another possible effect on public health care systems of increased VHI uptake is that a growing market-based health care might draw medical personnel from the public system to the private sector. With a growing market for VHI, skilled staff might be drawn to private clinics, financed by VHI, either full or part-time. This can lead to staff shortages and quality reductions in the public system, which re-enforces public perceptions that care services are of higher quality in the privately funded sector. Propper described this effect as a ‘vicious circle’ where, in the end, public health care becomes a ‘poor service for the poor’, while those who can afford it or have the right employment use VHI to gain access to high-quality health services (Propper, 2000; Propper and Green, 2001). Such a development would clearly undermine the values of solidaristic financing and equal access which underpin national health service-type systems (Foubister *et al.*, 2006; Cheng *et al.*, 2018).

Previous research on employment patterns of medical staff has found that they tend to reallocate working hours from the public to the private sector if this offers greater remuneration (Brekke and Sørsgard, 2007; Moghri *et al.*, 2017; Cheng *et al.*, 2018). The so-called dual practice, where health care professionals work in both the privately funded and publicly funded sectors, has also been found in several countries with national health service-type systems (Brekke and Sørsgard, 2007). It has been claimed that dual practice creates incentives for physicians to reduce working hours in the public health care sector in order to refer patients to privately funded clinics. It has also been suggested that physicians would use public resources, such as facilities and equipment, in pursuit of gains in the private sector. As a result, many countries have regulated opportunities for dual practice on the part of medical personnel (García-Prado and González, 2007, 2011). For instance, in Norway, an incentive to increase the salary of physicians working in public hospitals was introduced in 1996 in order to compete for the workforce. This might explain why physicians engaging in dual practices have declined by 30% during the first decade of the millennium in Norway. In addition, it was also found that total working hours in public hospitals were, on average, similar for both those who did and did not engage in dual practice (Johannessen and Hagen, 2014).

The potential effects of a growing VHI market on public health care systems have also been viewed as positive. In several countries, governments have supported VHI uptake as a means to reduce pressure on public health care systems (Mou, 2013; Eldridge *et al.*, 2016; Sagan and Thomson, 2016; Doiron and Kettlewell, 2018). Besley and Coate argue that a supplementary VHI can redistribute from the rich to the poor if individuals with means turn to a privately financed health care sector, thus lessening the burden on the public health care system and leaving more resources to those remaining in it (Besley and Coate, 1991). This effect, referred to as the substitution argument, is based on several conditions, such as the services offered within the two sectors being equivalent, and that the VHI is supplementary in nature so that patients can substitute publicly financed health care services with privately financed ones (Mou, 2013). Another precondition is that those who substitute public health services with privately financed health care do not opt-out financially from the public system, i.e. that they continue to pay taxes to finance it (Besley and Coate, 1991; Propper and Green, 2001; Thomson and Mossialos, 2006). There are some empirical findings supporting the substitution argument. Bíró and Hellowell (2016) found that an increase in VHI was associated with a reduction in waiting times in the National Health Service (NHS) in the UK (Bíró and Hellowell, 2016). Similarly, studies from Australia indicate that VHI reduced the use of public hospitals as insurance holders instead used private hospitals (Eldridge *et al.*, 2016; Doiron and Kettlewell, 2018). Evidence of substitution of public with privately financed health care through VHI has also been found in Italy (Fabbri and Monfardini, 2016) and Spain (Costa-Font, 2004; Cantarero-Prieto *et al.*, 2017). Finally, in one of the few studies of VHI in the Nordic setting, a 10% reduction of public hospital use among employer-funded insurance holders was identified in Denmark when comparing insurance holders with non-holders (Søgaard *et al.*, 2013).

Taken together, the previous research on the relationship between public health care systems and VHI markets appears inconclusive. Some studies indicate that VHI affects public health care support and willingness to pay health care tax, but others point to no such effect. Regarding the argument that VHI unburdens the public health care sector, some empirical studies point towards this direction, but the conditions under which such a substitution can occur, and what the long-term consequences are, for instance regarding social equity, remain unclear. It can also be noted that most studies on the effects of growth in VHI in national health service-type health care systems appear to have been carried out in the UK or Mediterranean countries, while effects on the Nordic systems are less explored.

In the following empirical part of the paper, effects on the recent growth in VHI in the case of Sweden are examined. The main arguments for both critics and proponents of VHI will be investigated. First, it is examined whether holders of VHI in Sweden report less willingness to pay taxes

to finance the public health care system. Second, the study examines whether holding a VHI is associated with less use of publicly financed health services. This is, to our knowledge, the first systematic inquiry of such effects in the Swedish setting.

1.2 Case study context: health care in Sweden

Sweden has a tax-funded, universal health care system of the national health service-type, where equity and solidarity are fundamental principles. According to the Health and Medical Service Act (*SFS 2017:30*), health care should be distributed on equal terms for all citizens and only on the basis of medical need. This means that employment, insurance or ability to pay should not influence who gets medical treatment or is prioritized within the system. The responsibility for funding and providing health care is decentralised in Sweden to 21 autonomous local authorities, known as regions. Each region levies income taxes directly from their population, which form the bulk of health care spending (Glenngård, 2016). In this way, Sweden has in essence an earmarked 'health care tax', which distinguishes the system from other national health service-type systems including the other Nordic countries. The regions are responsible for providing both primary care and specialist care. Highly specialised care is provided by the university hospitals, which accept patients from all regions. The Swedish public health care system is comprehensive, including a broad scope of services and generally maintains a high level of medical quality. However, as in many other systems of the type, there have often been relatively long waiting times for certain treatments; a problem that has received much public attention (Blomqvist 2020). As a result of the expansion of public health care services in the post-war period, the role of private health care providers and financiers was severely diminished within the system, particularly after 1970 (Blomqvist, 2020; Carder and Klingeberg, 1980) However, following market-orienting reforms beginning in the 1990s, the number of private care providers has increased again, particularly in primary and outpatient specialist care (Andersson *et al.*, 2014; Isaksson *et al.*, 2016). The lion's share of the funding of private care providers is tax-based, as most private care providers have contracts with the regions and work foremost within the public system. Hence, privately operated clinics can receive both publicly funded patients and patients funded by a VHI. Most private care providers in Sweden are found in the primary care sector. In 2018, 37% of the publicly funded primary care was provided by private actors. The corresponding share of somatic specialised care was only 7% (Kolada, 2020). Notably, there are no private care units at public hospitals in Sweden reserved for private patients, as this is not allowed. Therefore, all privately funded health care is carried out at private health clinics.

VHI was very uncommon in Sweden prior to the 1990s. As late as 2001, only about 100,000 individuals had a VHI. By the end of 2019, the number of insurance holders had increased to 658,000 individuals, equivalent to about 13% of the working population (Insurance Sweden, 2019). The insurance plans available in the Swedish market offer primarily supplementary VHI covering specialist treatments such as elective surgery and rehabilitation services. Most private health insurances also cover sessions with a psychologist and chiropractor. Co-payments in public health care and for pharmaceuticals are also included in some plans. All insurance plans give the insured access to a care-coordinator, often a registered nurse, who makes the first assessment by phone before making an appointment with a health professional. VHI plans typically guarantee specialist appointments within six days and surgery within 21 days, as compared with the waiting time guarantees of 90 days to visit a specialist and an additional 90 days to surgery within the public health care system (Kullberg *et al.* 2019). This means that VHI holders in practice receive care more promptly than public patients. Information about the scope of privately funded health care production in Sweden is difficult to access, but it is clear that its share is still very small. In 2018, it was estimated that VHI-funded surgery constituted around 1% of all surgeries in Sweden. Health care financed by VHI is most common within orthopaedics, medical dermatology and otorhinolaryngology (SAHCSA, 2020). A majority of the Swedish insurance

holders receive their insurance as a fringe benefit from their employers (Alexandersen *et al.*, 2016). Prior to 2018, individuals receiving VHI through their employment were not taxed for this benefit, but this changed to 1st of July 2018 when a tax was imposed. The cost of VHI remained deductible for employers. In August 2020, the centre-left government declared that the ‘negative effects’ of the growing VHI market in Sweden, which made it possible for some groups to bypass waiting lines and thereby violating the needs-principle, would be investigated by a public commission (Swedish Ministry of Social Affairs, (2020).

2. Methods

In order to investigate the implications for the public health care system in Sweden of the recent growth of VHI, a cross-sectional survey study was conducted. Two research questions were addressed, the first regarding whether individuals holding a VHI showed less willingness to pay taxes to the public health care system, and the second regarding whether they tended to use this system less than those without a VHI.

2.1 Material

The data used in the study were taken from the 2016 wave of the Swedish National SOM-survey, a survey conducted yearly by the SOM institute and Gothenburg University. For this study, part IV was used, which is one of the six parallel blocks in the annual SOM-survey sent to 3400 individuals. The SOM-survey contains data from a representative sample of the Swedish population between 16 and 84 years and contains questions about media habits, political orientation and trust in different public institutions as well as demographic and socioeconomic background information (SOM-institute, 2016, 2020). The year 2016 was the first year in which questions about VHI were included in the questionnaire. Data were collected between September 2016 and January 2017. The respondents were given the opportunity to answer the survey by filling out a paper questionnaire, or by using a web-based questionnaire. Reminders were sent out by mail, phone and SMS. The response rate was 51%, for a total of 1636 respondents. The SOM-survey was approved by the Swedish Regional Ethical Review Board of Gothenburg in 2015 (Dnr: 130-15).

2.2 Measures

The outcome variable for the first research question, regarding willingness to pay for public health care among VHI holders, was operationalized as willingness to pay additional health care taxes. The question asked was: ‘*What is your opinion regarding the following proposition: Taxes should be increased to improve the quality of publicly funded health care.*’ The response alternatives were: ‘very good suggestion’; ‘good suggestion’; ‘neither good nor bad suggestion’; ‘bad suggestion’; ‘very bad suggestion’.

The outcome variable for the second research question regarding the use of public health care services among VHI holders was operationalized in terms of public health care utilization. This variable was based on the survey question: ‘*How many times in the past 12 months have you sought medical care for yourself in the public health care system?*’ The response alternatives were: ‘no times’; ‘one to three times’; and ‘four times or more’. For the main analysis, a dichotomized variable was constructed, with the outcomes: ‘no public use’ and ‘public health care use’, where the outcomes ‘one to three times’ and ‘four times or more’ were combined into ‘public health care use’. In an additional analysis, the full variable with all three outcomes (labelled ‘non-users’, ‘moderate users’ and ‘frequent users’, respectively) was used.

To further investigate insurance holders’ use of public and private health care services, two additional outcome variables were constructed based on the survey questions: ‘*How many*

times in the past 12 months have you sought medical care for yourself in the public health care system? and *'How many times in the past 12 months have you sought medical care for yourself in the private health care system, through your VHI?'* The first variable; 'private and public use' had four potential outcomes: 'no health care use' (neither public nor private); 'only public use'; 'only private no public use'; and 'both public and private use'. The second variable; 'total health care use' was dichotomized by combining the last three outcome categories in the variable mentioned above, generating two outcome spaces: 'no health care use' and 'public and/or private health care use'.

Having a VHI was used as the main explanatory variable in regard to both questions. This was measured through the question *'Do you have a voluntary¹ health insurance that gives you access to private health care?'* with response alternatives 'yes'; 'no'; and 'do not know'. The third option was omitted in the analysis, as it was seen as impossible to estimate whether such respondents did in fact hold a VHI or not. This meant that the VHI variable was made dichotomous.

A number of control variables which were suspected to be potential confounders were also included in the analysis, all obtained from the Riks-SOM survey. In relation to the question about the willingness of VHI holders to pay health care taxes: sex, age, self-assessed health, household income, education and political orientation were included. In line with previous research, individuals who identified themselves as politically oriented to the right were expected to be more likely both to hold a VHI and be less supportive of paying income tax towards the public health care system. For the second research question, regarding the use of public health services, the control variables sex, age, self-assessed health, education and household income were included as control variables. All variables are presented in [Table 1](#).

2.3 Statistical analysis

To examine the first research question regarding willingness to pay for public health services, a cross-tabulation with VHI and willingness to pay tax was calculated. Next, four nested linear regression models (OLS) were constructed. Willingness to pay health care tax was the outcome variable and VHI was the explanatory variable. First, a bivariate model was calculated. In the second step, the control variables sex, age and self-assessed health were included. Household income and education were included in the third model, and in the fourth model, all controls including political orientation were entered. To establish the statistical significance of the difference between VHI holders and non-holders for each outcome category of willingness to pay health care tax, multinomial logistic regression analyses with focus on change in predicted probabilities (using the function [mchange] in STATA) were conducted for all four models.

To investigate the second question, regarding the use of public health services among VHI holders, public as well as private health care usage was investigated. First, to estimate the overall effect of VHI on public health care use, a logistic regression was conducted. Percentage change in odds and marginal change in predicted probabilities were estimated to compare insurance holders' and non-holders' health care use. Sex, age, self-rated health, household income and education were included as control variables in the model. Second, a cross-table of VHI and private and public health care use was calculated. Third, a logistic regression with the dichotomized variable 'total health care use' was carried out, including the same control variables as mentioned above. Fourth, to further explore insurance holders' public health care use, the outcome variable, public health care use, with three outcome spaces: 'non-users'; 'moderate users'; and 'frequent users, was used in a cross-table with VHI. In addition, to investigate the differences between VHI holders' and non-holders' public health care use, a multinomial logistic regression with changes in predicted probabilities (using the function mchange) was estimated. Sex, age, self-rated health, household income and education were included as control variables.

¹The actual wordings, translated verbatim from Swedish were: 'Do you have a private health insurance, giving you access to private health care?'

Table 1. Summary statistics, variables included in the analyses

Variables	A1				A2			
	Obs.	Mean (SD)	Min	Max	Obs.	Mean (SD)	Min	Max
<i>N</i> (total)	1.280				1.335			
Willingness pay tax								
Very good [1]	155							
Good [2]	327							
Neither nor [3]	367							
Bad [4]	268							
Very bad [5]	163							
Public health care use (dichotomised)								
No public use [0]					375			
Public health care use [1]					960			
Public health care use								
Non-users [1]					375			
Moderate users [2]					717			
Frequent users [3]					243			
Private and public use								
No health care use [1]					352			
Only public use [2]					909			
Only private no public use [3]					23			
Both public and private use [4]					51			
Total health care use (dichotomised)								
No health care use [0]					352			
Public and/or private use [1]					983			
VHI								
Yes [1]	196				203			
No [0]	1084				1.132			
Sex								
Female	655				691			
Male	625				644			
Age	1.280	54 (16)	16	85	1.335	54 (17)	16	85
Self-assessed health	1.280	7.5 (2)	0	10	1.335	7.5 (2)	0	10
Household income	1.280	6 (3)	1	12	1.335	5.9	1	12
Education								
<Elementary school [1]	155				173			
<High school [2]	343				366			

(Continued)

Table 1. (Continued.)

	A1	A2
<University studies ^a [3]	325	337
<University degree [4]	457	459
Political orientation		
Clearly left [1]	139	
Slightly left [2]	282	
Neither nor [3]	370	
Slightly right [4]	343	
Clearly right [5]	146	

A1 – represents the first question with outcome; willingness to pay health care tax.

A2 – represents the second question with outcomes: public health care use; private and public health care use; total health care use.

^aCollege/university studies, no degree.

Since some of the variables, such as holding VHI and self-rated health, had a relatively high rate of missing values, multiple imputation by chained equations (MICE) were performed. As no substantial differences between the output from the imputed models and the basic models were found, the basic models were reported. All analyses were conducted in STATA SE 14.2.

3. Results

3.1 Are VHI holders less supportive of funding public health care?

The relationship between having a VHI and willingness to pay increased health care tax was first examined in a cross-tabulation. The result suggested that VHI holders, to a greater extent than non-holders, thought that an increased health care tax was a bad or very bad idea (see Table 2).

In the bivariate OLS model, an association between VHI and willingness to pay tax was found (Model 1, Table 3). The association was weakened when controlling for sex, age and self-assessed health (Model 2, Table 3), and disappeared when household income and education were added (Model 3, Table 3). When political orientation was included in the fourth model, the importance of household income diminished, with political orientation appearing to significantly affect both VHI uptake and the attitude towards increased health care tax (Model 4, Table 3).

To confirm the robustness of these results to alternative model specifications, multinomial logistic regressions were conducted. Comparing insurance holders and non-holders, insurance holders were found to have a higher probability of reporting that increased taxation was a bad idea (see Table 4). This was significant ($p < 0.05$) for the bivariate model (Model 1) and when age, sex and self-rated health were included (Model 2), but the effects lost their statistical significance when household income and education were added (Model 3). When including political orientation in the fourth model, the difference between insurance holders' and non-holders' attitude to health care tax diminished further, implying that political orientation, too, was associated with willingness to pay for health care. Thus, both the OLS analysis and the multinomial logistic regression point in the same direction: that having VHI did not affect the attitude towards increased health care taxation when income, education and political orientation were controlled for.

3.2 Does VHI unburden the public health care system?

To answer the second research question, regarding the use of the public health care system on part of VHI holders, a logistic regression was conducted with public health care use as the outcome variable. The results showed that those with a VHI had significantly lower probability,

Table 2. Cross-table VHI and willingness to pay health care tax

Willingness pay tax	Key to table	No VHI	VHI	Total
Very good	Frequency	131	24	155
	Row %	85%	15%	100%
	Column %	12%	12%	12%
Good	Frequency	289	38	327
	Row %	88%	12%	100%
	Column %	27%	19%	25%
Neither good nor bad	Frequency	319	48	367
	Row %	87%	13%	100%
	Column %	29%	25%	29%
Bad	Frequency	213	55	268
	Row %	79%	21%	100%
	Column %	20%	28%	21%
Very bad	Frequency	132	31	163
	Row %	81%	19%	100%
	Column %	12%	16%	13%
Total	Frequency	1.084	196	1.280
	Column %	100%	100%	

$N = 1280$.

Pearson's $\chi^2 = 12.19$, $p = 0.016$.

compared to those without an insurance, of having used public health care the previous year (see Appendix 1 for full models). These results suggest that VHI does, to some extent, unburden the public health care system in Sweden.

To further explore how VHI affects public health care utilisation, insurance holders' total health care usage was investigated. A cross-table of VHI and private and public health care use showed that 38% of all insurance holders only used public health care services the previous year, 10% only used private health care while 19% used both private and public health care services (see Table 5). Next, VHI holders' total health care usage was estimated and compared with that of non-holders. Controlling for sex, age, health, income and education in a logistic regression, no difference between VHI holders and non-holders regarding total health care usage was found (change in predicted probability: -0.009 ; $p = 0.799$) (see Appendix 2). This supports the results in the first analysis that indicated a substitution effect. VHI holders' health care needs, in total, seem to be similar to those without an insurance, with the difference that they, to some extent, substitute public with private health care. Still, it should be emphasised that no more than 10% of the VHI holders only used private health care the previous year, while 57% continued to visit the public health care sector (see Table 5).

To investigate potential differences between moderate users and frequent users of public health care, an additional outcome variable on public health care usage was explored. First, a cross-tabulation of public health care use and VHI was calculated (see Table 6). It showed that a larger share of the VHI holders never visited public health care compared to non-holders (43% vs 25%), and that a smaller share of the VHI holders were frequent users (7% compared to 20% non-holders). However, for the moderate users, constituting the largest group of respondents (717 of 1335), the differences were smaller. Thus, of those without a VHI, 55% had used public health care one to three times during the previous year, compared to 50% of those with a VHI.

Table 3. OLS models; VHI and willingness to pay health care tax

Variable	Model 1	Model 2	Model 3	Model 4
<i>N</i> (total)	1.280	1.280	1.280	1.280
VHI				
Yes	0.226 (0.016)	0.187 (0.051)	0.122 (0.216)	−0.084 (0.332)
Sex				
Male		0.145 (0.031)	0.119 (0.082)	0.036 (0.543)
Age		−0.003 (0.132)	−0.003 (0.190)	−0.006 (0.004)
Self-assessed health		0.004 (0.828)	−0.004 (0.821)	−0.018 (0.230)
Household income			0.042 (0.001)	0.011 (0.000)
Education				
<Elementary school				
<High school			−0.130 (0.287)	−0.171 (0.109)
<University studies			−0.100 (0.415)	−0.153 (0.154)
<University degree			−0.233 (0.059)	−0.194 (0.074)
Political orientation ^a				
Clearly left				−1.190 (0.000)
Slightly left				−0.606 (0.000)
Neither nor				
Slightly right				0.377 (0.000)
Clearly right				0.920 (0.000)
Constant	2.932 (0.000)	3.008 (0.000)	2.964 (0.000)	3.542 (0.000)

Outcome: IncTax.

p value in bracket.

^aNeither left nor right is reference category.

To control for potential confounders, a multinomial logistic regression was conducted. The results of the analysis align with those above; insurance holders had a higher probability of never having visited the public health care system the previous year, and a lower probability compared to non-holders of having visited the public health care system more than four times. VHI holders and non-holders had similar probabilities of being moderate users (see Table 7).

Taken together, the results presented here indicate that VHI holders used public health care services to a somewhat lower extent than non-holders. This suggests that an unburdening effect of VHI might exist. However, it was also found that 38% of the VHI holders continued to use *only* public health care services and that only 10% of them completely substituted public with private health care services. These results point to public health care still being important for most VHI holders and a possible ‘unburdening effect’ being quite small.

4. Discussion

The aim of this paper was to investigate how VHI affects the public health care system in Sweden with regards to the willingness to contribute financially to it through health care taxes, and its utilisation. The results in the empirical section indicate that having a VHI does not seem to make people less willing to pay income tax towards the public health care system. When controlling for income and political orientation in the Swedish context, no differences were found

Table 4. Marginal change in predicted probabilities for willingness to pay tax, VHI holders vs non-holders

Outcome (y) categories	Model 1		Model 2		Model 3		Model 4	
	Change in Pr(y)	(p value)	Change in Pr(y)	(p value)	Change in Pr(y)	(p value)	Change in Pr(y)	(p value)
Very good	0.002	0.950	-0.000	0.993	0.015	0.598	0.055	0.057
Good	-0.073	0.020	-0.059	0.072	-0.060	0.080	-0.021	0.598
Neither nor	-0.049	0.143	-0.043	0.222	-0.029	0.435	-0.041	0.318
Bad	0.084	0.014	0.078	0.026	0.061	0.088	0.024	0.497
Very bad	0.036	0.192	0.025	0.360	0.014	0.612	-0.017	0.472

N = 1280.

Model 1: outcome: willingness to pay health care tax, IV: VHI.

Model 2: outcome: willingness to pay health care tax, IV: VHI, controls: sex, age, self-assessed health.

Model 3: outcome: willingness to pay health care tax, IV: VHI, controls: sex, age, self-assessed health, household income, education.

Model 4: outcome: willingness to pay health care tax, IV: VHI, controls: sex, age, self-assessed health, household income, education, political orientation.

All other variables held at their mean values.

Table 5. Cross-table VHI and private and public health care use

Private and public use	Key to table	No VHI	VHI	Total
No health care use (neither public nor private)	Frequency	284	68	352
	Row %	81%	19%	100%
	Column %	25%	33%	26%
Only public use	Frequency	832	77	909
	Row %	92%	8%	100%
	Column %	74%	38%	68%
Only private, no public use	Frequency	3	20	23
	Row %	13%	87%	100%
	Column %	<1%	10%	2%
Both public and private use	Frequency	13	38	51
	Row %	25%	75%	100%
	Column %	1%	19%	4%
Total	Frequency	1 132	203	1 335
	Column %	100%	100%	

N = 1335.

Pearson's $\chi^2 = 267$, $p < 0.001$.

between insurance holders' and non-holders' willingness to pay health care taxes. This points to the recent growth in VHI uptake in Sweden not having altered the support for the principle that health care should be financed in a solidaristic manner by all members of society. The findings also suggest that, at least in Sweden, attitudes toward increased health care taxation are more affected by income and political orientation than having a VHI.² These results are in line with the findings of Martinussen and Magnussen (2019) who found that VHI did not alter the support for public health care in Norway. However, the findings differ from those of Hall and Preston

²A VIF test was conducted, no variable exceeded VIF 3.14/1/VIF = 0.318.

Table 6. Cross-table VHI and public health care use

Public health care use	Key to table	No VHI	VHI	Total
Non-user (no visits)	Frequency	287	88	375
	Row %	77%	23%	100%
	Column %	25%	43%	28%
Moderate user (1–3 visits)	Frequency	616	101	717
	Row %	86%	14%	100%
	Column %	55%	50%	54%
Frequent user (>4 visits)	Frequency	229	14	243
	Row %	94%	6%	100%
	Column %	20%	7%	18%
Total	Frequency	1 132	203	1 335
	Column %	100%	100%	

N = 1335.

Pearson's $\chi^2 = 37.35$, $p < 0.001$.

Table 7. Marginal change in predicted probabilities for public health care use, VHI vs no VHI

Outcome (y) categories	VHI vs no VHI		Base-value (predicted y at base)
	Change in Pr(y)	(p value)	
Non-user	0.098	0.010	0.266
Moderate user	−0.009	0.826	0.580
Frequent user	−0.089	0.000	0.154

N = 1335.

Outcome: public health care use, IV: VHI, controls: sex, age, self-assessed health, household income, education.

All other variables held at their mean values.

(1998) who found insurance holders in the UK to be less positive towards public spending on health care. Hall and Preston did not however control for political orientation as was done in this study (Hall and Preston, 1998).

The differences between the Swedish, Norwegian and British cases with regards to attitudes towards public spending on health care among VHI holders can also be explained by the fact that the majority of VHI holders in Sweden and Norway have an employer-sponsored VHI, meaning that they neither bear its full cost, nor have taken the active decision to buy VHI themselves (Alexandersen *et al.*, 2016). Another possible explanation as to why no association between having a VHI and willingness to pay health care taxes was found in Sweden is that Swedish VHI does not cover all types of medical treatments. Pre-existing conditions, acute care services, treatment for chronic conditions and many other treatments for serious diseases, including most types of cancer for instance, are excluded. This means that VHI holders are still dependent on the public health care system for many conditions (Kullberg *et al.* 2019).

The second main finding in the paper is that VHI in Sweden appears to have a slight unburdening effect on the public health care use. It was found that VHI holders appeared to use public health care services to a lower extent than non-holders. It was also shown, however, that the majority of the VHI holders continued to use services within the public health care system even though they had access to privately funded clinics. There are several possible explanations

for this. First, VHI in Sweden covers a rather limited spectrum of health care services, making it necessary for VHI holders to turn to the public health care system for many medical treatments. This might explain why the results in this study differ from patterns found in Spain (Costa-Font, 2004; Cantarero-Prieto *et al.*, 2017) and Australia (Eldridge *et al.*, 2016; Doiron and Kettlewell, 2018), where a distinct unburdening effect was noticed. In addition, as pre-existing medical conditions are excluded from VHI, all insured individuals' previously diagnosed diseases must continue to be treated in the public health care system.

A second possible explanation for the small unburdening effect in Sweden can be derived from Roemer's Law, which states that demand for health care is endless and that increased supply therefore always leads to increased demand (Roemer, 1961). According to this logic, it is not surprising if VHI holders in Sweden use their private insurance to complement, or 'top up' the public health care system, rather than to substitute public health care services with privately financed ones. Along similar lines, it can be speculated that a moral hazard effect is at play, which would imply that individuals obtaining VHI increase their health care consumption as they get access to higher levels of protection against health risks (Colombo and Tapay, 2004).

Taken together, the results of this study suggest that, so far, the effects of increased VHI uptake on the public health care system in Sweden are rather limited. It does not appear that those with a VHI are less willing to contribute to the public system through health care taxes. Although an unburdening effect of VHI on public health care usage was observed, a large group of VHI holders still used the public system regularly to meet their need for health care. These results imply that there is no evidence as of yet that the increased use of VHI in Sweden has set in motion a 'vicious circle' where an increasing share of the population turn to private health care markets, leading the public sector to lose resources and eventually become a low-quality alternative for those who cannot afford private insurance (Propper, 2000; Propper and Green, 2001).

Regardless of whether VHI affects peoples' willingness to fund the public health care system or relieves pressure on the system through substitution, the mere existence of a privately funded health care sector alongside the public system can be said to undermine its equity. A two-tier system implies that some parts of the population have access to health services offered more promptly and, in some cases at least, with better quality than in the public system. Thus, in the Swedish context, where equity and solidarity have been core principles in the construction of the public health care system, a parallel private sector clearly challenges these values.

Regarding the future of VHI in Sweden, several developments indicate that the market for VHI may continue to grow. First, recent public debates in Sweden show that there is an increasing number of political actors who openly advocate a more mixed financing system within the health care sector, indicating that they would like VHI to play a bigger role (Gustafsson, 2019; Pihl, 2019; Sigfrid, 2019; Dousa, 2020). Second, waiting times for health care services have recently grown again in Sweden, a factor that previously has been found to stimulate VHI uptake (Besley *et al.*, 1996; Jofre-Bonet, 2000). These circumstances indicate that the growth of the private health care market in Sweden is likely to continue. If this happens there is also a risk that the current challenges to recruit medical staff – both nurses and doctors – to some areas in Sweden will increase.

Other factors that might influence the development of the VHI sector in Sweden are future regulations of the VHI market and general supply of private health care services in Sweden. If the range of services offered within the privately financed sector expands, and waiting lines to public health care still remains, VHI will become more attractive both to employers and individuals. This might lead to a development where willingness to pay taxes towards the public sector decreases, despite the fact public support for the public health care system has long been high (Svallfors, 2011). Thus, in the long-run, the legitimacy and the stability of the tax-funded health care system are dependent on more factors than its history of high public support. More studies

are needed to look closer into the mechanisms which determine people's willingness to utilise and pay taxes for public health services if there are other alternatives available.

4.1 Limitations

The main limitation of this study is the relatively small sample in the survey. Since the share of the population in Sweden holding a VHI is still limited, the number in the sample becomes quite small. A second limitation in the study is the cross-sectional design, which means that there are no data tracing the attitudes and behaviour of VHI holders over time, i.e. before and after they got access to VHI. This fact, which depends on the lack of time series data, makes it hard to say for certain what the casual effects of obtaining this type of insurance are. It means, for the first research question, that we cannot assess whether or not insurance holders' attitude to pay health care tax changed after they got access to a VHI. Furthermore, regarding the second research question, it is hard to know to what extent individuals obtaining a VHI shift their use of health services to the private sector and thereby 'unburden' the public sector. It can therefore not be ruled out that the VHI holders used public health care even more prior to obtaining their VHI. In that sense, the data available in Sweden at this point make it hard to say with certainty if there is an unburdening effect or not. A third limitation in the study is that the data do not provide information on insurance holders' pre-existing conditions and for what type of services they use their VHI and when they use public health care services.

5. Conclusion

The findings in this paper suggest that the impact of VHI on the support for tax-based funding of Swedish health care is still quite limited. When taking income and political orientation into consideration, no difference was found between VHI holders and non-holders with regards to the willingness to pay taxes for public health care services. A slight unburdening effect on public health care use was observed, with insurance holders tending to use public health care to a lesser extent than non-holders. The difference, however, can be considered quite small since the vast majority of the VHI holders continued to use the public health care system. Taken together, it seems like the effects of an increased use of VHI are, so far, quite limited to the public health care system in Sweden.

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