Does home care policy generosity impact acute care use?

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1 Introduction

Population aging is putting increasing pressure on the health care systems of most OECD countries, including Switzerland. Population aging not only means that the number of people who need health care services will increase, but also that the increase in health care costs will be financed by a smaller share of the population. Some policy makers see home care (HC) as one of the ways of limiting the growth in health care costs. This may be true if HC can substitute for some more intensive and costly forms of care, such as acute care. Moreover, HC is a way of providing care in a setting typically preferred by the patients – their homes. In Switzerland, HC expenditures have more than doubled between 1997 and 2011; from 1.9% of total health care expenditures in 1997, to 2.7% in 2011, or 0.3% of the Swiss GDP.

We assess the effect of home care policy (HCP) generosity on hospitalizations and doctor visits. HCP generosity stands for a country’s overall commitment to HC, typically measured by HC spending or consumption, as a mean of providing care to its population. Overall, there is little evidence on the causal effect of HCP generosity on hospitalizations and doctor visits. Firstly, most studies don’t address the potential endogeneity of HCP. Secondly, most research has limited generalizability. For example, most studies focus on one specific type of HC, or consider specific populations. The main contribution of this work is to consider all forms of HC, regardless of the payers (public, health insurance, out-of-pocket), and the whole adult population. Furthermore, we compare the effect of two forms of HC: medically- and non-medically-related. We consider all hospitalizations, i.e. both acute and post-acute inpatient care, and all doctor visits, i.e. to the general practitioner (GP) and to specialists.

The analysis is conducted on data from Switzerland, a federal country where health care policy is decentralized in 26 cantons (i.e. states). Decentralization results in variation of HCP generosity across cantons, as well
as over time, which we use to identify the effect of HCP. For example in 2007, the canton of Schwyz provided 0.9 hours of HC per capita, and the canton of Jura 3.6 hours. From 1997 to 2007, this measure decreased by 30 percent in Geneva and grew by 282 percent in Ticino.

In Switzerland, average length of hospital stay has decreased over the years – e.g. from 12.7 days in 2002 to 10.9 days in 2007 (Morger, 2009) – but remains the highest among western countries (OECD, 2012). Also, the proportion of outpatient cases on total hospital cases is low compared to other OECD countries. Therefore, there is some potential for reducing LOS through the development of efficient ways to deliver care in other less costly settings – e.g. ambulatory care (OECD and WHO, 2011).

We estimate two-part models (2PM) to determine the impact of canton HCP generosity on the individual likelihood of hospitalization and length-of-stay (LOS), conditional on hospitalization, and similarly for doctor visits. The endogeneity of HCP generosity is addressed through instrumental variables combined with canton and time fixed effects.

2 Background

Home care (HC) is care provided in the patient’s home. Throughout this paper, we use HC as the short form for formal home care, i.e. services that are paid for. There are mainly two types of HC services: medically-related – e.g. nurse visits – and non-medically-related – mainly help with the activities of daily living (ADLs: eating, dressing, transferring, bathing and toileting) and the instrumental activities of daily living (IADLs: housekeeping, cooking, taking medicine, shopping, using the phone and managing money).

2.1 Home care and hospitalizations

Inpatient care, i.e. care provided in the hospital with overnight stay, may include both acute and post-acute care. Acute care consists of an actual medical intervention aiming at restoring a patient’s health – e.g. a hip replacement surgery. Post-acute care is medically- or non-medically-related care associated with the patient’s rehabilitation, and can take place in diverse settings. Here we consider post-acute care provided in the hospital. Inpatient care use can be analyzed empirically by looking at the likelihood of hospitalization and at the length of hospital stay (LOS). In general, hospitalization is triggered by a need for acute care; LOS depends on the
severity of the condition, how much care is required to address it, and whether rehabilitation takes place at the hospital or in another setting.

HC may be a substitute or a complement to inpatient care, depending on whether HC use reduces or increases the use of inpatient care. The likelihood of hospitalization may be affected by HC use in at least two ways. On one hand, HC providers can detect early symptoms and address them at the patient’s home, avoiding the development of a serious condition that would require hospitalization. For example, proper care of a chronic condition, such as diabetes, through appropriate diet and medication, can avoid hospitalizations related to that condition (Konetzka et al., 2008). On the other hand, in some cases, HC providers may detect the presence of a condition and initiate hospitalization. This effect may be small in less serious cases, because HC providers may have a bigger incentive to provide care themselves. In sum, HC may be a substitute or a complement to hospitalizations.

HC use may influence LOS through at least two channels. First, if a health condition is detected by the HC providers at an early stage, less acute care may be required to address it. Second, HC can make discharge possible at an earlier stage by allowing for some post-acute care (typically less intensive) to be provided at the patient’s home. In short, HC is likely to be a substitute to longer LOS. The strength of these relationships may depend on the type of HC – medically- or non-medically-related. A priori, medically-related HC is likely to be a better substitute to LOS, compared to non-medically-related HC.

2.2 Home care and doctor visits

Doctor visits include both visits to GPs and to specialists. In general, a doctor visit is triggered by a need for non-emergency healthcare. The choice to visit the doctor may be related to the individual’s perception of the severity of her health problem, as well as her expectations regarding what the doctor may be able to do about it, compared to an emergency department or a pharmacist, for example. The number of doctor visits may be related to the management of chronic conditions (Scott, 2000). Finally, patients may also go to the doctor for the purpose of obtaining a referral, for example to a specialist doctor or to HC services.

The likelihood of visiting a doctor may be affected by HC use in two ways. First, the patient may rely on HC instead of seeking a doctor to address her health problem. Second, HC providers may direct the patient
to a doctor if they detect a condition, though this incentive may be limited. The number of doctor visits may be reduced by the use of HC in the case of chronic conditions. However, if the coverage of HC services requires a doctor prescription, as it is the case for most HC services in Switzerland, HC use may be associated with more doctor visits. That is, reverse causality may pose a challenge in identifying the causal effect of HC on doctor visits (section 3.4). Furthermore, if HC substitutes for inpatient care, doctor visits may increase to address medical needs while the patient is at home (Kemper 1988; Wooldridge and Schore 1988). Finally, the relationship between HC and doctor visits may depend on the type of HC (medically- or non-medically-related) and on the type of doctor (family doctor or specialist). In sum, HC may be a substitute or a complement to doctor visits.

2.3 Home care policy in Switzerland

Switzerland is a federal country composed of 26 cantons (similar to the states in the US). Healthcare policy is decentralized; the federal government (i.e. Confederation) defines the general principles and the cantons and communes (the smallest administrative units) are in charge of regulating and financing healthcare. This results in significant variation in use and financing across cantons (Weaver, 2011). This cross-canton variation is also true for HCP.

In addition to the variation in HCP generosity across cantons, there is variation in generosity over time. The general trend has been an expansion of HC services (i.e. increasing generosity). Overall, spending in HC services has expanded by 113% between 1997 and 2011. HC spending accounted for 1.9% of total health care expenditure in 1997, and 2.7% in 2011, or 0.3% of the Swiss GDP (FSO, 2013a, 2013b – authors’ calculations). Though these proportions may seem small, they concern vulnerable populations, such as the elderly and the disabled. Several factors may influence the expansion in HC services. For example, the aging of the baby-boomers, the general increase in life expectancy, the increase in the number of small households (i.e. shrinking networks of potential informal caregivers), and the general preferences of the population to be treated at home may translate into increasing demand for HC services. In addition, some policy makers see the expansion in HC services as a way of limiting the growth in healthcare costs. This is only true if HC can substitute for some more expensive forms of formal care, such as inpatient care or doctor visits.
In Switzerland, the majority of the HC providers are non-for-profit organizations: in 2011, they provided 85% of total HC services. Unlike for-profit providers, they receive public subsidies, as their activity is considered of general importance for the population (FSO, 2012). We only consider HC provided by non-for-profit organizations, because for-profit providers have been surveyed since 2010 only.

In Switzerland, some HC services are covered by compulsory health insurance (CHI). The reimbursement rate is negotiated between CHI and the HC providers in the canton, which results in variation in these rates across cantons. To be covered, the HC services have to be prescribed by a doctor. In general, this is the case with medically-related services, but also some help with ADL limitations that are due to health deterioration. Non-medically-related services are usually not covered by the CHI, although they may be covered by accident insurance, for example. In general, they are payed by the patients and subsidized for low-income individuals. Overall, the financing of HC in Switzerland is complex. The cantons and communes may directly subsidize HC providers. The Confederation provides two types of direct subsidies to patients – the ‘allowance for impairment’, for persons with moderate or severe disabilities, and ‘supplemental benefits’, for low-income retired or disabled persons. Some cantons provide additional ‘supplemental benefits’. The last public source of funding is indirect subsidizing of patients, as the price of non-covered services (e.g. help with IADL limitations) may depend on the patient’s income, wealth and subsidies received. Besides CHI, the other payers are the compulsory accident insurance, financed by employers and covering accident and illness related to work, the non-work-related accident insurance, and the military insurance, covering for example the soldiers and peace workers. In 2008, 47% of total HC costs were covered by direct subsidies to providers, 36% by CHI, 7% by direct subsidies to individuals, 6% by out-of-pocket spending, and the remainder by other payers (Weaver, 2011).

### 2.4 Overview of existing literature

In general, there is little empirical evidence on the relationship between HC and acute care use, and most research has been conducted in the US. The Channeling Demonstration – a social experiment conducted in the US in the early 1980s – is among the early attempts to assessing the effect of increasing generosity of HCP on various types of health care utilization. The experiment did not significantly affect hospitalizations or doctor visits
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(Carcagno and Kemper, 1988; Wooldridge and Schore, 1988; Kemper, 1988; Weissert et al., 1997).

Some recent studies looking at Medicare Home Health (HH) in the US use changes in the reimbursement of HH agencies in 1997 and 2000 to identify changes in HCP generosity. HH is a specific type of HC, generally related to post-acute care. Buntin et al. (2009), using a sample of stroke, hip fracture and joint replacement patients, find that the reimbursement changes in 1997 increased the probability of receiving inpatient post-acute care while those of 2000 decreased that probability. Kilgore et al. (2009), using a sample of older cancer patients, also find an increase in the probability of receiving inpatient post-acute care following the 1997 reimbursement changes. McKnight (2006) finds no significant effects of the 1997 changes on inpatient care or doctor expenditures. Finally, Huckfeldt et al. (2014) find no evidence of causal effects of either reimbursement change on inpatient post-acute care settings.

There are also a few recent studies looking at Medicaid home- and community-based services (HCBS) in the US. D’Souza et al. (2009) find some evidence of increased hospital use as a result of a decrease in the generosity of Michigan’s Medicaid HCBS waiver for the aged and disabled. Felix et al. (2011) find non-significant differences between inpatient or doctor expenditures of participants in the Arkansas Community Connector Program and those of the control group. Shapiro et al. (2011) analyse five Medicaid HCBS programs in the state of Florida. The authors find significantly higher inpatient expenditures among users of HCBS under one of the programs (the Older Americans Act IIIB), compared to eligibles in the waiting list of that program; they find non-significant effects for the four other programs. Doctor expenditures don’t differ between treatments and controls in any of the five programs. Xu et al. (2010) is another recent study related to Medicaid. It uses a sample of patients who enrolled in the Aged and Disabled HCBS waiver program in Indiana between 2002 and 2004, and uses actual individual use of HC services to assess the relationship between this type of care and inpatient care use. The authors find that more attendant care, homemaking services, and home-delivered meals were associated with lower risk of hospital admissions, as measured by time-to-hospital-admission since enrollment in the waiver program.

Studies on the relationship between HC and acute care use are particularly scarce in Europe. For example, Stuck et al. (2000) and Vass et al. (2008) are two randomized controlled trials (RCT) conducted in Switzerland and Denmark, respectively. Both find non-significant effects of home
preventive visits on hospitalizations. Stuck et al. (2000) finds a positive
effect of home preventive visits on the number of doctor visits. Overall,
evidence on the causal effect of increasing HCP generosity on acute care
use is limited and inconclusive.

Some of the findings cannot be interpreted as actual effects of increasing
or decreasing generosity because the potential endogeneity of HCP is not
tackled. Furthermore, existing studies assess the effects of specific HC
programs or interventions, which include only certain types of HC services
– e.g. Medicare HH –, serve specific populations – e.g. the Medicaid
waivers for the aged and the disabled –, or occur in particular contexts
– e.g. the Channeling Demonstration or RCTs. Also, some studies look
only at particular types of inpatient care – e.g. post-acute care. In short,
existing evidence has limited generalizability.

2.5 Main contributions and hypothesis

We use the variation of HCP generosity over time and across cantons to
assess its effects on acute care use – hospitalizations and doctor visits.
The underlying assumption is that in cantons with more generous HCP
individuals are more likely to use HC services. Existing literature provides
evidence in favor of this assumption (e.g. Corson et al., 1988; Huckfeldt
et al., 2014; Kemper, 1988; McKnight, 2006; Muramatsu and Campbell,
2002; Rice et al., 2009; Stabile et al., 2006). We look at HCP generosity
instead of actual individual HC use for two many reasons. First, we are
interested in the effect of HCP per se, in particular the interplay of different
dimensions of HCP generosity, such as medically- versus non-medically-
related HC, and intensity versus coverage/penetration rate of HC services.
Second, it is challenging to identify causality at the individual level. Any
individual-level variables which may explain HC use are likely to influence
acute care use through their correlation with informal care use.

This study fills a gap in the existing literature by analyzing all types of
inpatient care (acute and non-acute) and doctor visits, taking into account
all types of HC services, and looking at the entire adult population. In
addition, we investigate the potentially different effects of medically- and
non-medically-related HC services on acute care use.

Based on the discussion in sections 2.1 and 2.2, we test the hypotheses
listed below. Regarding hospitalizations, we expect that more generous
HCP

H1 impacts the likelihood of hospitalization, but the sign is a priori un-
known; and

**H2** reduces LOS, conditional on hospitalization. Finally,

**H3** medically-related HC has a stronger negative effect on LOS compared to non-medically-related care.

Regarding doctor visits, we expect that more generous HCP

**D1** impacts the likelihood of any doctor visit, but the sign is a priori unknown;

**D2** impacts the number of doctor visits, conditional on having any, but the sign is a priori unknown; and

**D3** has a different effect on doctor visits by type of HC and by type of doctor (GP, specialist).

## 3 Methodology

### 3.1 Model

We estimate 2PMs at the individual-level, with HCP being measured at the canton-level. Such models are appropriate when the dependent variable has a large mass of zeros (Duan et al., 1984). For example, the proportions of individuals who are not hospitalized or don’t visit a specialist in a given year are 88% and 67%. The 2PM is the following:

$$Pr[y_{i,c,t} > 0 | HCP_{c,t}, X_{i,c,t}] = \Phi(\alpha + HCP_{c,t}\beta + X_{i,c,t}\eta) \quad (1)$$

$$\ln[y_{i,c,t} | y_{i,c,t} > 0, HCP_{c,t}, X_{i,c,t}] = \gamma + HCP_{c,t}\delta + X_{i,c,t}\lambda + \varepsilon_{i,c,t} \quad (2)$$

The subscripts $i$, $c$ and $t$ denote the individual, canton of residence, and survey year, respectively. $y$ can be one of four outcomes: (i) hospitalization, which requires spending at least one night in the hospital, (ii) any type of doctor visits, (iii) GP visits, and (iv) specialist visits. In the first part of the model, the dependent variable is a binary indicator, which takes value 1 if the individual was hospitalized or had a doctor visit in the past 12 months. That is, equation (1) is a probit model, which predicts the likelihood of hospitalization or having a doctor visit. In the second part, the dependent variable is logged to reduce the influence of outliers. Equation (2) is a linear
model, which predicts the natural logarithm of length of stay or number of
doctor visits over the past 12 months, conditional on hospitalization or any
visit. $HCP_{c,t}$ represents the canton-level HCP indicators (section 3.2) and
$X_{i,c,t}$ is a vector of individual-level covariates (section 3.3). In addition,
there are canton and time fixed effects.

The coefficients of interest are $\beta$ and $\delta$. To test hypotheses H1 and
H2, $HCP_{c,t}$ is a scalar – i.e. a single indicator of general HCP generosity.
While the sign of $\beta$ is a priori unknown (H1), $\delta$ is expected to be negative
(H2). To test hypothesis H3, the same model is run with $HCP_{c,t}$ being a
vector of two indicators, related to medically- and non-medically-related
HC services generosity in the canton. Hypothesis H3 is verified if the
coefficient on medically-related HC is significantly larger than the one on
non-medically-related HC, in absolute terms. To test hypotheses D1-D3 six
regressions are run, in which $y$ is doctor visits, GP visits or specialist visits.
$HCP_{c,t}$ is either a scalar or a vector of medically- and non-medically-related
indicators of generosity, as in the hospitalizations model.

### 3.2 Home care policy generosity

Canton HCP generosity stands for a canton’s overall commitment to HC as
a means of providing care to its population. One way of defining HCP gen-
erosity is by the amount of HC services provided in a canton in a given year,
adjusted by the size of that canton’s population. We use three indicators
of HCP generosity. We start with a general indicator of generosity defined
by the number of hours of HC services per capita ($hourspc$), in canton $c$,
in year $t$. Then, we decompose that indicator into the number of hours
of medically-related HC services per capita ($mrhourspc$) and the number
of hours of non-medically-related HC services per capita ($nmrhourspc$), in
canton $c$, in year $t$ ($hourspc = mrhourspc + nmrhourspc$). The three indi-
cators are logged, to reduce the influence of outliers. This means that in
the second part of the model, $\delta$ is directly interpretable as an elasticity.

The literature on HCP generosity typically uses spending to represent the
overall financial commitment of states or Canadian provinces to HC
programs (e.g. Kemper et al., 2008; Muramatsu and Campbell, 2002; Mu-
ramatsu et al., 2007; Pezzin and Kasper, 2002; Reschovsky, 1998; Stabile
et al., 2006). We prefer hours over spending because variation in HC spend-
ing across cantons is partly driven by their different levels of salaries; i.e.
hours is closer to an actual measure of care provided compared to spending.
3.3 Individual-level explanatory variables

The vector of individual-level covariates, $X_{i,c,t}$, includes indicators of informal care availability, health status and behavior, socio-demographics, and pressure to remain at or return home (Weaver and Weaver, 2013). The model includes canton and wave fixed-effects (see section 3.4).

Availability of informal care is a binary indicator, which takes value 1 if there is at least another adult (defined as a person aged 18+) living in the same household. Health status is measured by the following set of indicators: self-assessed health (good, fair or poor); degree of physical troubles such as backache and diarrhea (few troubles, some troubles, many troubles); whether the person suffers from limitations in any of three ADLs – eating, transferring and dressing; and whether the person is not able to walk for at least 200 meters. Medical conditions such as osteoporosis and bronchitis have a large proportion of missing values (19-29% depending on the wave) and are not included (see section 4). Health behavior is measured by three binary indicators: being obese ($\text{BMI} \geq 30$); being a smoker or ex-smoker; and drinking more than the daily alcohol recommendation (two ‘standard drinks’ for men and one for women; with one standard drink corresponding to 10g of alcohol). Physical activity is not available for every wave and is not included.

Socio-demographics include interaction terms between gender and age groups (<40, 40-64, 65+); nationality (Swiss or foreign); residential area (urban or rural); education (primary, secondary and tertiary); income, in net yearly individual-equivalent amounts\(^1\), in 10k Swiss francs (2007 prices), specified in logarithmic form; and two binary indicators related to health insurance: having supplemental insurance allowing for choice of hospital and supplemental insurance covering stay in a (semi-)private room. The reference category is standard CHI coverage (shared room without choice of hospital). The type of supplemental coverage for hospitalization is also included in the doctor visits models to proxy for the generosity of health insurance. Marital status is closely related to informal care availability and was excluded (e.g. 98% of the married live with another adult and most of the single, widowed and divorced live alone). Language (german, french or italian, which are the three main national languages) is not needed once canton fixed-effects are included. The level of health insurance deductible has a large proportion of missings (18%) and is only included in a sensitivity check. Indicators of pressure to remain at or return home

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\(^1\)We use individual-equivalent amounts instead of household income because for the former there are imputations in the dataset, which we use in order not to loose as many observations.
include having children younger than 15 – the effect being allowed to differ between men and women –, and having a full-time, part-time or no job.

At least two individual-level variables may be endogenous: informal care availability and supplemental health insurance. Unobserved health characteristics may influence acute care use, as well as the choice to co-reside with another adult who may provide help and the decision to buy supplemental coverage. Furthermore, living arrangement and supplemental coverage may be influenced by acute care use (reverse causality). As a sensitivity check, we remove these variables from the model and see how the coefficients on HCP are affected.

3.4 Endogeneity of HCP

In our study, there are two main sources of endogeneity. The first is unobserved heterogeneity. Other components of canton health policy may be related to both canton HCP generosity and individual demand for acute care. For example, cantons are in charge of the planning of hospital beds and doctor offices (Weaver and Weaver, 2013). Furthermore, Switzerland’s three main linguistic regions – German, French and Italian – have different traditions, cultural habits and political preferences which may influence both health care utilization and health policy, including HCP (Jaccard-Ruedin et al., 2006; Weaver and Weaver, 2013).

The second possible source of bias is reverse causality, i.e. the risk that acute care use may influence HCP. Concretely, cantons may define HCP generosity based on some aggregate of need of the canton population (Stabile et al., 2006). In the case of doctor visits, there is another risk of reverse causality, as in Switzerland the reimbursement of most medically-related HC services by CHI requires a doctor prescription. That is, doctor visits related to referrals to HC services directly influence HC use.

The use of canton fixed-effects controls for unobserved canton characteristics which are constant over time, in particular systematic differences in preferences and health policy choices across cantons. Time fixed-effects adjust for the changes that may impact HCP and acute care use in a similar fashion across cantons, such as medical innovation and economic growth. To address any remaining endogeneity, the model is estimated using an instrumental variable (IV) strategy (section 3.5).
3.5 Instrumental variables

The use of IV requires finding relevant and valid instruments – variables that explain HCP generosity and are validly excluded from the main equations. At least as many instruments as endogenous indicators are required to identify the model. Since one of our specifications of HCP generosity includes two indicators – medically- and non-medically-related HC hours per capita –, we need at least two instruments. Our goal is to find at least three, in order to conduct overidentification tests. In this study, the endogenous variables are at the canton-level, and the model includes canton-fixed effects. This implies that strong instruments need to show enough variation over time within cantons – variation across cantons is not enough.

Besley and Case (2000) suggest exploiting the fact that women’s involvement in politics has an effect on policy making to devise instruments for endogenous policy. Following these authors, we consider the following instrument: the proportion of seats in the cantons’ legislative bodies occupied by women. Along the same lines, we look at the proportion of seats in the cantons’ legislative bodies occupied by left-wing-oriented politicians. We also consider the cantons’ per capita spending in education, which captures cantons’ budgeting decisions; the cantons’ resource index, a measure of tax capacity and an indicator of the cantons’ economic situation; and the proportion of 80+ population among the 65+ population, an indicator of aggregate need of the elderly population – similar instruments can be found in Stabile et al. (2006).

The validity of these instruments may be debated. There are other channels beyond HCP generosity through which the indicators may influence acute care use, namely through other components of health policy (e.g. Miller 2005; see also section 3.4). Nonetheless, canton health policy is relatively stable over time and its effects are captured by the canton fixed-effects. For example, the number of hospital beds and doctors per capita are rather constant over time within most cantons (figures 1 and 2 in appendix). As a sensitivity check, we include these variables in the models of hospitalizations and doctor visits, respectively, to see how the coefficients on HCP are affected.

The IV probits are estimated using the two-stage residual inclusion (2SRI) approach (Terza et al., 2008), and the second part of the 2PMs is estimated using conventional two-stage least squares (2SLS).
3.6 Sensitivity analyses

[To be completed. See section 5.5.]

4 Data

The analyses are conducted on data from the Swiss Health Survey (SHS)\(^2\), which focuses on health status and behaviors of the population, health care use and health insurance. The SHS has a repeated cross-section design. Phone interviews are conducted with a single member of each household, selected randomly, as long as that member is at least 15 years old. The respondent is also invited to answer a written questionnaire. Because not everyone fills it in, some variables – e.g. medical conditions – have large proportions of missing values. Data were first collected in 1992, and every five years since. This study uses three waves of the survey: 1997, 2002 and 2007, as we only have HCP data since 1997.

We restrict our sample to adults (20 years and older). In fact, while HC agencies serve patients of every age, the proportion of 20+ patients, in the years 1997, 2002 and 2007, is at least 90% in all but 6 canton-year observations (out of 78)\(^3\). Observations with income below 6’000 Swiss francs are dropped, as well as lengths of stay beyond 180 days (7 observations). The final sample sizes vary by outcome and are shown in table 2.

The HCP indicators come from the Federal Statistical Office’s Home Care Statistics – Spitex data\(^4\). Other canton-level indicators come from multiple surveys of the Federal Statistical Office. These data are publicly available at www.bfs.admin.ch.

5 Results

5.1 Descriptive statistics

For brevity, here, we only present the descriptive statistics of the HCP indicators and the dependent variables. Means and standard deviations of the right-hand side individual-level variables are shown in table 6, in appendix.

\(^2\)http://www.bfs.admin.ch/bfs/portal/fr/index/infothek/erhebungen_quellen/blank/blank/ess/04.html
\(^3\)The exceptions are (1) the canton Obwalden in all three years, with proportions of 20+ patients between 70% and 78%; (2) the canton Valais in 1997 and 2002, with 75% and 83%; and (3) the canton Fribourg in 1997, with 89%.
\(^4\)http://www.bfs.admin.ch/bfs/portal/fr/index/infothek/erhebungen_quellen/blank/blank/spitex/01.html
The HCP indicators show considerable variation (table 1). Total HC hours per capita vary between 0.36 and 4.11. The number of medically-related HC hours per capita (0.05-2.57 hours) tends to be higher than the number of non-medically-related HC hours per capita (0-1.64 hours). Pooling all years and cantons, the correlation between medically- and non-medically-related HC hours per capita is 0.51.

About 12% of the sample was hospitalized in the 12 months preceding the interview. Among hospitalized individuals, average LOS was 10 days. Around 78% of the individuals had a doctor visit over the previous 12 months, 63% had a GP visit and 33% had a specialist visit. The average number of doctor visits among the sample of users was 5 for any kind of doctor and below 4 for GPs or specialists (table 2).

5.2 Specification tests

The specification tests – instruments’ strength, validity of the exclusion restrictions, and exogeneity of HCP – are shown in tables 3 and 4. In general, the instruments are strong – the smallest F-statistic is 73.8 in the LOS equation with one indicator of HCP generosity (table 3).

We require that our final set of instruments passes the overidentifying restrictions test, with p-values above 0.1, in all equations. This is why in the third columns of tables 3 and 4 none of the test statistics is statistically significant. The final set includes four instruments: the proportion of seats in the cantons’ legislative bodies occupied by left-wing politicians, the cantons’ per capita spending in education, the cantons’ resource index, and the proportion of 80+ population among the 65+ population.

When considering a single indicator of HCP generosity, total HC hours per capita, we detect endogeneity in the equations of hospitalizations, doctor visits and GP visits in one or both parts of the 2PM (table 3). When we consider both medically- and non-medically-related HC hours per capita, we reject exogeneity of HCP in the equations of doctor visits and GP visits (table 4). As mentioned in section 3.4, in Switzerland, CHI reimburses HC services if prescribed by a doctor. That is why we expect to find evidence of reverse causality when looking at GP visits, and doctor visits as they include GP visits. Therefore, we are not surprised that we reject exogeneity of HCP generosity when looking at these two outcomes. For the outcomes for which we reject exogeneity of HCP generosity in one of the equations, we interpret the IV probit/2SLS results. Therefore in the next section we interpret the IV results for all outcomes but specialist visits.
5.3 Effect of HCP generosity on hospitalizations

The estimated effect of HCP generosity on the likelihood of hospitalization is not statistically significant at the 90% level (tables 2 and 5). Regarding LOS, the 2SLS results indicate that a 10% increase in per capita HC hours reduces LOS by approximately 7% (table 2). This effect seems to be driven by medically-related HC only: a 10% increase in per capita medically-related HC hours reduces LOS by 4.7%, while the coefficient on per capita non-medically-related HC hours is not statistically different from zero (table 5).

The individual-level covariates have the expected signs. The main determinants of both likelihood of hospitalization and LOS are health status, age and gender, having supplemental insurance covering stay in a private hospital room, and having a job (part- or full-time). Other important determinants of the likelihood of hospitalization are health behavior and having children. Availability of informal care (as captured by living with another adult) has no effect on the likelihood of hospitalization but is associated with significantly lower LOS. This is in accordance with the findings of Weaver and Weaver (2013) for Switzerland. Finally, there are significant differences in both likelihood of hospitalization and LOS across cantons, as indicated by the tests of joint significance of the canton fixed-effects. These results are not shown but are available upon request.

5.4 Effect of HCP generosity on doctor visits

We find some evidence of a negative effect of HCP generosity on the likelihood of having a doctor visit, which seems to be solely driven by a negative effect on the likelihood of any specialist visit; there is no effect on GP visits. The number of doctor visits significantly increases with HCP generosity (by almost 3% for a 10% increase in per capita HC hours), but we find no effects on GP or specialist visits (table 2). When decomposing the HCP generosity indicator into medically- and non-medically-related HC hours per capita there are no significant effects on either the likelihood of having a visit or the number of visits (table 5).

Overall, the individual-level covariates have the expected signs. Informal care availability has a positive coefficient in the first part of the 2PM for doctor visits, but it loses its significance when considering GP visits or specialist visits separately. Informal care is negatively associated with the number of doctor visits, GP visits and specialist visits. These findings are somewhat in line with those of Van Houtven and Norton (2004).
health status and behavior are related to higher likelihood of any doctor visit and number of visits, including GP and specialist visits. Age is positively associated with the likelihood of any doctor or GP visit and the number of doctor or GP visits, as well as being a woman; but the opposite is true for specialist visits. Swiss nationality only has a positive impact on the number of specialist visits. Living in rural areas is associated with lower likelihood of having a doctor or specialist visit, but not a GP visit. Education has a negative effect on both parts of the 2PMs for doctor and GP visits, but a positive effect on both parts of the 2PM for specialist visits. Income and supplemental health insurance are positively associated with all types of visits in the first part of the 2PMs. In the second part, income only affects (negatively) the number of GP visits, and supplemental insurance only affects (positively) doctor visits in general. Having children and working tend to be associated with lower likelihood of any visit as well as number of visits. Finally, there are significant differences in both likelihood of any visit and number of visits across cantons, as indicated by the tests of joint significance of the canton fixed-effects. These results are not shown but are available upon request.

5.5 Sensitivity checks

[To be completed.]

We exclude from the models two individual-level variables that are potentially endogenous: informal care availability and supplemental health insurance coverage (section 3.3). We also include the health insurance deductible levels, which have a large proportion of missing values and were excluded from the main equations. The objective is to observe whether the estimates on HCP generosity are modified by the presence or absence of these variables. The results for any outcome considered are not impacted by the inclusion or exclusion of the variables.

Including the number of hospital beds per capita and the number of doctors per capita in the equations does not affect the estimated coefficients on HCP generosity (section 3.5). The possibly confounding effects of these variables seem to be well captured by the canton fixed effects. To further investigate this issue, we will estimate our models on subsets of cantons according to their trends in some indicators of health policy, such as those in figures 1 and 2 in appendix.
6 Discussion

This paper investigates the effect of canton HCP generosity on hospitalizations and doctor visits, using data from Switzerland. All types of HC, hospital inpatient care (both acute and post-acute) and doctor visits are considered, and we look at the whole adult population. Most importantly, the endogeneity of HCP generosity is explicitly addressed through the use of IV, combined with canton and time fixed effects. Finally, we compare the effects of medically- and non-medically-related HC on acute care use.

Our hypotheses regarding hospitalizations are generally confirmed. We find that HCP generosity does not impact the likelihood of hospitalization but significantly reduces LOS. A 10 percent increase in per capita HC hours reduces LOS by 7 percent. A back-of-the-envelop calculation can help seize this effect. In 2007, Switzerland provided almost 12.3 million HC hours to a population of almost 7.6 million, i.e. nearly 1.62 HC hours per capita. Holding other things constant and assuming a constant population, an increase of 10% corresponds to 1.23 million additional HC hours per year, or extra 120.5 million Swiss francs (using average costs per hour of HC in 2007 equal to 98 Swiss francs). Average daily inpatient care costs were 1,380 Swiss francs in 2007 (Weaver and Weaver, 2013), and there were almost 1.2 million hospitalization cases (Morger, 2009). Given a mean LOS of 10 days, inpatient care savings may round 1.16 billion Swiss francs (0.7 days \times 1,380 Swiss francs \times 1.2 million hospitalizations). Although finer estimations are needed to precisely estimate the cost saving potential of the expansion in HC services, this rough calculation implies overall potential net savings of 1.04 billion Swiss francs, which corresponds to 1.9% of total health care expenditures in Switzerland in 2007 or 0.2% of GDP.

The reducing effect of HCP generosity on LOS seems to be solely driven by medically-related HC hours. This effect is not surprising if one considers, for example, a patient needing post-acute care of relatively low intensity: it may be because medically-related HC services are relatively abundant in her canton of residence that she can be discharged earlier and rely on such type of services.

These results suggest that encouraging HC services, in particular medically-related, may be a way to limit LOS and therefore partly substitute for inpatient care. Therefore, the generosity of HCP may be one way of limiting the growth in HC spending in Switzerland. In Switzerland since 2011, post-acute HC, if prescribed by a hospital doctor, is fully covered for a duration of up to two-weeks (Département Fédéral de l’Interieur, 2009).
This policy was implemented as a way to encourage the reduction in LOS. Although our study does not directly assess the effect of this policy change, it informs on the potential of such changes in contributing to the reduction in LOS.

Our preliminary results regarding doctor visits are mostly inconclusive. The main finding is that HCP generosity is endogenous in the equations of doctor visits and GP visits. This seems to confirm that reverse causality is present, because in Switzerland HC services must be prescribed by a doctor to be reimbursed by health insurance. We also find some evidence of a negative effect of HCP generosity on the likelihood of having a specialist visit, which is in line with the hypothesis that when HC services are available, the patient may rely on them instead of seeking a doctor to address a mild health problem. Finally, one possible explanation to the complementarity we find between HCP generosity and the number of doctor visits is that both HC use and doctor visits (i.e. ambulatory care) may increase to address medical needs while the patient is at home, as a result of the substitution of HC for hospital care (Kemper 1988; Wooldridge and Schore 1988).

[Caveats and future research: to be completed.]

References


Tables

Table 1: Minimum, median and maximum of HCP indicators, Spitex 1997, 2002 and 2007

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Min. (canton, year)</th>
<th>Median (canton, year)</th>
<th>Max. (canton, year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total HC hours pc</td>
<td>0.36 (AI, 1997)</td>
<td>1.40 (SH, 2002)</td>
<td>4.11 (JU, 2002)</td>
</tr>
<tr>
<td>MR HC hours pc</td>
<td>0.05 (TI, 1997)</td>
<td>0.70 (LU, 2007)</td>
<td>2.57 (JU, 2002)</td>
</tr>
<tr>
<td>NMR HC hours pc</td>
<td>0.00 (AI, 1997)</td>
<td>0.63 (ZH, 2007)</td>
<td>1.64 (JU, 1997)</td>
</tr>
</tbody>
</table>

(N)MR HC = (Non-)medically-related home care; pc = per capita. AI = Appenzell Innerrhoden; JU = Jura; LU = Luzern; SH = Schaffhausen; TI = Ticino; ZH = Zurich.

Table 2: Effect of HCP generosity on acute care use: ln(total HC hours per capita)

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>N</th>
<th>Mean</th>
<th>Probit/OLS</th>
<th>IV probit/2SLS</th>
<th>Exogeneity rejected</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospitalizations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any hospitalization</td>
<td>42,588</td>
<td>0.12</td>
<td>-0.00297</td>
<td>0.110</td>
<td>No</td>
</tr>
<tr>
<td>LOS</td>
<td>5,310</td>
<td>9.99</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln(LOS)</td>
<td>5,310</td>
<td>0.0507</td>
<td>-0.687*</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Doctor visits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any doctor visit</td>
<td>42,029</td>
<td>0.78</td>
<td>-0.0291</td>
<td>-0.321*</td>
<td>Yes</td>
</tr>
<tr>
<td># doctor visits</td>
<td>32,960</td>
<td>5.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln(# doctor visits)</td>
<td>32,960</td>
<td>0.0779***</td>
<td>0.286***</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Any GP visit</td>
<td>41,773</td>
<td>0.63</td>
<td>-0.0270</td>
<td>-0.0645</td>
<td>No</td>
</tr>
<tr>
<td># GP visits</td>
<td>26,185</td>
<td>3.77</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln(# GP visits)</td>
<td>26,185</td>
<td>-0.0741***</td>
<td>0.134</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Any specialist visit</td>
<td>41,194</td>
<td>0.33</td>
<td>-0.0797**</td>
<td>0.160</td>
<td>No</td>
</tr>
<tr>
<td># specialist visits</td>
<td>13,447</td>
<td>3.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln(# specialist visits)</td>
<td>13,447</td>
<td>0.0219</td>
<td>0.207</td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

Standard deviation or standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

* p < 0.10
Table 3: Instrument strength, overidentifying restrictions and exogeneity tests: \( \ln(\text{total HC hours per capita}) \)

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Instruments strength ( F(4, , ____) = ___.__ )</th>
<th>Overidentifying restrictions ( \chi^2(3) = ___.__ )</th>
<th>Exogeneity ( \chi^2(1) = ___.__ )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any hospitalization</td>
<td>( F(4, 42530) = 673.01^{***} )</td>
<td>( \chi^2(3) = 5.07 )</td>
<td>( \chi^2(1) = 0.38 )</td>
</tr>
<tr>
<td>( \ln(\text{LOS}) )</td>
<td>( F(4, 5252) = 73.83^{***} )</td>
<td>( \chi^2(3) = 3.35 )</td>
<td>( \chi^2(1) = 4.51^{**} )</td>
</tr>
<tr>
<td>Any doctor visit</td>
<td>( F(4, 41971) = 669.63^{***} )</td>
<td>( \chi^2(3) = 1.11 )</td>
<td>( \chi^2(1) = 3.17^{*} )</td>
</tr>
<tr>
<td>( \ln(\text{# doctor visits}) )</td>
<td>( F(4, 32902) = 560.77^{***} )</td>
<td>( \chi^2(3) = 0.16 )</td>
<td>( \chi^2(1) = 13.20^{***} )</td>
</tr>
<tr>
<td>Any GP visit</td>
<td>( F(4, 41715) = 666.09^{***} )</td>
<td>( \chi^2(3) = 1.20 )</td>
<td>( \chi^2(1) = 0.06 )</td>
</tr>
<tr>
<td>( \ln(\text{# GP visits}) )</td>
<td>( F(4, 26127) = 424.95^{***} )</td>
<td>( \chi^2(3) = 1.19 )</td>
<td>( \chi^2(1) = 4.09^{**} )</td>
</tr>
<tr>
<td>Any specialist visit</td>
<td>( F(4, 41136) = 632.68^{***} )</td>
<td>( \chi^2(3) = 1.27 )</td>
<td>( \chi^2(1) = 2.41 )</td>
</tr>
<tr>
<td>( \ln(\text{# specialist visits}) )</td>
<td>( F(4, 13389) = 298.37^{***} )</td>
<td>( \chi^2(3) = 0.87 )</td>
<td>( \chi^2(1) = 1.62 )</td>
</tr>
</tbody>
</table>

\( ^* p < 0.10, \quad ^{**} p < 0.05, \quad ^{***} p < 0.01 \)

Table 4: Instrument strength, overidentifying restrictions and exogeneity tests: medically-versus non-medically-related HC

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Instruments strength(^a) ( F(4, ____) = ___.__ )</th>
<th>Overidentifying restrictions ( \chi^2(2) = ___.__ )</th>
<th>Exogeneity ( \chi^2(2) = ___.__ )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any hospitalization</td>
<td>( F(4, 42530) = 940.75^{***} )</td>
<td>( \chi^2(2) = 3.26 )</td>
<td>( \chi^2(2) = 1.68 )</td>
</tr>
<tr>
<td>( \ln(\text{LOS}) )</td>
<td>( F(4, 5252) = 103.91^{***} )</td>
<td>( \chi^2(2) = 0.03 )</td>
<td>( \chi^2(2) = 3.84 )</td>
</tr>
<tr>
<td>Any doctor visit</td>
<td>( F(4, 41971) = 936.98^{***} )</td>
<td>( \chi^2(2) = 0.23 )</td>
<td>( \chi^2(2) = 3.50 )</td>
</tr>
<tr>
<td>( \ln(\text{# doctor visits}) )</td>
<td>( F(4, 32902) = 764.96^{***} )</td>
<td>( \chi^2(2) = 0.18 )</td>
<td>( \chi^2(2) = 12.51^{***} )</td>
</tr>
<tr>
<td>Any GP visit</td>
<td>( F(4, 41715) = 932.16^{***} )</td>
<td>( \chi^2(2) = 0.99 )</td>
<td>( \chi^2(2) = 0.10 )</td>
</tr>
<tr>
<td>( \ln(\text{# GP visits}) )</td>
<td>( F(4, 26127) = 563.14^{***} )</td>
<td>( \chi^2(2) = 1.05 )</td>
<td>( \chi^2(2) = 4.95^{*} )</td>
</tr>
<tr>
<td>Any specialist visit</td>
<td>( F(4, 41136) = 868.19^{***} )</td>
<td>( \chi^2(2) = 0.49 )</td>
<td>( \chi^2(2) = 2.50 )</td>
</tr>
<tr>
<td>( \ln(\text{# specialist visits}) )</td>
<td>( F(4, 13389) = 408.75^{***} )</td>
<td>( \chi^2(2) = 0.25 )</td>
<td>( \chi^2(2) = 1.14 )</td>
</tr>
</tbody>
</table>

\( ^* p < 0.10, \quad ^{**} p < 0.05, \quad ^{***} p < 0.01 \)

\(^a\) Top row: Medically-related HC hours equation;
Bottom row: Non-medically-related HC hours equation.
Table 5: Effect of HCP generosity on acute care use: medically- versus non-medically-related HC

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Probit/OLS</th>
<th>IV probit/2SLS</th>
<th>Exogeneity rejected?a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MR HC</td>
<td>NMR HC</td>
<td>MR HC</td>
</tr>
<tr>
<td>Hospitalizations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any hospitalization</td>
<td>0.0182</td>
<td>-0.0581</td>
<td>0.114</td>
</tr>
<tr>
<td>Ln(LOS)</td>
<td>-0.167**</td>
<td>0.436***</td>
<td>-0.473***</td>
</tr>
<tr>
<td>Doctor visits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any doctor visit</td>
<td>0.00988</td>
<td>-0.0607</td>
<td>-0.0897</td>
</tr>
<tr>
<td>Ln(# doctor visits)</td>
<td>0.0194</td>
<td>-0.157***</td>
<td>0.127**</td>
</tr>
<tr>
<td>Any GP visit</td>
<td>0.0199</td>
<td>-0.0853</td>
<td>-0.00255</td>
</tr>
<tr>
<td>Ln(# GP visits)</td>
<td>-0.0261</td>
<td>-0.0508</td>
<td>0.0474</td>
</tr>
<tr>
<td>Any specialist visit</td>
<td>-0.00388</td>
<td>-0.0994</td>
<td>0.112</td>
</tr>
<tr>
<td>Ln(# specialist visits)</td>
<td>0.0670*</td>
<td>-0.134</td>
<td>0.131</td>
</tr>
</tbody>
</table>

MR HC = ln(medically-related HC hours per capita)
NMR HC = ln(non-medically-related HC hours per capita)

Standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

* p < 0.10
Appendix


<table>
<thead>
<tr>
<th>Variable</th>
<th>Full sample (n=42,588)</th>
<th>Positive LOS (n=5,310)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. dev.</td>
</tr>
<tr>
<td>Availability of informal care</td>
<td>0.68</td>
<td>0.47</td>
</tr>
<tr>
<td>No informal care available(^a)</td>
<td>0.32</td>
<td>0.47</td>
</tr>
<tr>
<td>Good health(^a)</td>
<td>0.85</td>
<td>0.36</td>
</tr>
<tr>
<td>Fair health</td>
<td>0.12</td>
<td>0.32</td>
</tr>
<tr>
<td>Poor health</td>
<td>0.03</td>
<td>0.18</td>
</tr>
<tr>
<td>Few physical troubles(^a)</td>
<td>0.31</td>
<td>0.46</td>
</tr>
<tr>
<td>Some physical troubles</td>
<td>0.35</td>
<td>0.48</td>
</tr>
<tr>
<td>Many physical troubles</td>
<td>0.34</td>
<td>0.47</td>
</tr>
<tr>
<td>No ADL limitations(^a)</td>
<td>0.99</td>
<td>0.11</td>
</tr>
<tr>
<td>ADL limitations</td>
<td>0.01</td>
<td>0.11</td>
</tr>
<tr>
<td>Able to walk 200m(^a)</td>
<td>0.98</td>
<td>0.15</td>
</tr>
<tr>
<td>Not able to walk 200m</td>
<td>0.02</td>
<td>0.15</td>
</tr>
<tr>
<td>Not obese(^a)</td>
<td>0.92</td>
<td>0.27</td>
</tr>
<tr>
<td>Obese</td>
<td>0.08</td>
<td>0.27</td>
</tr>
<tr>
<td>Non-smoker(^a)</td>
<td>0.48</td>
<td>0.50</td>
</tr>
<tr>
<td>Current or ex-smoker</td>
<td>0.52</td>
<td>0.50</td>
</tr>
<tr>
<td>Moderate alcohol consumption(^a)</td>
<td>0.79</td>
<td>0.41</td>
</tr>
<tr>
<td>Excessive alcohol consumption</td>
<td>0.21</td>
<td>0.41</td>
</tr>
<tr>
<td>Age(^b)</td>
<td>49.61</td>
<td>16.79</td>
</tr>
<tr>
<td>[20; 99]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woman 20-39</td>
<td>0.18</td>
<td>0.38</td>
</tr>
<tr>
<td>Woman 40-64</td>
<td>0.23</td>
<td>0.42</td>
</tr>
<tr>
<td>Woman 65+</td>
<td>0.13</td>
<td>0.34</td>
</tr>
<tr>
<td>Man 20-39(^a)</td>
<td>0.16</td>
<td>0.37</td>
</tr>
<tr>
<td>Man 40-64</td>
<td>0.21</td>
<td>0.41</td>
</tr>
<tr>
<td>Man 65+</td>
<td>0.09</td>
<td>0.29</td>
</tr>
<tr>
<td>Swiss</td>
<td>0.88</td>
<td>0.33</td>
</tr>
<tr>
<td>Not Swiss(^a)</td>
<td>0.12</td>
<td>0.33</td>
</tr>
<tr>
<td>Rural area</td>
<td>0.14</td>
<td>0.35</td>
</tr>
<tr>
<td>Urban area(^a)</td>
<td>0.86</td>
<td>0.35</td>
</tr>
<tr>
<td>Primary education(^a)</td>
<td>0.14</td>
<td>0.34</td>
</tr>
<tr>
<td>Secondary education</td>
<td>0.64</td>
<td>0.48</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>0.22</td>
<td>0.41</td>
</tr>
<tr>
<td>Ind-equiv hh inc in 10k(^b)</td>
<td>5.11</td>
<td>3.05</td>
</tr>
<tr>
<td>[0.60; 96]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage: shared hospital room(^a)</td>
<td>0.64</td>
<td>0.48</td>
</tr>
<tr>
<td>Coverage: shared room w/ choice of hospital</td>
<td>0.25</td>
<td>0.43</td>
</tr>
<tr>
<td>Coverage: (semi-)private room</td>
<td>0.11</td>
<td>0.31</td>
</tr>
<tr>
<td>Woman without a child &lt;15(^a)</td>
<td>0.87</td>
<td>0.34</td>
</tr>
<tr>
<td>Woman with at least one child &lt;15</td>
<td>0.13</td>
<td>0.34</td>
</tr>
<tr>
<td>Man without a child &lt;15(^a)</td>
<td>0.88</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Continued on next page...
table 6 continued

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. dev.</th>
<th>Mean</th>
<th>Std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man with at least one child &lt;15</td>
<td>0.12</td>
<td>0.32</td>
<td>0.07</td>
<td>0.26</td>
</tr>
<tr>
<td>No job(^a)</td>
<td>0.37</td>
<td>0.48</td>
<td>0.53</td>
<td>0.50</td>
</tr>
<tr>
<td>Part-time job</td>
<td>0.22</td>
<td>0.41</td>
<td>0.19</td>
<td>0.40</td>
</tr>
<tr>
<td>Full-time job</td>
<td>0.42</td>
<td>0.49</td>
<td>0.28</td>
<td>0.45</td>
</tr>
</tbody>
</table>

\(^a\)Categorical variable: reference category.

\(^b\)Continuous variable: minimum and maximum values in parenthesis.

The sample is that of the hospitalizations 2PM.
Figure 1: Number of hospital beds per capita by canton, 1997-2007

Figure 2: Number of doctors per capita by canton, 1997-2007