# Does health insurance encourage the rise in medical prices?

## A test on balance billing in France *

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**Abstract**

We evaluate the causal impact of an improvement in insurance coverage on patients' decisions to consult physicians who charge more than the regulated fee. We use a French panel data set of 43,111 individuals observed from 2010 to 2012. At the beginning of the period, none of them were covered for balance billing; by the end, 3,819 had switched to supplementary insurance contracts that cover balance billing. Using instrumental variables to deal with possible non exogeneity of the decision to switch, we find evidence that better coverage increases demand for specialists who charge high fees, thereby contributing to the rise in medical prices. People whose coverage improves increased their average amount of balance billing per consultation by 32%. However, the impact of the coverage shock depends on the supply of physicians. For people residing in areas where few specialists charge the regulated fee, better coverage increases not only prices, but also the number of consultations, a finding that suggests that balance billing might limit access to care. Conversely, in areas where patients have a genuine choice between specialists who balance bill and those who do not, we find no evidence of a response to better coverage.

*JEL classification*: I13; I18; C23

*Keywords*: Health insurance; Balance billing; Health care access

*We thank for their helpful comments Thomas Buchmueller (University of Michigan), Clémentine Garrouste (Université Paris Dauphine), Nicolas Jacquemet (Université de Lorraine), Glenn Jones (University of Technology Sidney) and Thomas Mason (University of Manchester). We also thank participants at the 24th European workshop on Econometrics and Health Economics (Paris 2015); participants at the 6th Australasian workshop on Econometrics and Health Economics (Melbourne 2015); participants at the 13th Journées Maurice Marchand (Toulouse 2014); participants at the 1st EuHEA PhD Students Conference (Manchester 2014); and participants at the 10th IHEA Congress in Health Economics (Dublin 2014). We gratefully acknowledge financial supports from the Health Chair - a joint initiative by PSL, Université Paris Dauphine, ENSAE, MGEN and ISTYA under the aegis of the Fondation du Risque (FDR).

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# 1 Introduction

Designed to favour access to care for all, social health insurance is widespread in the European Union and most developed countries. Many debates have focused on the ability of health care systems to contain health expenditure growth, but little attention has been devoted to the fact that effectiveness of coverage depends on the regulator's ability to control medical prices. For ambulatory care, national health insurance (NHI) systems usually set prices or sign agreements with physicians that set a regulated fee, which is the basis for NHI reimbursement. Nevertheless, physicians can sometimes balance bill their patients, i.e. charge them more than the regulated fee.[1] Since balance billing can generate high out-of-pocket expenditures, patients often purchase supplementary health insurance (SHI) to cover this financial risk. However, generous health insurance coverage can cause welfare loss, not only because it might favour excessive consumption of care, but also because health care providers can increase their prices (Pauly (1968), Feldstein (1970), Feldman and Dowd (1991)). Hence, comprehensive coverage might encourage demand for expensive physicians, resulting in an increase in balance billing. This increase leads to a rise in SHI premiums, and jeopardizes coverage for patients who are covered by national health insurance alone.

The aim of this paper is to measure the causal impact of a positive shock on supplementary health insurance coverage on recourse to physicians who balance bill. The econometric analysis is performed on a French database of 43,111 individuals observed between 2010 and 2012 and covers specialist consultations in ambulatory care. In addition to measuring the impact of insurance coverage on balance billing, we address two related issues: the influence of supply organization on balance billing (i.e. ease of access to physicians who do not balance bill), and the possible impact of balance billing on access to care.

Balance billing became a political issue in the United States in the late 1980s. Physicians were allowed to charge Medicare patients more than the copayment set by Medicare, the social health insurance system for people aged 65 or more. In 1984, balance billing amounted to 27% of total out-of-pocket payments charged to Medicare beneficiaries for physician consultations. Concerns about possible degradation of health care coverage led several states to restrict balance billing, and the federal government followed suit. The Omnibus Budget Reconciliation Act of 1989 restricted balance billing. It was eventually limited to a maximum of 9.25% of the Medicare fee in 1993 (see

[1] The terms "extra billing" or "*dépassements d'honoraires*" (in French) can also be found in the literature

McKnight (2007) for a full description of Medicare's balance billing reform). Balance billing for physician visits and hospital stays also exists in Canada, Australia, France and Belgium (see Epp et al. (2000), Gravelle et al. (2013), Lecluyse et al. (2009)).

In France, a large proportion of specialists are allowed to balance bill their patients. The population is covered by mandatory National Health Insurance (NHI) and for each service provided, a reference fee is set by agreement between physicians and the health insurance administration. NHI covers 70% of the reference fee for ambulatory care. Individuals can take out supplementary private insurance: either voluntarily on an individual basis, or through occupational group contracts. Currently, 95% of the French population is covered by supplementary health insurance (SHI). Supplementary insurance contracts cover the 30% of ambulatory care expenses not covered by National Health Insurance. In addition, they can offer coverage for balance billing.

Concern about balance billing is mounting in France because it has doubled over the last 15 years and now represents 2.3 billions euros. This expansion is due to an increase in both the average amount of balance billing (which rose by an average 1.7% per year between 2004 and 2011) and the share of doctors (mostly specialists) who balance bill their patients. For policy makers, balance billing has the advantage of permitting an increase in physicians' earnings with no additional burden on social health insurance. However, it raises out-of-pocket payments and might lead to a two-tier health care system where only rich people can afford to see certain doctors. Moreover, the last ten years have been marked by continuous extension of balance billing coverage by supplementary insurers, together with a continuous increase in the amount of balance billing. This suggests that coverage encourages balance billing. In keeping with this idea, the French government has recently introduced tax reductions for insurers who offer contracts that limit coverage of balance billing.

Balance billing in the context of social health insurance raises several policy questions. Should it be forbidden? Should it be restricted, as for Medicare patients in the USA? Should coverage of balance billing be discouraged as in France? On the contrary, should the government favor balance billing to promote better care quality? Or should the government only monitor the supply of care, to ensure that all patients have a genuine choice, i.e. effective access to physicians who do not balance bill?

In this paper, we evaluate the impact on patient behavior of a shock consisting of better coverage of balance billing, while controlling for supply side drivers. In our framework, the impact of coverage

on health care use depends both on patients' beliefs regarding the quality of care provided by physicians who balance bill, and on access to physicians who do not balance bill. Focusing on balance billing enables us to study the impact of insurance coverage (moral hazard) on two dimensions of care use: quality and quantity.

Our database stems from administrative data provided by the Mutuelle Générale de l'Education Nationale (MGEN). We use a panel dataset of 43,111 individuals observed between January 2010 and December 2012, which provides individual information on health care claims and reimbursements provided by national and supplementary health insurance. Our data makes it possible to observe enrollees when they are all covered by the same supplementary insurer (MGEN-SHI), which does not cover balance billing, and after some of them switched to other supplementary insurers which do cover balance billing. So, we have at our disposal a treatment group, the "switchers", and a control group, the "stayers", made up of those who did not leave MGEN supplementary insurance. Because the decision to switch to a more generous insurance coverage is likely to be non exogenous, we introduce individual fixed effects into the specifications and use instrumental variables for the estimations.

On the whole sample, we find that better coverage leads individuals to raise their proportion of consultations of specialists who balance bill by 9%, resulting in a 32% increase in the amount of balance billing per consultation. However, the impact of the coverage shock depends on local availability of physicians who charge the regulated fee, measured by the local specialist:population ratio for these physicians. We find that a coverage shock has no significant effect on recourse to expensive physicians or on the amount of balance billing when physicians who charge the regulated fee are readily accessible. On the contrary, when physicians who charge the regulated fee are scarce, a coverage shock has a strong impact: individuals raise their proportion of consultations of specialists who balance bill by 14%, resulting in a 47% rise in the amount of balance billing per consultation; in addition, there is evidence of limits in access to care for a sizeable minority of individuals in this situation (30% of the sample).

To sum up, we find evidence of a moral hazard effect on quality of care: an increase in the proportion of consultations of specialists who balance bill. In addition, we find for some individuals a moral hazard effect on quantity of care: better coverage leads them to increase their number of consultations of specialists, which suggests that balance billing limited their access to specialists.

Another important result is the absence of impact of a coverage shock when physicians who charge the regulated fee are widely available, enabling people to choose between physicians who balance bill and physicians who do not. On the basis of these results, it seems that the most appropriate policy is not to limit insurance coverage but to monitor the supply of care in order to guarantee patients a genuine choice of their physicians.

This paper is organized as follows. Section 2 summarizes the related literature. Section 3 describes French regulation of ambulatory care, and formalizes patients' decisions to consult a physician who balance bill in the French context. In section 4, we present our data and empirical strategy. Econometric specification and estimation are presented in section 5. Results and robustness checks are presented in section 6 and section 7 concludes.

## 2 Insurance coverage, medical prices and balance billing: results from the literature

The literature devoted to the impact of health insurance on the market for health care can shed light on the question of the impact of health insurance on balance billing. If more insurance raises demand, this should increase medical prices. Papers studying the influence of health insurance on suppliers' medical pricing date from the 1970s. According to Feldstein (1970, 1973) physicians respond to health insurance coverage by increasing their fees. Using US data, Sloan (1982) showed that a 1$ increase in health insurance coverage results in a 13 to 35 cents increase in physicians' fees. These results are in line with theoretical predictions (see for instance Chiu (1997) and Vaithianathan (2006)). On the demand side, moral hazard depends on the sensitivity of demand to prices (Einav et al. (2013)): assuming a negative price-elasticity of demand, better coverage leads to an increase in health care use. However, as pointed out by Phelps and Newhouse (1974), the impact of insurance coverage on demand for health care may depend significantly on time costs associated to access to a doctor, such as travel time or queues in the office. Demand for goods with relatively low time costs is likely to be more sensitive to a change in health insurance coverage.

What is the impact of balance billing on social welfare? After restrictions on balance billing were enacted in the USA, several theoretical papers attempted to predict the effects of this reform on social welfare. Papers by Paringer (1980), Mitchell and Cromwell (1982) and Zuckerman and

Holahan (1989) assume that physicians face a downward-sloping demand curve and do not differ in the quality of care they provide but are able to price discriminate their patients. If physicians agree to treat patients who pay only the regulated fee, social welfare is unchanged: balance billing results in a transfer of surplus from patients with a high willingness to pay to physicians. More recent papers assume that physicians are not homogeneous and discriminate between patients in price and quality of care (Glazer and McGuire (1993); Kifmann and Scheuer (2011)). These authors conclude that balance billing improves welfare because quality is higher for both regulated-fee and balance-billed patients. A key assumption is that physicians have perfect information about patients' willingness to pay and are able to price discriminate perfectly. Jelovac (2013) points out that this assumption is unrealistic. She assumes that physicians do not have perfect information about patients' ability to pay. On this basis, she finds that balance billing can reduce access to care and therefore decrease social welfare.

Empirical evidence on limits to access to health care due to balance billing is rather scarce and inconclusive. Using US data, McKnight (2007) finds that restrictions imposed on balance billing reduced out-of-pocket payments by 9%. However, she does not find any evidence of an increase in health care use, which supports the idea that balance billing acts solely as a mechanism of surplus extraction without hindering access to care. On the other hand, a descriptive analysis of French data indicates that health care use is reduced in regions where balance billing is widespread (Desprès et al. (2011)).

## 3 French regulation of ambulatory care and balance billing

In France, ambulatory care is mostly provided by self-employed physicians paid on a fee-for-service basis. Since 1980, physicians can choose between two contractual arrangements with the regulator. If they join "Sector 1", physicians are not permitted to balance bill. They agree to charge their patients the reference fee (23€ (or 25€) in 2012 for a routine visit to a generalist (or a specialist)), and get tax deductions in return. If they join "Sector 2", they are allowed to set their own fees. Access to Sector 2 has been closed to most GPs since 1990, so most of them are in Sector 1: 87% in 2012. Hence balance billing concerns mostly specialists. On average, balance billing adds 35% to the annual earnings of Sector 2 specialists. In 2012, 42% of specialists were in Sector 2.

However, this proportion varies greatly across regions and specialties: for instance, the proportion of specialists in Sector 2 is 19% for cardiologists, 73% for surgeons and 53% for ophthalmologists.

Patients' out-of-pocket payment for a consultation depends on the sector of the specialists they consult, and on their supplementary insurance coverage. Coverage of balance billing varies between SHI contracts: statistics are not complete but 52% of individual SHI subscribers are not covered for balance billing; in polls, 48.5% of all SHI subscribers - both individual and occupational group subscribers - state that they are well covered for balance billing (Celant et al. (2014)).

### 3.1 The decision to consult a Sector 2 specialist

Sector 1 and Sector 2 specialists are supposed to provide the same medical service and balance billing is supposed to amount to charging a higher price for the same thing. However, access to Sector 2 has been restricted since 1990 to physicians who practice in a qualifying hospital setting, which suggests that they have higher level of education and of skill. Apart from this, patients have no other information on differences in quality of care provided by physicians. In this context, a physician's choice to belong to Sector 2 can be seen as a signal about skill (Spence (1973)) and patients might prefer to consult a Sector 2 physician in order to have a better chance of getting high quality care (see also Batifoulier and Bien (2000)). Nevertheless, beyond the issue of care quality, other potential differences between Sector 1 and 2 specialists are observable: if there is a local shortage in Sector 1 specialists, consulting a Sector 1 specialist exposes the patient to search costs, waiting time and transportation costs, whereas Sector 2 specialists can be more readily accessible.[2]

Consider a utility maximizing patient who chooses the levels of consumption of non-medical goods ($z$) and of consultations of Sector 1 and Sector 2 specialists ($x_1$ and $x_2$) in order to maximize $U(z,\ h(x_1, x_2))$ under a budget constraint. $h$ is the level of the patient's health, given by a subjective health production function: $h = h_0 + g(x_1, x_2)$, where $h_0$ is the level of health without any specialist consultation. The ouput provided by $g(x_1, x_2)$ depends on a patient's beliefs regarding the productivity and quality of Sector 1 and Sector 2 specialists.

Consider $p$ the regulated fee and $bb$ the level of balance billing. As stated above, all supplementary insurance contracts cover the share of the regulated fee which is not covered by National Health

[2] A website of the National Health Insurance provides information on available specialists, if they belong to Sector 1 or 2, and indications of their fee level.

Insurance (NHI), i.e. 30 % for a consultation.[3] In addition, some SHI contracts cover balance billing. We denote $\gamma$ the rate of coverage by mandatory National Health Insurance (NHI), $c$ the minimal rate of coverage offered by all supplementary health insurers (copayment coverage), and $s$ the balance billing coverage offered by some SHI contracts. The cost of access to Sector 1 or 2 specialists is also influenced by their availability. We denote $d_1$ and $d_2$ search costs, as well as transportation and waiting time costs associated to access to a Sector 1 or a Sector 2 specialist. $d_1$ and $d_2$ are linked to local specialist:population ratios.

Hence, the total cost of a consultation of a Sector 1 specialist is: $p_1 = p(1-\gamma-c)+d_1$; and the total cost of a consultation of a Sector 2 specialist is: $p_2 = p(1-\gamma-c)+(bb-s)+d_2$. Given that all individuals in our sample are fully covered for copayments[4], $p(1-\gamma-c) \simeq 0$. The relative price of a Sector 2 consultation is given by[5]:

$$\frac{p_2}{p_1} = \frac{(bb-s)+d_2}{d_1} \tag{1}$$

Given this formalization, the decision to consult a Sector 2 specialist is based on cost minimization for a given level of health production $g(x_1, x_2) = h - h_0$. If the patient believes that consultations of a Sector 1 and Sector 2 physician are not perfectly substitutable, the isoquants of the health production function are not linear. Given that the iso-cost lines have a slope equal to the relative price $\frac{p_2}{p_1}$, an increase in balance billing coverage (say, from $s = 0$ to $s > 0$) induces an increase in the use of Sector 2 physicians. The magnitude of the impact depends on the availability of Sector 1 physicians. Indeed, the variation of the relative price with respect to $s$ is $\frac{\partial \frac{p_2}{p_1}}{\partial s} = -\frac{1}{d_1}$.

Note that when Sector 2 physicians are very scarce, $\frac{p_2}{p_1} \to \infty$ whatever the value of $s$: in this situation, a change in SHI coverage should have no effect on recourse to Sector 2 physicians. Another specific case is when the patient believes that Sector 1 and Sector 2 physicians are perfectly substitutable: this leads to corner equilibria, with only Sector 1 or only Sector 2 consultations, depending on the value of $\frac{p_2}{p_1}$ and on $g(.)$ parametrization.

[3] In France SHI contracts are allowed to cover copayments, except for a negligible copay of 1 euro per consultation which was introduced in 2004.

[4] Except for the negligible 1 euro copay.

[5] Given that most contracts impose a ceiling on balance billing coverage, $s$ is not a coverage rate (it is fixed and not proportional to balance billing), but this does not affect the model's predictions.

### 3.2 Availability of Sector 1 and Sector 2 specialists

As stated above, supply organization can influence recourse to Sector 2 specialists. Figure 1 provides geographical information about the specialist:population ratio of Sector 1 and Sector 2 specialists for the 95 *départements* of continental France. The specialist:population ratio is an indicator of physicians' availability, i.e. search, transportation and waiting time costs associated to access to a Sector 1 or a Sector 2 specialist. Medical density is used here as an indicator of distance (in the geographical and time sense) to the doctor. We are not interested in using a concentration index for comparing market power of Sector 1 versus Sector 2 specialists because what is important in our analysis is to measure the distance for patients to any single doctor of each type. Of course the specialist:population ratio is an imperfect indicator because there are border effects and geographical areas do not coincide with practice areas.

Figure 1 shows that there is not always an inverse relation between specialist:population ratios for Sector 1 specialists and Sector 2 specialists: on the Mediterranean cost, both types of specialists are numerous. Conversely, in Brittany (the North-West of France), there are many Sector 1 specialists and very few Sector 2 specialists. The Parisian region, on the other hand, has many Sector 2 specialists and very few Sector 1 specialists. Figure 2 gives the proportion of Sector 2 specialist consultations and average balance billing per consultation for each *département*, as computed on our sample. The comparison with Figure 1 suggests a strong impact of supply side drivers on both propensity to see a Sector 2 specialist and the amount of balance billing.

## 4 Data and empirical strategy

We use a panel data set from a French supplementary insurer: *Mutuelle Générale de l'Education Nationale* (MGEN). For historical reasons, MGEN processes claims from national health insurance in addition to offering supplementary insurance (MGEN-SHI). Our data stemmed from administrative MGENdata: they provide, for each policyholder, detailed information about medical bills and reimbursements for both national and supplementary insurance.

MGEN is a *mutuelle*, i.e. a non profit insurer which administrates mandatory health insurance for teachers and ministry of education employees. Most of them are civil servants. MGEN also supplies supplementary health insurance in the form of a single contract which offers minimal

coverage: it covers copayments but not balance billing. The premium is defined as a proportion of wages for working members and of pensions for retirees. People subscribe to this supplementary insurance on a voluntary basis. The fact that its premiums are proportional to wages gives MGEN an odd position in the SHI market. Most supplementary insurers charge a premium that does not depend on wage or income. In the short term, young, healthy and wealthy teachers should be better off purchasing coverage with a premium that depends on age. However, the MGEN-SHI contract becomes more valuable as individuals grow older. In order to avoid free riding, MGEN-SHI penalizes late entry and does not allow members who leave to return later on. Currently, MGEN processes NHI claims for 3.3 million individuals (all teachers and ministry of education employees, their families and pensioners). Among them, 2.3 million subscribe to the MGEN-SHI contract.

### 4.1 Empirical strategy

Our empirical strategy is based on MGEN-SHI enrollees who switched to other supplementary insurers during our observation period. Since MGEN-SHI covers only copayments, that is, the minimal coverage offered by supplementary health insurers, we can assume that this switch entails equal or better coverage.

From the MGEN database, we built two samples over the period 2010-2012: one with 87,291 "stayers", the other one with 7,940 "switchers". The former remained MGEN-SHI enrollees over the observation period (2010-2012), the latter were MGEN-SHI subscribers in January 2010, but terminated their contracts in 2011. Because MGEN still processes their NHI claims in 2012, we observe their health expenditures over the whole period. Switchers' decision to leave in 2011 creates a positive shock on their insurance coverage. Therefore, we can use Stayers and Switchers as control and treatment groups (see Figure 3).

We do not observe switchers' coverage for balance billing after they have left MGEN-SHI. However, since MGEN-SHI coverage of balance billing is zero, we know that their new coverage will be at least as good as, and probably better than the MGEN-SHI coverage. Hence our estimated impacts should be interpreted as "intent-to-treat" (ITT) effects. These are likely to understate the real impact of better insurance coverage and should be interpreted as lower-bounds.

The original sample was composed of 91,629 stayers and 8,249 switchers. For the purpose of the study, we decided to over-represent switchers: in our data the proportion of switchers is

not representative of the actual switching rate of 0.5%. We excluded the people who live outside continental France (territories such as Guadeloupe, Martinique, etc.) and the top 1% of care users in 2010 or 2012 (more than 28 consultations a year for stayers, 30 for switchers). As stated above, balance billing is not an issue for GPs, so we focus on specialists. More precisely, we measure the effect of insurance coverage on the decision to visit a specialist who balance bills, conditional on consulting a specialist. Therefore, we restricted the sample to individuals who consulted a specialist at least once in 2010 and in 2012 (spe=1). They represent 45% of stayers and 48% of switchers. To sum up we use a sample of 43,111 individuals: 39,292 are stayers and 3,819 switchers; they are observed from 2010 to 2012 and consulted a specialist at least once in 2010 and in 2012.

### 4.2 Variables

Our data provide information at the individual level about the total number of specialist consultations (denoted $Q$), the number of consultations of Sector 2 specialists ($Q2$) and the total amount of balance billing ($BB$). Our variables of interest are the number of specialist consultations $Q$, the proportion of consultations of Sector 2 specialists $Q2/Q$, average balance billing per consultation $BB/Q$ and average balance billing per Sector 2 consultation $BB/Q2$ (the last indicator is computed for individuals with at least one visit to a Sector 2 specialist (Spe2=1)).

Using these four indicators allows us to distinguish between patients' use of specialists, patients' decisions to consult a Sector 2 specialist, and the amount of balance billing. Of course, the average amount of balance billing per Sector 1 or 2 consultation ($BB/Q$) is influenced both by the proportion of Sector 2 consultations and, on the supply side, by $BB/Q2$ the prices set by Sector 2 specialists.

At the individual level, we can only compute average balance billing. Indeed, our data provides information on the number of consultations for each specialty in Sector 1 and Sector 2 but not on the fee associated to each consultation. However, we can take advantage of the specialties needed by patients to control for the extent of their choice of Sector 1 or 2 specialists. In France, gynecologists, ophthalmologists, surgeons and ENT[6] specialists balance bill in a much larger proportion than their colleagues. As a result, it is more difficult to avoid a Sector 2 physician for a patient who needs to consult one of these types of specialists, inducing more balance billing per consultation. To deal with this heterogeneity, we introduce a dummy variable for "expensive physicians" ($Exp.Phy$),

[6]Ear, nose and throat specialists.

which is equal to 1 when the individual sees at least one of these specialists.

Demand characteristics include gender, age, income and health status. Our income variable is based on the individual's wage. It is computed using the fact that MGEN-SHI premiums are proportional to individuals' wages. Because premiums are limited by lower and upper bounds for monthly wages lower than 1,000€and higher than 4,900€, this proxy is close to a truncated individual wage. As concerns health status, we know if the patient has a chronic disease ($CD = 1$). Supply side characteristics include visits to a GP, specialist:population ratios and the $Exp.Phy$ dummy variable. In France, one can consult a specialist without seeing a GP beforehand. Patients do not need their GP's agreement to consult gynecologists or ophthalmologists. For other specialties, GPs are gatekeepers and their consent determines the extent of national health insurance reimbursement.[7] We control for this arrangement with a dummy indicating that the patient consulted a GP at least once in the current year. Supply side organization is taken into account using information provided by the NHI[8] about specialist:population ratios at the *département* level in Sector 1 (SPR1) and 2 (SPR2). We introduce an interaction between Sector 1 and 2 specialist:population ratios to allow for non linear effects.

### 4.3 Basic features of the data

Since MGEN enrollees are mostly teachers, the sample is not representative of the French population (see Table I). There are many women (65%), their average age is 55, and the average monthly wage is 2434€, which is higher than the average wage in France. We warn against generalizing our results to different settings, because we are dealing with a population which is likely to have specific habits concerning health, specific values and a particular degree of risk aversion.

Most studies of competition in health insurance find a higher propensity of young, healthy and highly educated individuals to switch companies (Dormont et al. (2009)). We find the same characteristics for people who decided to leave MGEN-SHI: they are much younger (42.5 versus 55.4) and healthier than stayers (only 6.8% have a chronic disease, versus 17.5%). However, our switchers have a lower income than stayers. This is due to the fact that wage variability is reduced for teachers in comparison with the whole population; moreover, teachers' wages are strongly correlated with

[7] Reimbursements are reduced in case of recourse to a specialist without a GP's referral and incentives are given to SHI to not cover this penalty.

[8] *SNIR (Syndicat National Inter Régimes),* provided by *CNAMTS (Caisse Nationale d'Assurance Maladie des Travailleurs Salariés)*

age because promotions are mostly based on seniority. Here, switchers have a lower income because they are thirteen years younger than stayers on average.

Table II displays statistics about recourse to specialists, proportion of Sector 2 consultations and amount of balance billing for stayers and switchers in 2010, when both groups had no coverage for balance billing. These statistics depict heterogeneity in preferences and situations for individuals with the same coverage. On average, stayers and switchers consulted specialists respectively 3 and 3.2 times in 2010. The proportion of Sector 2 consultations is significantly higher for switchers than for stayers: 51.6% versus 44.6%. As a result, switchers pay significantly more balance billing in total (41€ versus 30€) and per consultation (12.8€ versus 10.2€). So, even when they had no coverage for balance billing, switchers consulted Sector 2 specialists more often and paid more balance billing than stayers.

The second column of Table II gives the mean and standard deviations for observations that are higher than the 99 percentile (average of the top 1%) for each indicator. The top 1% average values of balance billing shows that, even with a SHI contract, individuals are not protected against high out-of-pocket expenditures: 433€ per year for stayers and 505€ per year for switchers.[9]

The two last columns of Table II display mean and standard deviations computed for individuals living in areas characterized by low or high levels of Sector 2 specialist:population ratio. We find a strong influence of supply side organization: differences between stayers and switchers are significant only in places with many Sector 2 specialists (last column).

## 5 Econometric specification and estimation

The causal impact of a positive coverage shock on our variables of interest can be identified by estimating a model with individual fixed effects on the panel obtained by pooling years 2010 and 2012. To compare switchers and stayers, we include in the regressors a dummy variable named $QUIT$ which represents leaving MGEN-SHI in 2011 ($QUIT = 1$ for Switchers in 2012, $= 0$ in 2010). We also include a dummy variable for the year 2012 ($I_{2012} = 1$ for $t = 2012$, $I_{2012} = 0$ for $t = 2010$) to allow for a possible trend that would induce changes in behavior for both switchers and stayers.

[9] This is especially true because these figures are computed on a sample where the top 1% of care users have already been excluded: on the whole sample, we find average annual balance billing for the top 1% of care users equal to 638€ for stayers and 914€ for switchers.

We also control for time varying demand and supply variables denoted $X_{it}$ and $S_{it}$. Vector $X_{it}$ includes variables recorded at the individual level: income, chronic disease and GP consultation. $S_{it}$ is a vector of regressors relative to supply organization: specialist:population ratios for Sector 1 and Sector 2 in the *département* where the patient lives, and the dummy variable indicating the patient's need for expensive physicians $Exp.Phy$.

$$Y_{it} = \beta_0 + \tau QUIT_{it} + \lambda I_{2012,t} + \beta_1 X_{it} + \beta_2 S_{it} + \alpha_i + \epsilon_{it}, \quad t = 2010, 2012 \quad , \tag{2}$$

$Y_{it}$ denotes the dependent variable, which is one of the four indicators of interest: $log(Q)$, $log(Q2/Q)$, $log(BB/Q)$ and $log(BB/Q2)$. We introduce individual fixed effects $\alpha_i$. The disturbance $\varepsilon_{it}$ is supposed to be iid $(0, \sigma_\varepsilon^2)$.

Specifying a fixed effect $\alpha_i$ allows for potential non exogeneity of the decision to leave MGEN-SHI if this decision were correlated with individual unobserved heterogeneity. These effects are likely to be connected to switchers' permanent belief in better quality of care in Sector 2, or specific tastes that would induce higher disutility of time consuming travel and search efforts. The decision to leave MGEN-SHI might also be induced by a transitory shock in health care needs (the onset of illness which we cannot observe perfectly, although we observe and control for the onset of chronic disease) or by an information shock that affects beliefs regarding quality of care in Sector 2. In this case, there is a correlation between $\epsilon_{it}$ and the decision to leave MGEN-SHI. For this reason, we have performed an instrumental variable estimation of equation (2), in order to obtain a consistent estimation of the causal impact of improved coverage on $Y_{it}$.

A reliable instrument must be correlated with the decision to leave MGEN-SHI ($QUIT$) and must not directly affect the dependent variable $Y_{it}$. We have at our disposal two variables that are good candidates to be relevant instruments, and appeared to be exogenous and well correlated with $QUIT$. We used the decision to retire in 2011 for people younger than 55 and a change of *département* of residence in 2011. The threshold chosen for retirement age refers to a specific right for public school teachers and other civil servants that allowed those who raised three or more children to retire before they were 55.[10] This right was revoked recently and eligible teachers had to use this opportunity before January 2012. This retirement policy change created an exogenous

[10]Civil servants who raised three children or more were eligible for early retirement if they had worked in the civil service at least 15 years.

shock that gives us a good instrument. As shown in Figure A1 (in the online appendix), a large number of teachers retired in 2011 before they were 55 (300 in our sample) and half of them decided to leave MGEN-SHI the same year. MGEN pricing rules raise premiums from 2.97% of wages before retirement to 3.56% of pensions after. This shock on premiums can encourage people to switch, irrespective of any shock on care needs or beliefs in the quality of care in Sector 2. We also use the decision to move from one *département* to another in 2011 as an instrument for the decision to leave MGEN-SHI.[11] Since MGEN has separate agencies in each *département*, MGEN-SHI policy holders who move to a new *département* face high administrative costs in order to transfer their records to a new agency. Individuals who hesitated to switch before moving because of switching costs, may decide to switch upon moving since they face administrative costs in any case.

Even though it was encouraged by an exogenous policy change, early retirement might be linked with a negative health shock. To address this concern, we checked that individuals who retired before 55 in 2011 were not different in 2010 from those who remained active, as regards chronic disease, GP and specialist consultations, as well as drug consumption (see Table AI in the online appendix). We also found that future movers were not different in 2010 from non-movers either. Another difficulty arises if exogenous incentives to switch because of early retirement or *département* change are concomitant with a health shock. To rule out this possible source of bias, we checked if our compliers experienced any shock in their number of GP consultations and drug consumption between 2010 and 2012. Indeed, since MGEN-SHI fully covers copayments for GP visits and drugs, a shock on SHI coverage together with no change in health care needs should induce no change in recourse to GPs or drug consumption. Results displayed in Table AII show that we have not found any significant change between 2010 and 2012 in use of GPs or drugs for switchers who moved or took early retirement. Conversely, a negative health shock should increase both GP visits and drug consumption. Hence the strong impact of the onset of a chronic disease on the number of GP consultations (+13%) and drugs consumption (+64%), see Table AII in the online appendix.

# 6 Results

Our results are displayed in Tables III and IV. Table III gives the estimates of the causal impact of better coverage on the four indicators $Y_{it}$. Table IV presents the estimations for the other

[11] In our sample, 1415 individuals decided to move from one département to another in 2011, of which 287 decided to leave MGEN-SHI the same year.

regressors and individual fixed effects.

Several tests support the consistency of our instrumental variable estimates. Sargan tests all lead to non rejection of instrument compatibility.[12] In addition, we examined whether our estimations could be subject to the weak instrument problem. For this purpose, we tested for the significance of the excluded instruments in first stage regressions. We found a large significance of the partial correlation between the excluded instrument and $QUIT$, with high F statistics (larger than 92, see Table AIII in the online appendix). Following Bound, Jaeger and Baker (1995), this suggests that we can rule out instrument weakness. We rely on IV results when Hausman tests lead to rejection of $QUIT$ exogeneity. Otherwise we can rely on OLS estimates, which are consistent with IV estimates when $QUIT$ is exogenous. All estimations include individual fixed effects.

### 6.1 The impact of better coverage on the use of Sector 2 specialists and balance billing

Table III provides the OLS and IV estimates of the impact $\tau$ of the coverage shock for the whole sample (1) and various sub-samples (2-4), on the use of specialists, the proportion of Sector 2 consultations and the amount of balance billing per consultation. For each sub-sample and each dependent variable we also provide the Hausman test p-value. As stated above, we control for unobservable individual heterogeneity and potential non-exogeneity of $QUIT$. Note that a more simple difference-in-differences approach comparing stayers and switchers in 2010 and 2012 led to results that were similar to our fixed effect OLS estimates.

For the whole sample (1), better coverage has no impact on the use of specialists ($log(Q)$) but increases the share of Sector 2 consultations by 9%, which results in a 32% increase in the amount of balance billing per consultation. Hence, because it raises demand for Sector 2 physicians, better coverage by supplementary health insurance is likely to encourage the rise in medical prices. However, we do not find a significant effect of better coverage on the price of Sector 2 consultations ($log(BB/Q2)$): patients who normally visit S2 specialists do not take advantage of their better coverage to see even more expensive physicians. This also suggests that physicians do not adjust their prices to their patients' coverage, at least in the short run.

[12] For dependent variables $log(Q)$, $log(Q2/Q)$, $log(BB/Q)$ and $log(BB/Q2)$, we obtain very small values for the Sargan statistic, with p-values that are equal, respectively, to 0.94, 0.85, 0.71 and 0.10. We obtain similar results when we split the sample into sub-samples relative to different levels of SPR1.

As concerns significant coefficients, we find 2SLS estimates that are larger than the OLS estimates (see, for instance, Table III, (1)). At first glance, it seems surprising to find a negative endogeneity bias, given that people presumably switch insurers to enjoy better coverage for balance billing. In fact, such a negative bias is quite possible: given that our specification allows for an individual fixed effect, the IV estimation mostly corrects bias due to transitory health shocks. These shocks can be positively or negatively correlated over time, but a negative correlation is more likely because the onset of a chronic disease is already captured through a dummy variable in the regressors. Let us take the example of a tibia fracture in 2010. The patient experiences many consultations with large balance billing and she decides to quit MGEN-SHI in 2011 to get better coverage. In 2012, her need for Sector 2 specialist consultations is lower because she has recovered (however, our IV estimates show that, for a given level of needs, she uses more Sector 2 specialists than before quitting, because of the improvement in coverage).[13]

### 6.2 The effect of supply side organization on the impact of better coverage

As shown in Figure 1, local availability of Sector 1 specialists varies dramatically across geographical areas (*départements*). This is likely to induce heterogeneity in the impact $\tau$ of better coverage because the relative price of a Sector 2 consultation is not only influenced by balance billing coverage $s$, but also by search and transportation costs $d_1$ and $d_2$ to reach a Sector 1 or 2 specialist. Since $\frac{p_2}{p_1} = \frac{(bb-s)+d_2}{d_1}$, one has $\frac{\partial \frac{p_2}{p_1}}{\partial s} = -\frac{1}{d_1}$, suggesting that the impact of a coverage shock depends on the availability of Sector 1 specialists. Precisely, assuming that search costs, transportation costs and waiting time decrease with the number of Sector 1 specialists, the impact of insurance coverage should be higher in regions where the number of Sector 1 specialists is relatively low.

[13] A simple model enables us to compute the bias. For individual $i$, denoting the year by $t = 10, 11$ or 12, we have:
$bb_{i,10} = v_i$
$quit_{i,11} = a\ bb_{i,10} + u_i + \varepsilon_{i,11} + \xi_{i,11}$
$bb_{i,12} = \tau\ quit_{i,11} + v_i + \eta_{i,12}$
where *bb* is the use of balance billing and *quit* is the decision to quit in 2011. Formally, the model above removes all control variables (density levels, income, chronic disease indicator, etc.) by taking the residuals of the projections of balance billing and *quit* on these control variables (Frish-Waugh theorem). $v_i$ (respectively, $u_i$) is an individual fixed effect referring to the disutility of transportation costs for $i$ (respectively, to $i's$ risk aversion). $u_i$ and $v_i$ are supposed to be uncorrelated. $\varepsilon$ and $\eta$ are transitory health shocks influencing the decision to quit and the use of specialists who balance bill their patients. $\xi$ is the transitory policy shock related to the repeal after 2011 of the possibility to retire before 55. $\xi$ is supposed to be uncorrelated with $v$, $\varepsilon$ and $\eta$. Denoting $\widehat{\tau}_{ols}$ the OLS estimator of $\tau$, one has: $p\lim \widehat{\tau}_{ols} = \tau + a\frac{\sigma_v^2}{\sigma_q^2} + \frac{\sigma_{\varepsilon\eta}}{\sigma_q^2}$, where $\sigma_v^2$ and $\sigma_q^2$ denote the variances of $v$ and *quit* , and $\sigma_{\varepsilon\eta}$ denotes the covariance between $\varepsilon_{i,11}$ and $\eta_{i,12}$. In fixed effect estimations, $v_i$ is removed from the specification and the asymptotic bias becomes: $p\lim \widehat{\tau}_{ols,FE} = \tau + \frac{\sigma_{\varepsilon\eta}}{\sigma_q^2}$. It has the same sign as $\sigma_{\varepsilon\eta}$, which can be positive or negative.

To investigate this, we split the sample into two sub-samples,[14] one with areas with high Sector 1 specialist:population ratios ($SPR1$), the other with medium and low levels. The results are striking: when Sector 1 specialists are numerous (Table III, (2)), a coverage shock has no impact on the use Sector 2 specialists and balance billing. In other words, when patients have a genuine choice, we do not find evidence of moral hazard. Conversely, when Sector 1 specialists are scarce (Table III, (3)), we find larger impacts: better coverage yields a 14% increase in the proportion of consultations of Sector 2 specialists, and a 47% increase in the average amount of balance billing per consultation.

Finally, we find evidence of limits in access to care on a sub-sample (Table III, (4)) restricted to areas where Sector 1 specialists are scarce.This is the only case where we find that better coverage induces a significant rise in the quantity of specialist consultations $Q$ (+ 42%), in addition to impacts on the share of Sector 2 consultations and on average balance billing per consultation. This result suggests that the lack of Sector 1 specialists in these areas creates a shortage in affordable care, leading some individuals to give up on specialist consultations. This evidence of limits in access to care concerns a sizeable minority of individuals in our sample (30%).

### 6.3 Other determinants of balance billing

We now focus on the respective effects, *ceteris paribus*, of supply side organization, income and chronic diseases on specialist visits, use of Sector 2 specialists and average amount of balance billing per Sector 2 consultation. Table IV presents the estimates of parameters $\lambda$, $\beta_1$ and $\beta_2$ resulting from OLS applied to equation 2 with fixed effects, for the four indicators $Y_{it}$. For these coefficients, magnitude and significance of 2SLS estimates are similar. Table IV also displays the OLS estimates of dummy $Switcher_i$, equal to 1 if individual $i$ quits MGEN-SHI in 2011 on estimated fixed effects obtained in the panel data estimation.

On our reduced form, the impact of medical density results, on the demand side, from distance to Sector 1 or 2 specialists and, on the supply side, from the process of price setting by Sector 2 specialists. We find that a higher proportion of Sector 2 specialists at the local level leads to an increase in the price of Sector 2 consultations, with a reduced impact if there are many Sector 1 specialists. An increase from 15 (Low SPR2) to 25 (High SPR2) Sector 2 specialists per 100,000

[14] We have performed estimations allowing coefficient $\tau$ to vary across local proportions of sector 1 specialists. These estimations provide coefficients that are similar in magnitude and precision to what we obtain when splitting our sample into various sub-samples, as presented in this section.

inhabitants increases the average price of a Sector 2 visit by 5% in Low SPR1 but only by 1.6% in High SPR1. Given that the proportion of Sector 2 specialists is especially high (above 50%) for gynecologists, surgeons, ophthalmologists or ENT specialists, patients who need to consult one of these specialists have little choice. Our estimates show that a visit to one of these specialists increases the average amount of balance billing per consultation by 79%.

Other determinants such as income or health status do not affect the consumption of balance billing. An increase in income does not change the use of Sector 2 specialists.[15] However, we find a significant impact on the total number of visits to a specialist: a 10% increase in income increases the annual number of visits by 1.6%. Individuals with greater health care needs do not change their use of Sector 2 specialists either. Indeed, patients who suffer from a chronic disease are likely to increase the number of visits by 19% but do not change their proportion of Sector 2 visits.

Demand for Sector 2 consultations can also be explained by unobservable individual preferences (beliefs in Sector 2 quality, desire to avoid waiting lists). Actually, we find evidence of individual heterogeneity between stayers and switchers. To do so, we regress the dummy $Switcher_i$ on the estimated individual fixed effects obtained in the panel data estimation. Obviously, with a two-year panel, we cannot expect our estimates of $\alpha_i$ to be consistent. Nevertheless, it is interesting to examine the correlation between these estimates and recourse to Sector 2 specialists. We find that the average amount of balance billing per visit is 21% higher for switchers than for stayers. Regardless of their insurance coverage, switchers visit Sector 2 specialists more often (the share of Sector 2 is 4% higher for switchers) and those specialists charge them higher fees (+8%). So, we find that switchers, i.e. people who seek better coverage, have also a higher utilization of Sector 2 specialists.

### 6.4 Robustness checks

Given the exogenous shock on retirement rules in 2011, "early retiree in 2011" is a very convincing instrument. Unfortunately, if we use it as the only excluded instrument for QUIT, we end up with a relatively small number of compliers. In order to increase our estimators' precision we use it together with the instrument "move in 2011". In Table AIV (in the online appendix), we show that

[15] Because our specification entails fixed effects, the estimated impact of income here measures the effect of a *change* in income for a given individual. Actually, the level of income is positively correlated with the use of balance billing: between individuals, the fixed effects are significantly correlated with income levels.

most results remain similar in magnitude when using only the "early retiree in 2011" instrument. However, the result on the quantity of consultations in Low SPR1 seems mainly driven by the people who move in 2011.

Our results are also very robust to a change in the definition of SPR1 categories. We checked that results do not change when using the median to split our sample. Results are also robust when we exclude areas where there are very few Sector 2 specialists from the sample (see Table AV in the online appendix). Indeed, when the number of Sector 2 specialists is very low, having better coverage for balance billing does not have any effect, because people do not have access to a Sector 2 specialist in any case. Our estimations confirm this idea but we decided not to present this result because the number of switchers in these areas is too small.

# 7 Conclusion

In this paper we evaluate the causal impact of an improvement in health insurance coverage on the use of specialists who balance bill. We use panel data to control for unobservable individual heterogeneity and rely on instrumental variable methods to deal with possible non-exogeneity of the decision to switch to an insurer that offers better coverage for balance billing.

In France, the use of Sector 2 specialists (who balance bill) can be due to a belief that they provide better quality of care, or to difficulties in gaining access to other doctors, i.e. Sector 1 specialists, who do not balance bill. If the latter are not numerous, patients face search costs, waiting time and transportation costs in order to consult a specialist who does not charge more than the regulated fee. As a matter of fact, we find a large heterogeneity between individuals in the propensity to use Sector 2 specialists. In particular, people who decided to leave MGEN-SHI, i.e. switchers, are more likely to consult Sector 2 specialists, *ceteris paribus*.

Our estimations show that better coverage increases the demand for specialists who balance bill. On the whole sample, we find that better coverage leads individuals to raise their proportion of consultations of specialists who balance bill by 9%, which results in a 32% increase in the amount of balance billing per consultation. However, the effect of health insurance clearly depends on supply side organization. We find no evidence of any impact of a coverage shock on the use of Sector 2 specialists in areas where there are many Sector 1 specialists. About 42% of the sample live in these

areas and therefore would not increase their use of expensive physicians if their coverage for balance billing improved.

On the contrary, when Sector 1 specialists are scarce, a coverage shock has a strong impact: individuals raise their proportion of consultations of Sector 2 specialists by 14%, which results in a 47% rise in the amount of balance billing per consultation (this concerns 58% of the sample). In addition, we find evidence of limits in access to care due to balance billing in areas where Sector 1 specialists are scarce. Indeed, better coverage enables people living in these areas to increase their number of consultations. Evidence of such limitation concerns 30% of our sample, a sizeable minority. Given that low-income individuals are under-represented in our sample which consists mostly of teachers, our estimated effect of better coverage on access to specialist care should be interpreted as a lower-bound. Consequently, this result suggests that balance billing is likely to induce non negligible limits in access to specialists in France.

Our results enable us to deal with current policy questions regarding regulation of balance billing and supplementary health insurance. We have found that generous supplementary coverage can contribute to a rise in medical prices by increasing the demand for specialists who balance bill. However, this inflationary impact appears only when few specialists charge the regulated fee. When people can choose between physicians who balance bill and physicians who do not, a coverage shock has no impact. When the number of specialists who charge the regulated fee is sufficiently high (i.e. more than 52 specialists for 100,000 inhabitants), there is no evidence of limits in access to care, or of an inflationary effect of supplementary coverage. In consequence, the most appropriate policy to guarantee access to care while containing the price of care is to monitor supply in order to give patients a genuine choice of physicians. Furthermore, we have found heterogeneity in preferences such that some individuals prefer to consult specialists who balance bill. Hence, this policy allows for an improvement in welfare through insurance contracts offering balance billing coverage for those who want it. However, if policy makers are not able to ensure a sufficient supply of specialists who charge the regulated fee, limiting insurance coverage can be a second best solution to contain the increase in medical prices.

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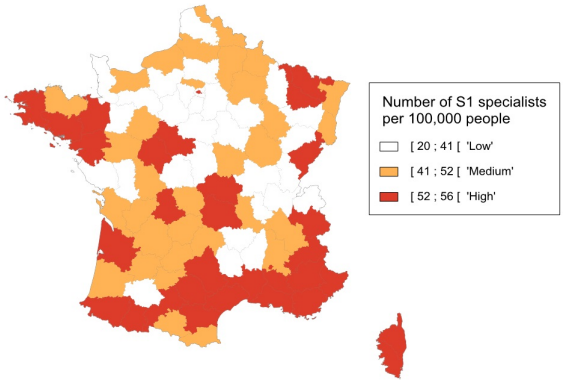
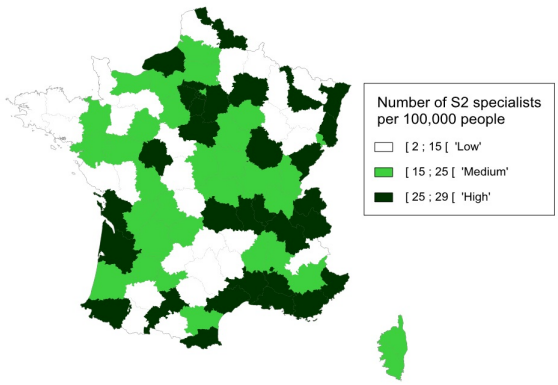
# Tables and Figures

Figure 1: Specialist:population ratio at the *département* level for Sector 1 and Sector 2 specialists in 2010

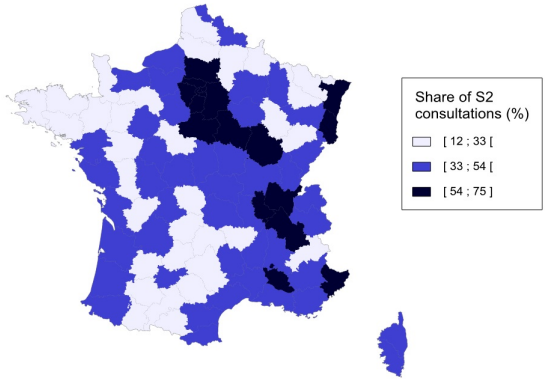



*Source:* SNIR data

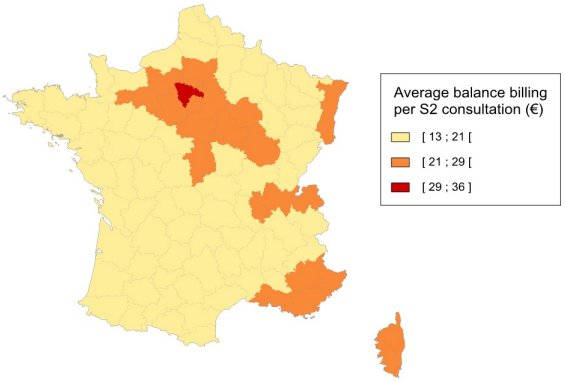



*Source:* SNIR data

Figure 2: Share of consultations of Sector 2 specialist ($Q2/Q$) and average balance billing per Sector 2 consultation (BB/Q2) in 2010




*Source:* MGEN sample, N=58,336




*Source:* MGEN sample, N=34,536

Figure 3: Control and treatment groups

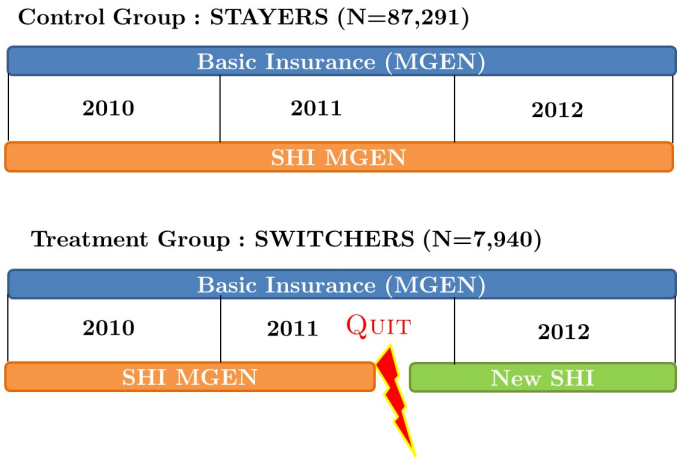



Table I: Number of Stayers and Switchers and individual characteristics in 2010

| | Whole sample N | if Spe=1 N | if Spe2=1 N | Women % | Age mean (sd) | Income mean (sd) | Chronic Disease % |
|---|---|---|---|---|---|---|---|
| Stayers | 87,291 | 39,292 | 17,848 | 65 | 55.4 (15.3) | 2434 (774) | 17.5 |
| Switchers | 7,940 | 3,819 | 2,101 | 71ˆ | 42.5ˆ(13) | 2399ˆ(770) | 6.8ˆ |

ˆSignificantly different from Stayers, p<0.01

Table II: Number of specialist visits and amount of balance billing in €uros in 2010

| | | Whole sample<br>mean (sd) | Last centile†<br>mean (sd) | Low SPR2<br>mean (sd) | High SPR2<br>mean (sd) |
|---|---|---|---|---|---|
| Q | Stayers | 3 (3.2) | 21.4 (2.7) | 2.6 (2.7) | 3.2 (3.5) |
| if Spe=1 in 2010 | Switchers | 3.2ˆ(3.4) | 22 (3.1) | 2.7 (2.8) | 3.4 * (3.6) |
| Q2 | Stayers | 1.3 (2.0) | 14 (4.2) | 0.6 (1.3) | 1.6 (2.3) |
| if Spe=1 in 2010 | Switchers | 1.6ˆ(2.4) | 15.5ˆ(3.5) | 0.7 (1.5) | 1.9ˆ(2.6) |
| Q2/Q | Stayers | 44.6% (0.44) | 100% ♭ (0.00) | 25.2% (0.38) | 53.4% (0.43) |
| if Spe=1 in 2010 | Switchers | 51.6%ˆ(0.44) | 100% (0.00) | 28% (0.40) | 60%ˆ(0.42) |
| BB | Stayers | 30 (58.9) | 433 (184) | 11.5 (31.2) | 42 (74) |
| if Spe=1 in 2010 | Switchers | 41ˆ(72.8) | 505ˆ(164) | 13 (26.7) | 53.6ˆ(85.5) |
| BB/Q | Stayers | 10.2 (12.5) | 62 (14.7) | 4.6 (8.5) | 13.5 (13.9) |
| if Spe=1 in 2010 | Switchers | 12.8ˆ(13.6) | 65 (10.8) | 5.1 (8.7) | 16ˆ(14.5) |
| BB/Q2 | Stayers | 22 (11.5) | 76.8 (17.2) | 18 (10.2) | 25 (12) |
| if Spe2=1 in 2010 | Switchers | 24ˆ(11.8) | 76 (11.3) | 18 (10) | 26ˆ(12) |

ˆSignificantly different from Stayers, p<0.01

* Significantly different from Stayers, p<0.05

*MGEN sample*: 58,336 individuals with at least one specialist consultation in 2010

*BB/Q2*: subsample of 34,536 individuals with at least one S2 specialist consultation in 2010

† Highest percentile for each variable.

♭ 32% of stayers and 37% of switchers visited exclusively S2 specialists hence $Q2/Q = 100\%$

*SPR2*: Sector 2 specialist:population ratio

*Low SPR2*: *départements* where SPR2 is under 12 per 100,000 inhabitants (first quartile of SPR2)

*High SPR2*: *départements* where SPR2 is above 29 per 100,000 inhabitants (last quartile of SPR2)

Table III: Impact of better coverage on visits to a specialist, use of Sector 2 specialists and average amounts of balance billing

Estimations with individual fixed effects, T=2010,2012

| | | N | % | log(Q) | log(Q2/Q) | log(BB/Q) | log(BB/Q2) |
|---|---|---|---|---|---|---|---|
| (1) | Whole sample / OLS | 43,111 | 100% | -0.02 | 0.01 | 0.03 | -0.00 |
| | | | | (0.02) | (0.01) | (0.02) | (0.01) |
| | Whole sample / 2SLS | | | 0.12 | 0.09** | 0.32* | -0.16 |
| | | | | (0.12) | (0.04) | (0.18) | (0.10) |
| | *[Hausman test p-value]* | | | *[0.24]* | *[0.04]* | *[0.12]* | *[0.10]* |
| (2) | High SPR1 / OLS | 17,893 | 41.5% | -0.03 | 0.01 | 0.05 | 0.01 |
| | | | | (0.03) | (0.01) | (0.04) | (0.02) |
| | High SPR1 / 2SLS | | | -0.05 | 0.05 | 0.13 | -0.23 |
| | | | | (0.25) | (0.08) | (0.39) | (0.19) |
| | *[Hausman test p-value]* | | | *[0.93]* | *[0.66]* | *[0.86]* | *[0.20]* |
| (3) | Low & Medium SPR1 / OLS | 25,218 | 58.5% | -0.03 | 0.00 | 0.01 | -0.00 |
| | | | | (0.02) | (0.01) | (0.03) | (0.01) |
| | Low & Medium SPR1 / 2SLS | | | 0.23 | 0.14*** | 0.47** | -0.06 |
| | | | | (0.14) | (0.05) | (0.22) | (0.11) |
| | *[Hausman test p-value]* | | | *[0.07]* | *[0.00]* | *[0.03]* | *[0.60]* |
| (4) | Low SPR1 / OLS | 12,915 | 30% | 0.00 | 0.01 | 0.04 | -0.02 |
| | | | | (0.02) | (0.01) | (0.04) | (0.02) |
| | Low SPR1 / 2SLS | | | 0.42** | 0.14** | 0.61** | 0.08 |
| | | | | (0.20) | (0.07) | (0.31) | (0.14) |
| | *[Hausman test p-value]* | | | *[0.03]* | *[0.04]* | *[0.06]* | *[0.45]* |

* p<0.1, ** p<0.05, *** p<0.01

*MGEN sample:* 43,111 individuals with at least one specialist consultation in 2010 and 2012
*log(BB/Q2)*: subsample of 19,949 individuals with at least one S2 specialist consultation in 2010 and 2012
*Other regressors:* 2012, income, CD, GP, specialist:population ratio, exp.phy.
*Instruments:* "early retirees"; "movers"
*Standard errors* are shown in brackets ()
*Hausman test:* H0: *QUIT* may be treated as exogenous

*SPR1:* S1 Specialist:population ratio
*High SPR1: départements* where SPR1 is above 52 per 100,000 inhabitants (last third of SPR1)
*Medium SPR1: départements* where SPR1 ranges from 41 to 52 per 100,000 inhabitants (second third of SPR1)
*Low SPR1: départements* where SPR1 is under 41 per 100,000 inhabitants (first third of SPR1)

Table IV: Effect of demand and supply side drivers on visits to a specialist, use of Sector 2 specialists and average amounts of balance billing

OLS Estimations with individual fixed effects, T=2010,2012

| | log(Q) | | log(Q2/Q) | | log(BB/Q) | | log(BB/Q2) | |
|---|---|---|---|---|---|---|---|---|
| 2012 | -0.00 | (0.01) | -0.01*** | (0.00) | -0.02** | (0.01) | 0.05*** | (0.00) |
| Chronic Disease | 0.19*** | (0.02) | -0.01 | (0.01) | -0.01 | (0.03) | -0.00 | (0.02) |
| GP | -0.04*** | (0.01) | 0.02*** | (0.00) | 0.11*** | (0.02) | 0.01 | (0.01) |
| log(Income) | 0.16*** | (0.03) | 0.01 | (0.01) | 0.07 | (0.05) | -0.00 | (0.03) |
| log(SPR1) | -0.03 | (0.21) | 0.03 | (0.07) | 0.29 | (0.33) | 0.31 | (0.20) |
| log(SPR2) | -0.02 | (0.24) | 0.15* | (0.08) | 0.87** | (0.37) | 0.47** | (0.22) |
| log(SPR1)*log(SPR2) | 0.00 | (0.06) | -0.03 | (0.02) | -0.18* | (0.09) | -0.11* | (0.06) |
| Exp.phy. | 0.26*** | (0.01) | 0.13*** | (0.00) | 0.79*** | (0.01) | 0.19*** | (0.01) |
| *Estimated fixed effect* | | | | | | | | |
| Stayer | ref. | | ref. | | ref. | | ref. | |
| Switcher | 0.05*** | (0.01) | 0.04*** | (0.00) | 0.21*** | (0.02) | 0.08*** | (0.01) |
| N | 43,111 | | 43,111 | | 43,111 | | 19,949 | |

* p<0.1, ** p<0.05, *** p<0.01

*MGEN sample*: 43,111 individuals with at least one specialist consultation in 2010 and 2012

*log*($BB/Q2$): sub-sample of 19,949 individuals with at least one S2 specialist consultation in 2010 and 2012

*Other regressor:* QUIT

*SPR1:* S1 Specialist:population ratio ; *SPR2:* S2 Specialist:population ratio

Magnitude and significancy of all coefficients remain the same with 2SLS estimation

For estimated fixed effect, second step standard errors are used for the test