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Does health insurance encourage the rise in medical prices?

A test on balance billing in France *

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Abstract

Our purpose is to evaluate the influence of health insurance coverage on the use of specialists who balance bill. We estimate the impact on patients' behavior of a shock consisting of better coverage of balance billing, while controlling for supply side drivers. We use a panel data set of 43,111 French individuals observed between January 2010 and December 2012. Individuals are observed when they are all covered by the same supplementary insurer, with no coverage for balance billing, and after 3,819 of them switched to other supplementary insurers which offer better coverage.

Our estimations show that better coverage contributes to a rise in medical prices by increasing the demand for specialists who balance bill: for individuals who enjoy better coverage the proportion of consultations of specialists who balance bill is increased by 9%, and balance billing charged per consultation by 32%. However, the impact of the coverage shock depends on local supply side organization. When the proportion of specialists who do not balance bill their patients is high enough, patients have a real choice between specialist type: there is neither evidence of an inflationary effect of supplementary coverage, nor of limits in access to care due to balance billing.

JEL classification: I13; I18; C23

Keywords: Health insurance; Balance billing; Health care access

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1 Introduction

Designed to favour equity in access to care, social health insurance is widespread in the European Union and most developed countries. Many debates have focused on its sustainability, which relies on the ability of health care systems to contain health expenditure growth. But little attention has been devoted to the fact that the effectiveness of coverage depends on the regulator's ability to control medical prices. As concerns ambulatory care, national health insurance systems usually set prices or sign agreements with physicians to set a regulated fee, which is the basis for public reimbursement. Nevertheless, physicians can generally "balance bill" their patients, i.e. charge them more than the regulated fee. Since balance billing can lead to 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 favour demand for expensive physicians, resulting in an increase in balance billing. This increase leads to a rise in SHI premiums for patients who have subscribed to such insurance, and jeopardizes coverage for patients who are covered by social health insurance only.

Balance billing was already a political issue in the United States in the late 1980s. Physicians were allowed to charge their Medicare patients more than the copayment set by the federal health insurance for the 65+ years old. In 1984, balance billing amounted to 27% of the 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 imposed restrictions on balance billing. It was eventually limited to a maximum of 9.25% of the Medicare fee in 1993 (see McKnight (2007) for a full description of Medicare's balance billing reform). Similar decisions were taken in Canada at the end of the 1980s.

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, there is a reference fee set by agreement between physicians and the health insurance administration. The NHI covers 70% of the reference fee for ambulatory care. In addition, individuals can take out supplementary private insurance: either voluntarily on an individual basis, or through occupational group contracts. Currently, 94% of the French population is covered by a supplementary health insurance contract. 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 rising in France because it has doubled over the last 15 years and now represents 2.3 billion euros. This expansion is due to an increase in both the average amount of balance billing (a 1.7% increase by year between 2004 and 2011) and the share of doctors (mostly specialists) who balance bill their patients. On the one hand, policy makers can take advantage of balance billing which permits an increase in physicians' earnings with no additional burden on social health insurance. On the other hand, balance billing raises out-of-pocket payments and might lead to a two-tier health care system where only rich people can afford specialists who balance bill their patients. Moreover, the last ten years have been marked by a continuous extension of balance billing coverage by SHI, together with a continuous increase in the amounts of balance billing, suggesting that coverage encourages balance billing. In keeping with this idea, the French government has recently introduced tax reductions to favour insurance contracts that limit their coverage of balance billing.

Balance billing in the context of social health insurance raises the following policy questions: should it be forbidden or restricted (as for Medicare patients in the USA)? Should coverage of balance billing be restricted (as recently decided in France)? On the contrary, should the government favour balance billing to promote a higher level of care quality? Or should the government only monitor the supply of care, to see that all patients have a real choice, i.e. effective access to physicians who do not balance bill their patients?

The purpose 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 the use of 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. distance to physicians, and access to physicians who do not balance bill), and the possible impact of balance billing on access to care.

What is the impact of balance billing on social welfare? After restrictions on balance billing were decided on in the USA, several theoretical papers attempted to predict the effects of such a reform on social welfare. The papers by Paringer (1980), Mitchell & 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 accept to treat fee-only patients, 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 can discriminate between patients in price and quality (Glazer and McGuire (1993); Kifmann and Scheuer (2011)). These papers conclude that balance billing contributes to an improvement in welfare because quality is higher both for fee-only 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 consequently lower social welfare.

Empirical evidence about limits on access to health care that are attributable to balance billing is rather scarce and inconclusive. Using US data, McKnight (2007) finds that the 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 and does not hinder access to care. On the other hand, a rather descriptive analysis on French data shows that reductions in recourse to health care are more frequent in regions where balance billing is more widespread (Després *et al.* (2011)).

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. On the supply side, early papers studying the influence of health insurance on medical prices 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 cent 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 relies on the sensitivity of demand to prices (Einav, Finkelstein et al.(2013)): assuming a negative price-elasticity of demand, better coverage leads to an increase in health care use.

In this paper, we examine the impact of the generosity of supplementary insurance coverage on the amount of balance billing per consultation, on patients' propensity to use specialists who balance bill, and on patients' recourse to specialists. For that purpose, we evaluate the impact on patients' behavior of a shock consisting of better coverage of balance billing, while controlling for supply side drivers, i.e. proportions of physicians who balance bill and physicians who do not. In our framework the impact of coverage on health care use is mostly linked to the influence of insurance coverage on demand for care quality and as a result, on prices set by care providers. It depends on patient's belief regarding the quality of care provided by physicians who charge balance billing and on the cost of access to physicians who do not balance bill their patients. In a way, focusing on balance billing enables us to investigate the content of moral hazard in one specific case. 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 information, at the individual level, on health care claims and reimbursements provided by basic (NHI) and supplementary (SHI) insurance. Our data makes it possible to observe enrollees when they are all covered by the same supplementary insurer (*MGEN*), with no coverage for balance billing, and after some of them switched to other supplementary insurers which offer better coverage. 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 the *MGEN* SHI. Our question is the following: Does an improvement in supplementary coverage induce an increase in balance billing per consultation or only an increase in the number of consultations? In the former case, patients would choose more expensive care thanks to their better coverage. In the latter, their would not really have a choice between physicians who balance bill and physicians who do not: the main impact of balance billing would be to limit access to care.

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 impact of the coverage shock depends on the organization of supply for care, more precisely on conditions of access (or distance) to physicians who balance bill and to physicians who do not. We can measure physician availability by the local specialist:population ratio. When this ratio is high for physicians who balance bill, the sensitivity to a coverage shock depends on whether the local specialist:population ratio (availability) of local physicians who do not balance bill is high or not. When it is high, then a coverage shock has no effect on recourse to expensive physicians or on the amount of balance billing. On the contrary, when it is low (physicians who do not balance bill are scarce), a coverage shock has a strong impact: individuals raise their proportion of consultations of specialists who balance bill by 22%, which results in a 92% rise in the amount of balance billing per consultation; in addition, there is evidence of limitation in access to care for a minority of individuals in this situation (10% of the sample). On the other hand, when there are very few physicians who balance bill, a coverage shock has no impact on patient behavior (10% of the sample). These results are obtained with instrumental variable estimates on models with individual fixed effects, hence controlling for unobserved individual heterogeneity and for non exogeneity of the decision to switch to a more generous SHI.

To sum up, we find evidence of moral hazard and, for some individuals, of limits in access to care due to balance billing. However, our main result is the absence of impact of a coverage shock when people can choose between physicians who balance bill and physicians who do not. On the basis of these results, the appropriate policy is not to limit the extent of coverage, but to monitor the supply of care in order to guarantee patients a real choice of their physicians.

This paper is organized as follows. Section 2 describes French regulation of ambulatory care, and formalize, in this context, patients' decisions to consult a physician who balance bill. In section 3, we present our data and empirical strategy. Section 4 makes explicit the empirical specification. Results and robustness checks are presented in Section 5 and section 6 concludes. Tables and figures are displayed in Appendix.

2 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€ in 2012 for a routine visit), and get fiscal deductions in return. If they join "Sector 2", they are allowed to set their own fees. Access to Sector 2 being strongly limited for GPs since 1990, most of them belong to Sector 1: they are 87% in 2012. Hence the issue of balance billing concerns mostly specialists. Balance billing adds 35% to the annual earnings of Sector 2 specialists. The average proportion of specialists operating in Sector 2 amounts to 42% in 2012. However, this proportion varies dramatically across regions and specialties: for instance, the proportion of specialists operating in Sector 2 is 19% for cardiologists, 73% for surgeons and 53% for ophthalmologists.

The net price faced by patients for a consultation depends on whether or not they consult a Sector 2 specialist, and on their SHI coverage. Currently, coverage of balance billing varies between SHI contracts: on the one hand, a sizeable proportion of SHI subscribers are not covered for balance billing (52% of subscribers on an individual basis). One the other hand, 48.5% of all SHI policyholders (individual contracts and occupational group contracts altogether) state that they are well covered for balance billing (Celant and alii (2014)).

2.1 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 amounts to charging a higher price for the same thing. However, access to Sector 2 is restricted from 1990 on to physicians who are able to demonstrate a qualifying hospital practice, which suggests that they have a higher education and more ability. Apart from this fact, patients have no information on possible differences in quality of care provided by physicians. In this context, physician's choice to belong to Sector 2 can be seen as a signal about his ability (Spence (1973)) and patients might prefer to consult a Sector 2 physician to have a better chance to get high quality of care (see also Batifoulier and Bien (2000)). Nevertheless, besides 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 accessible.[1]

Consider a utility maximizing patient: he/she chooses the levels of consumption of non-medical goods (z) and of specialist consultations to Sector 1 and Sector 2 physicians (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 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 consultations to 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 Insurance (NHI), i.e. 30 % for a consultation.[2] In addition some SHI contracts offer coverage of balance billing. We denote γ the rate of coverage by the 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. The cost of access to Sector 1 or 2 specialists is also influenced by their availability, which can be measured by the local specialist:population ratio. We denote d_1 and d_2 the search costs, as well as transportation and waiting time costs associated to the access to a Sector 1 or a Sector 2 specialist. d_1 and d_2 are linked to the local specialist:population ratios of Sector 1 and 2 specialists.

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,[3] the relative price of a Sector 2 consultation is given by:[4]

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

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

[3] Except for the negligible copay of 1 euro.

[4] Given that most contracts impose a ceiling on balance billing coverage, we do not suppose that s is a coverage rate, but this has no importance on the model's predictions.

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

Given this formalization, the decision to consult a Sector 2 specialist is described in Figure 1, where the curves are isoquants relative to patient's subjective health production function. The iso-cost lines have a slope equal to the relative price $\frac{p_2}{p_1}$. The graph assumes that the patient believes that consultations of a Sector 1 and Sector 2 physician are substitutable. In this framework, 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 Figure 1 does not represent the case where Sector 2 physicians are very scarce. In this case, $\frac{p_2}{p_1} \to \infty$ whatever the value of s: in this situation, a change is 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 physician 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.

2.2 Availability of Sector 1 and Sector 2 specialists

As stated above, supply side organization can influence the recourse to Sector 2 specialists. Figure 2 provides geographical information about the specialist:population ratio of Sector 1 and Sector 2 specialists by *département* (there are 95 *départements* in France). The specialist:population ratio is an indicator of physicians' availability, i.e. of search, transportation and waiting time costs associated to access to a Sector 1 or a Sector 2 specialist. Figure 2 shows that there is not always an inverse relation between the specialist:population ratio of Sector 1 specialists and the specialist:population ratio of Sector 2 specialists: on the Mediterranean cost, there are many of both types of specialists. Conversely, in Brittany (North-West of France), there are many Sector 1 specialists and very few Sector 2 specialists. It is the reverse in the Parisian region, with many Sector 2 specialists and very few Sector 1 specialists.

Figure 3 gives for each *département*, the proportion of Sector 2 specialist consultations and average balance billing per consultation, as computed on our sample. The comparison with figure 2 suggests a strong impact of supply side drivers on both propensity to see a sector 2 specialist and the amount of balance billing.

3 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* manages both basic (NHI) and supplementary insurance (SHI). Our data stemmed from administrative *MGEN* data: they provide, for each policyholder, detailed information about his/her medical bills and reimbursements for both basic and supplementary insurances.

MGEN is a *Mutuelle*, i.e. a non profit cooperative insurer who provides mandatory basic health insurance for teachers and Ministry of education's employees. Most of them are civil servants. *MGEN* also supplies supplementary health insurance in the form of a unique contract which offers a minimal supplementary coverage: it covers only copayments and not balance billing. The premium is defined as a proportion of the enrollee's wage. People can subscribe to this SHI on a voluntary basis. The fact that premiums are proportional to wages gives *MGEN* a very specific place in the SHI marketplace. In the short term, young, healthy and wealthy teachers should be better of purchasing a "tailor made" coverage with premium depending on age. However, *MGEN* contract becomes more valuable as individuals are getting older and sicker. So in order to avoid free rider's behavior, *MGEN* penalizes late entry and makes SHI break-up irrevocable. Currently, *MGEN* covers 3.3 million individuals for NHI basic health insurance (all teachers and Ministry of education's employees, their family and pensioners). Among them, 2.3 million purchased the SHI contract.

3.1 Empirical strategy

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

From *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 are policyholders, who remained *MGEN*'s enrollees for SHI over the observation period (2010-2012), the latter were SHI subscribers in January 2010, but have terminated their contracts in 2011. Because they are still covered by *MGEN* for their basic insurance in 2012, we still observe their health expenditures all over the period. Switchers' decision to leave in 2011 creates a positive shock on their SHI coverage. Therefore, we can use Stayers and Switchers as control and treatment groups [see Figure 4].

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

The original sample was made 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, which amounts to 0.5%. We excluded the people who lived in *départements* or *territoires d'outre-mer* (outside territories such as Guadeloupe, Martinique, etc.) and the 1% top 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 ; hence we focus on specialist consultations. More precisely, we measure the effect of insurance coverage on the decision to visit a specialist who charges balance billing, conditional on the use of specialist consultation. Therefore, we restricted the sample to individuals who had at least one specialist consultation in 2010 and 2012 (Spe=1). They represent 45% of stayers and 48% of switchers. To sum up we will use a sample of 43,111 individuals whose 39,292 are stayers and 3,819 switchers; they are observed in 2010-2012 and have at least one specialist consultation.

3.2 Variables

Our data provide information at individual level about the total number of specialist consultations (denoted Q), the number of consultations of a Sector 2 specialist ($Q2$) 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 $Q2/Q$, the average balance billing per consultation, BB/Q and the average balance billing charged per Sector 2 consultation, $BB/Q2$ (this latter indicator is computed on individuals who had at least one visit to sector 2 specialist (Spe2=1)).

Using these four indicators allows us to distinguish between patients' use of specialists, patients' decision to consult a Sector 2 specialist, and the level of balance billing charged which depends on price setting by specialists on the supply side, and on demand for expensive specialists (as a signal of quality) on the demand side. 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 the associated balance billing level.

At the individual level, we can only compute an indicator of 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 fees associated to each consultation. However, we can take advantage of the specialty needed by patients to control for the extent of their choice as concerns Sector 1 or 2 specialists. In France, gynaecologist, ophthalmologist, surgeon and ENT specialists charge balance billing in a much larger proportion than their colleagues. As a result, it is much more difficult to avoid a Sector 2 physician for a patient whose health care needs imply a recourse to one of these specialists, and the balance billing per consultation is influenced by patient's care needs. To deal with this heterogeneity, we introduce a dummy variable referring to "expensive physicians" ($Exp.Phy$), which is equal to 1 when the individual visits at least one of these specialists.

Demand characteristics include gender, age, income and health status. Our income variable refers to the individual's wage. It is computed using the fact that 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 consultations to a GP, specialist:population ratios and the $Exp.Phy$ dummy variable. In France, one can visit a specialist without seeing a GP before. More exactly, patients do not need their GP's agreement to consult gynaecologists or ophthalmologists. For other specialties GPs are gatekeeper and their consent determines the extent of national health insurance reimbursement.[5] We control for this specific feature with a dummy indicating that the

[5] Reimbursements are reduced in case of recourse to specialist without GP's referral and incentives are given to SHI to prevent the coverage of this penalty.

patient had at least one visit to a GP in the current year ($GP = 1$). Supply side organization is taken into account using 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. Information on specialist:population ratios comes from data provided by the NHI,[6] which are available only for 2010 and 2011. Waiting for a forthcoming update, we use information relative to 2011 for year 2012.

3.3 Basic features of the data

Since *MGEN* enrollees are mostly teachers, the sample is not representative of the French population [Table 1]. They are mostly women (65%), their average age is 55, and the average monthly wage is equal to 2434€, which is higher than the average wage in France. We caution against generalizing our results to different settings, because we are likely to deal with a specific population as far as health habits, values and risk aversion are concerned.

A result common to many papers devoted to competition in health insurance is the 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%). Contrary to results found in the literature, switchers have lower income than stayers. This is due to the fact that *MGEN* enrollees are all teachers: hence wage variability is reduced in comparison with a sample which would be drawn on the whole population; in addition, the remaining variability is strongly correlated with age because promotions are mostly decided on the basis of seniority. So, in our case, switchers have a lower income because they are on average thirteen years younger than stayers.

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

The second column of table 2 gives, for each indicator, the mean and standard deviations for observations that are higher than the 99 percentile (average of the top 1%). The top 1% average values of balance billing show that, even with a SHI contract, individuals are not protected against high out-of-pocket expenditures: 433€ for stayers and 505€ for switchers. This is especially true because these figures are computed on a sample, whose top 1% consultation users have been already excluded: on the whole sample, we find top 1% average balance billing that are equal to 638€ for stayers and 914€ for switchers.

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

The two last columns of table 2 display, for each indicator, the mean and standard deviations computed for individuals living in places 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 where Sector 2 specialists are numerous (in last column).

4 Empirical specification

The causal impact of a positive coverage shock on our variables of interest can be identified with the estimation of 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 $QUIT$ for having left $MGEN$ in 2011 ($QUIT = 1$ for Switchers in 2012, $= 0$ in 2010). We also include a dummy variable for 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.. 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 patient's need of 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 α_i. The disturbance ε_{it} is supposed to be iid $(0, \sigma_\varepsilon^2)$.

Specifying a fixed effect α_i enables us to allow for a potential non exogeneity of the decision to leave $MGEN$ that would arise from a correlation with individual unobserved heterogeneity. These effects are likely to be connected to switchers' permanent beliefs in better quality of care in Sector 2, or specific disutility of time consuming transportations and search effort. Decision to leave $MGEN$ might also be induced by a transitory shock on health care needs (illness onset, that we cannot observe perfectly, although we observe and control for the onset of chronic diseases) or by an information shock that affects beliefs regarding quality of care in Sector 2. In this case, there is a correlation between ϵ_{it} and the decision to leave *MGEN*. 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 an improved coverage on Y_{it} (i.e. the use of specialist consultations, the proportion of sector 2 consultations and the amount of balance billing per consultation).

A reliable instrument has to be correlated with the decision to leave $MGEN$ ($QUIT$) and must not affect directly 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 the decision to move in 2011. The threshold chosen for retirement age refers to a specific right for teachers that allowed those who raised three kids to retire before they were 55. This right has been revoked recently and eligible teachers had to use this opportunity before January 2012. Hence the propensity to retire before 55 rose strongly between 2010 and 2011, as shown in Figure 5. This policy decision creates an exogenous shock that gives us a good instrument. Indeed, a high number of teachers retired in 2011 before they were 55 and decided to leave *MGEN* SHI the same year. Moreover, the rules defining the *MGEN* premium entail a rise in the proportion of income from 2.97% before retirement to 3.56% after. This shock on premium is likely to be a reason to leave which is uncorrelated with health care needs or beliefs in the quality of care is Sector 2. We also use the decision to move in 2011 as an instrument for the decision to quit *MGEN* for SHI. Indeed, moving always induces high administrative costs that are likely to reduce the reluctance to face the relatively limited costs associated to a switch of SHI. The results of the Sargan tests we have performed show that these two instruments, "moving in 2011" and "retired before 55" are compatible. Used together, they increase the estimator's precision on the whole sample. Note that we have no accurate information on individuals' adresses: we observe the occurrence of a move only when people have moved in another département. Actually the instrument "moving in 2011" cannot be used for the estimations we performed on sub-samples: the move must occur within the sub-sample, which eliminates too many observations.

5 Results

Our results are displayed in tables 3 and 4. Table 3 gives the estimates of the causal impact of better coverage on the four indicators Y_{it}. Table 4 presents the estimations of the other regressors' influence and of individual fixed effects.

Several tests support the consistency of our instrumental variable estimates. For estimations performed on the whole sample, it was possible to perform Sargan tests which all led to a non rejection of instrument compatibility. [7] 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[8]. Following Bound, Jaeger and Baker (1995), this suggests that we can rule out instruments' weakness. We rely on IV results when Hausman tests led to a rejection of $QUIT$ exogeneity. Otherwise we can rely on OLS estimates, which are consistent with IV estimates when $QUIT$ is exogenous. Recall that all estimations include individual fixed effects. Of course, IV estimates provide local average treatment effects (LATE).

[7]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-value that are equal, respectively, to 0.99, 0.81, 0.64 and 0.12.

[8]For the whole sample, the estimated coefficients of "retired before 55" and "moved" are respectively equal to 0.37 and 0.11. The F-stat for the significance of the two instruments is equal to 336.2. For all subsamples, the estimated coefficient of "retired before 55" is above 0.30 and F-stat for the significance of the instrument lies between 38.8 and 185. Detailed results are available on request.

5.1 Impact of better coverage on recourse to Sector 2 specialist and balance billing

Table 3 provides the OLS and IV estimates of parameter τ, which is the impact of the coverage shock for the whole sample (line 1) and various sub-samples (lines 2-9), on recourse to specialist, the proportion of sector 2 consultations and the amount of balance billing per consultation. For each line and dependent variable we also provide the Hausman test p-value (rejection of $QUIT$ exogeneity when it is lower than 5%). As stated above, we control for unobservable individual heterogeneity and potential non-exogeneity of $QUIT$. Note that a more simple difference-in-differences approach which compares stayers and switchers between 2010 and 2012 led to the same results than our OLS with fixed effect estimates.

On the whole sample (line 1), better coverage has no impact on recourse to specialist ($log(Q)$) but increases by 9% the share of Sector 2 consultations, 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 SHI is likely to encourage the rise in medical prices. However, we do not find a significant effect of better coverage on the price for S2 consultations ($log(BB/Q2)$): patients who used to visit S2 specialists do not take advantage of their better coverage to visit even more expensive physicians. This suggests also that physicians do not adjust their prices to their patients' coverage, at least in the short run.

As concerns significant coefficients, we find 2SLS estimates that are larger than the OLS estimates (see, for instance, table 3, line 1). At first view, it seems surprising to find a negative endogeneity bias, given that people are supposed to quit to enjoy a better coverage for balance billing. In fact, such negative bias is quite possible: given that our specifications allow 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 captured through a dummy variable in the regressors. Taking the example of a tibia fracture, the patient experiences a lot of consultations with large balance billing and decides to quit MGEN in 2011 for better coverage. In 2012, her needs in sector 2 specialist consultation are 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). [9]

[9] 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. We suppose $a > 0$: people are likely to quit for better coverage in relation to the balance billing they were charged during the previous year (side regressions we have performed give empirical support to $a > 0$, results are available on request). 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. ε and η are transitory health shocks influencing decision to quit and the use of specialists who balance bill their patients. ξ is the transitory policy shock related to the repeal after 2011 of the possibility to retire before 55. ξ is supposed to be uncorrelated with v, ε and η. Denoting $\widehat{\tau}_{ols}$ the OLS estimator of τ, one has: $p\lim\ \widehat{\tau}_{ols} = \tau + a\frac{\sigma_v^2}{\sigma_q^2} + \frac{\sigma_{\varepsilon\eta}}{\sigma_q^2}$, where σ_v^2 and σ_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.

5.2 The effect of supply side organization on the impact of better coverage

As stated above 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. One has: $\frac{p_2}{p_1} = \frac{(bb-s)+d_2}{d_1}$. Hence supply side organization should have a strong impact on recourse to Sector 2 specialists and balance billing. As shown in figure 2, local availability of Sector 1 and 2 specialists varies dramatically across *départements*. This is likely to induce an heterogeneity in the impact τ of better coverage, that we examine in what follows [10].

To check this prediction, we have performed separate estimations of model (2) on regions defined as groups of *départements*. On the basis of figure 2, three regions are considered: *Ile-de-France* (in the center of France including Paris), *PACA-Aquitaine-Alsace-Rhône* (*Côte d'Azur*, East and South-West of France), and *Normandie-Bretagne-Pays de Loire* (West and North-West). We find very different impacts between regions. In *Ile-de-France* and *PACA-Aquitaine-Alsace-Rhône,* (lines 2 and 3 on Table 3), where there is a lot of Sector 2 specialists, better coverage induces more Sector 2 consultations and balance billing. On the contrary, in *Normandie-Bretagne-Pays de Loire,* where there are very few Sector 2 specialists, we find no significant impact of better coverage on any indicator of care use or recourse to Sector 2 specialists (line 4 on Table 3).

To investigate more thoroughly the influence of local availability of Sector 1 and 2 specialists on the impact of $QUIT$, we have defined sub-samples on the basis of the local levels of Sector 1 and Sector 2 specialist:population ratios. Lines 5 and 6 of Table 3 oppose areas with low and high Sector 2 specialist:population ratios, a low (resp. a high) level of specialist:population ratio being defined as belonging to the first (resp. the last) quartile of $SPR2$ distribution across *départements*. We find no effect of better coverage when there are very few Sector 2 specialists (line 5). In this case, better coverage does not change the main reason why patients do not visit Sector 2 specialists: they cannot manage to find or reach one ($\frac{p_2}{p_1} \rightarrow \infty$). On the contrary, when there is a lot of Sector 2 specialists (line 6), better coverage induces a 18% increase in the proportion of consultations of Sector 2 specialists, which results in a 75% increase in the amount of balance billing per consultation. This is pure substitution: the total number of consultations in unchanged.

However, these estimated impacts could again hide heterogenous impacts within the areas with a high level of Sector 2 specialists. Indeed, when d_2 is finite, we have: $\frac{\partial \frac{p_2}{p_1}}{\partial s} = -\frac{1}{d_1}$, suggesting that the impact should depend on the availability of Sector 1 specialists. To investigate this, we split the areas characterized by a high level of Sector 2 into two sub-samples: the one with a high level of Sector 1 specialist:population ratio, the other one with medium and low levels of $SPR1$. The results are striking: when Sector 1 specialists are numerous (line 7, Table 3), a coverage shock has no impact on recourse to Sector 2 specialists and balance billing. In other words, when patients have a real choice, we do not find evidence of moral hazard. Conversely, when Sector 1 specialists are not numerous (line 8), we find larger impacts: better coverage

[10] We have performed estimations allowing coefficient τ to vary across regions and across local proportions of sector 1 and sector 2 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.

induces a 22% increase in the proportion of consultations of Sector specialists, and a 92% increase in balance billing.

Finally, we find evidence of limits in access to care on a restricted sub-sample (line 9), relative to areas characterized by both profusion of Sector 2 specialists and scarcity of Sector 1 specialists. This is the only case where we find a significant impact of better coverage on the quantity of specialist consultations Q, with a 55% rise, in addition to impacts on the share of Sector 2 consultations and on the average balance billing per consultation. This result suggests that due to the lack of Sector 1 specialists in these areas, affordable care is restricted and leads some individuals to give up on specialist consultations. Note that this evidence of limits in access to care concerns a small proportion of individuals in our sample (10%).

5.3 Adverse selection effects and 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 S2 specialists and average amount of balance billing per S2 consultation. Table 4 presents the estimates of parameters λ, β_1 and β_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 indeed similar. Table 4 also displays the OLS estimates of dummy $Switcher_i$, equal to 1 if individual i quits MGEN in 2011 on estimated fixed effects obtained in the panel data estimation.

Supply side organization directly impacts the amount of balance billing through two mechanisms: the more or less constrained choice to consult a S1 or a S2 physician and the price of S2 consultations. For some specialties such as gynaecologists, surgeons, ophthalmologists or ENT specialists, the proportion of S2 specialists is especially high (above 50%) making the choice to visit a S1 or a S2 specialist heavily constrained. Indeed, we find that a visit to one of these specialists is likely to increase by 79% the average amount of balance billing per consultation. Competition between S2 physicians seems to lead to an increase in the price of S2 consultations. For the average value of S1 specialist:population ratio (50 physicians for 100,000 people), a 1% increase in S2 specialists:population ratio increases the average price of a Sector 2 visit by 1.4%.

Contrary to supply side effects, other determinants such as income or health status do not impact the consumption of balance billing. An increase in income does not change the recourse to S2 specialists. However, we find a significant effect on the total number of visits to a specialist: a 1% increase in income increases the total number of visits by 0.16%. Individuals with higher health care needs do not change their use of S2 specialists either. Indeed, patients who suffer from a chronic disease are likely to increase by 19% the number of visits but do not change their proportion of S2 visits.

Demand for S2 consultations can also be explained by unobservable individual preferences (beliefs in S2 quality, willingness to avoid waiting lists). Actually, we find strong 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 α_i to be consistent. Nevertheless, we think relevant to examine the relation of these estimates with the propensity to use S2 specialists. Indeed, the average amount of balance billing per visit is 18% higher for Switchers than for Stayers. Regardless of their health insurance coverage, Switchers visit more often S2 specialists (the share of S2 is 3% higher for switchers) and those specialists charge them higher fees (+7%). This means that individuals with higher preferences for S2 visits are more likely to ask for better coverage. This finding is consistent with classical results on adverse selection.

5.4 Robustness checks

On the whole sample, our IV estimates are performed with two instruments ("retired before 55" and "moving") contrary to sub-samples estimates where only "retired before 55" is used. We have to check that IV estimates on the whole sample and on sub-samples remain comparable. So we checked that coefficient magnitudes are similar when using only the "retired before 55" instrument on the whole sample, as for the sub-sample estimations. Results are similar in magnitude, with smaller precision (with no change as concerns impact significance).

Moreover, our IV estimates measure the effect of a better coverage on a specific population which concerns mostly women between 40 and 55 years old. In addition to the fact that only a LATE is estimated here, we have to check the robustness of the results when restricting the sample of untreated to people that are similar to the treated that are captured by the instrumental variable. This is the case: our results are robust when we restrict the sample to women between 40 and 56 years old. Therefore, the effect of better coverage is not driven by compliers' demographic characteristics.

6 Conclusion

In this paper we evaluate the causal impact of a positive shock on supplementary 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 the possible non-exogeneity of the decision to switch to a supplementary insurer that offers better coverage for balance billing.

In France, recourse to Sector 2 specialists (who balance bill) can be due to a belief that they provide better quality of care, or to difficulties in access to Sector 1 specialists that include search, waiting time and transportation costs. We find heterogeneity in preferences and beliefs that lead to more recourse to Sector 2 specialists. In particular, people who decided to leave *MGEN,* i.e. the switchers, are more likely to use Sector 2 specialists, *ceteris paribus.*

Our estimations show that better coverage contributes to a rise in medical prices by increasing 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 supplementary health insurance clearly depends on supply side organization. As might be expected, geographical areas where there are few sector 2 specialists are not affected by such moral hazard. Interestingly, we find no evidence of any impact of a coverage shock on recourse to Sector 2 specialists in areas where there are many Sector 1 specialists. About 34% of the sample are in these two cases (scarcity of Sector 2 specialists or availability of Sector 1 specialists) and therefore would not increase their use of expensive physicians if their coverage for balance billing were better.

On the contrary, when the Sector 2 specialist:population ratio is high and when Sector 1 specialists are not numerous, a coverage shock has a strong impact: individuals raise their proportion of consultations of Sector 2 specialists by 22%, which results in a 92% rise in the amount of balance billing per consultation (this concerns 25% of the sample). In addition, there is evidence of limitation in access to care due to balance billing for individuals living in areas characterized by both profusion of Sector 2 and scarcity of Sector 1 specialists. Indeed, better coverage enables them to increase their number of consultations. Although evidence of such limitation concerns only a minority of people (10%), it is worthwhile to stress that low-income individuals are under-represented in our sample because *MGEN* covers mostly teachers. Hence, our estimated effect of better coverage on access to health care should be interpreted as a lower-bound.

Our results enable us to tackle some current policy questions about balance billing regulation. We have found that generous supplementary coverage can encourage balance billing, and consequently have an inflationary effect on medical prices. However, this inflationary impact appears only when Sector 2 specialists are numerous and Sector 1 specialists relatively scarce. When people can choose between physicians who balance bill and physicians who do not, a coverage shock has no impact on the use of Sector 2 specialists. When the number of specialists who charge the regulated fee is sufficiently high (i.e. more than 56 specialists for 100,000 inhabitants), there is neither evidence of limitation in access to care, nor of inflationary effect of supplementary coverage. As a consequence, the most appropriate policy is to monitor the supply of care in order to guarantee patients a real choice of physicians. Given that we have found heterogeneity in preferences such that some individuals prefer Sector 2 specialists, this policy allows for an improvement in welfare through a supply of insurance contracts offering balance billing coverage for those who want it. On the contrary, if policy makers are not able to ensure a sufficient supply of sector 1 specialists, limiting insurance coverage can be a second best solution to contain the increase in medical prices.

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Appendix: Tables and Figures

Figure 1: Effect of a better coverage for balance billing (from $s = 0$ to $s > 0$) on the decision to consult a S2 specialist (x_2)

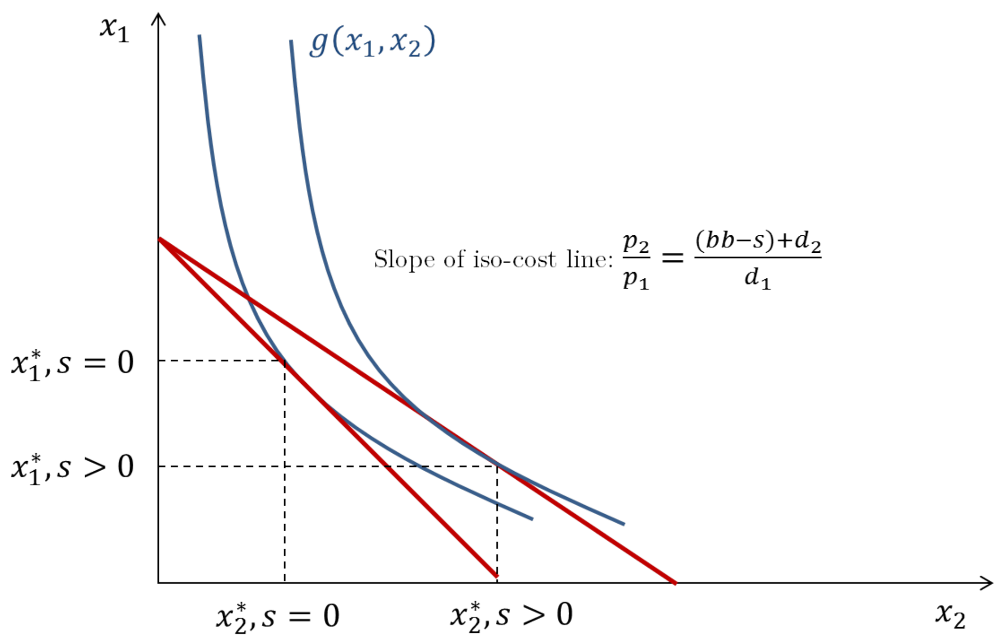
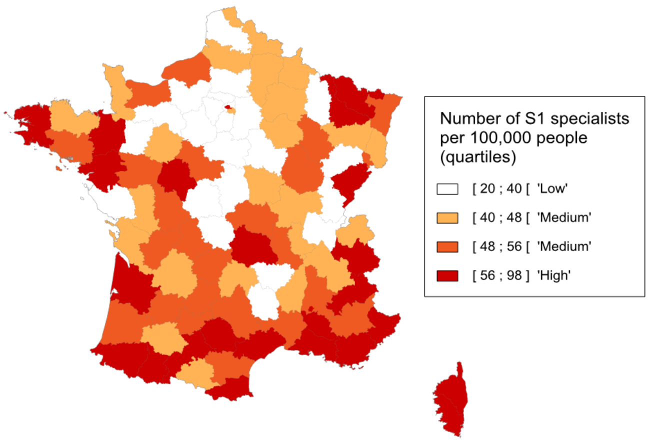
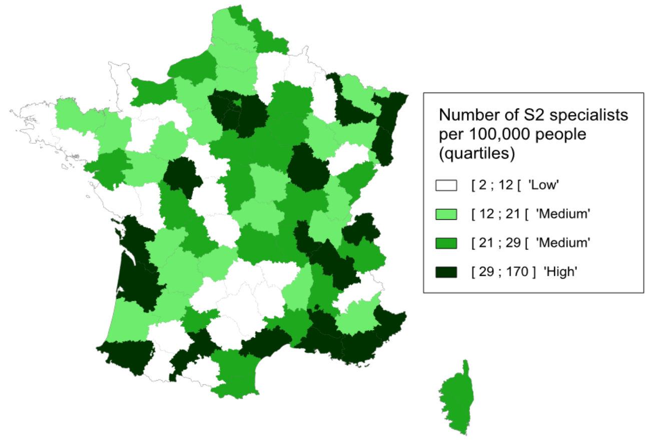


Figure 2: Specialist:population ratio at the *département* level for Sector 1 and Sector 2 specialists in 2010

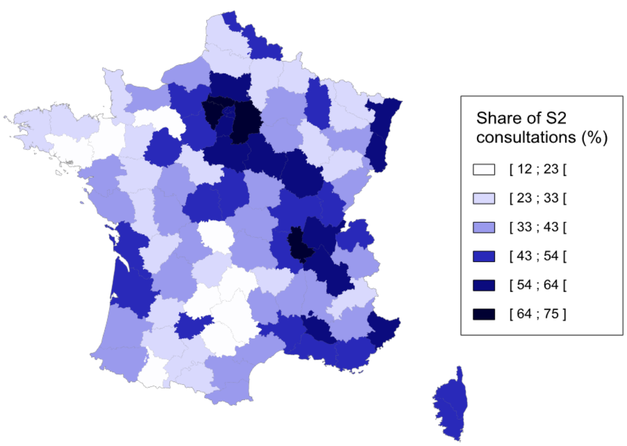


Source: SNIR data

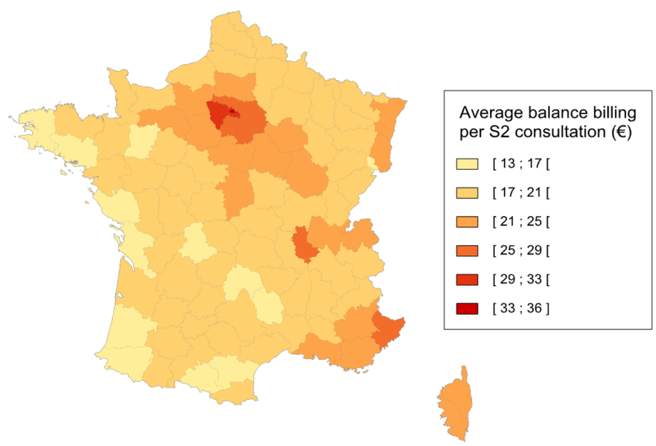


Source: SNIR data

Figure 3: 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 4: Control and treatment groups

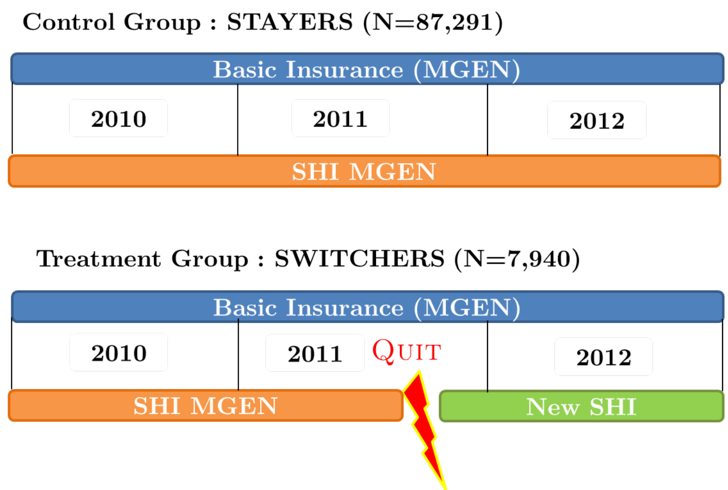


Table 1: Number of Stayers and Switchers and individual characteristics in 2010

	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	71 ^	42.5 ^ *(13)*	2399 ^ *(770)*	6.8 ^

^ Significantly different from Stayers, $p<0.01$

Table 2: Number of specialist visits and amount of balance billing in €uros in 2010

		Whole sample mean *(sd)*	Last centile† mean *(sd)*	Low SPR2 mean *(sd)*	High SPR2 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	3.2 ^ *(3.4)*	22 *(3.1)*	2.7 *(2.8)*	3.4 * *(3.6)*
Q2	Stayers	1.3 *(2)*	14 *(4.2)*	0.6 *(1.3)*	1.6 *(2.3)*
if Spe=1 in 2010	Switchers	1.6 ^ *(2.4)*	15.5 ^ *(3.5)*	0.7 *(1.5)*	1.9 ^ *(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% ^ *(0.44)*	100% *(0.00)*	28% *(0.40)*	60% ^ *(0.42)*
BB	Stayers	30 *(58.9)*	433 *(184)*	11.5 *(31.2)*	42 *(74)*
if Spe=1 in 2010	Switchers	41 ^ *(72.8)*	505 ^ *(164)*	13 *(26.7)*	53.6 ^ *(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	12.8 ^ *(13.6)*	65 *(10.8)*	5.1 *(8.7)*	16 ^ *(14.5)*
BB/Q2	Stayers	22 *(11.5)*	76.8 *(17.2)*	18 *(10.2)*	25 *(12)*
if Spe2=1 in 2010	Switchers	24 ^ *(11.8)*	76 *(11.3)*	18 *(10)*	26 ^ *(12)*

^ Significantly 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 3: Impact of better coverage on visits to a specialist, recourse to 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
	Whole sample / 2SLS ♮†			0.11	0.09**	0.32*	-0.15
	(Hausman test p-value)			*(0.26)*	*(0.03)*	*(0.11)*	*(0.11)*
(2)	Ile de France	7,988	18.5%	0.03	0.02*	0.11**	0.01
	Ile de France / 2SLS ♮			0.35	0.14	0.71*	0.09
	(Hausman test p-value)			*(0.22)*	*(0.15)*	*(0.15)*	*(0.68)*
(3)	PACA, Aquitaine, Rhône, Alsace / OLS	11,690	27%	-0.02	0.01	0.06	0.00
	PACA, Aquitaine, Rhône, Alsace / 2SLS ♮			-0.01	0.19**	0.71**	-0.12
	(Hausman test p-value)			*(0.99)*	*(0.02)*	*(0.06)*	*(0.47)*
(4)	Normandie, Bretagne, Pays de Loire / OLS	5,550	13%	-0.03	-0.02	-0.10	0.02
	Normandie, Bretagne, Pays de Loire / 2SLS ♮			0.15	0.04	-0.08	-0.10
	(Hausman test p-value)			*(0.67)*	*(0.67)*	*(0.97)*	*(0.70)*
(5)	Low SPR2/ OLS	4,298	10%	-0.08	0.01	0.05	0.08
	Low SPR2/ 2SLS ♮			0.53	0.04	-0.53	-0.91*
	(Hausman test p-value)			*(0.23)*	*(0.87)*	*(0.42)*	*(0.02)*
(6)	High SPR2 / OLS	21,570	50%	0.00	0.01*	0.06**	0.00
	High SPR2 / 2SLS ♮			0.07	0.18***	0.75**	0.01
	(Hausman test p-value)			*(0.75)*	*(0.02)*	*(0.04)*	*(0.97)*
(7)	High SPR2*High SPR1 / OLS	10,462	24%	-0.01	0.01	0.06	0.00
	High SPR2*High SPR1 / 2SLS ♮			0.05	0.14	0.56	-0.04
	(Hausman test p-value)			*(0.85)*	*(0.27)*	*(0.37)*	*(0.86)*
(8)	High SPR2*Low and medium SPR1 / OLS	10,903	25%	0.01	0.01	0.06	-0.00
	High SPR2*Low and medium SPR1 / 2SLS ♮			0.07	0.22**	0.92**	0.05
	(Hausman test p-value)			*(0.83)*	*(0.02)*	*(0.04)*	*(0.79)*
(9)	High SPR2*Low SPR1 / OLS	4,491	10%	0.02	0.01	0.09*	0.01
	High SPR2*Low SPR1 / 2SLS ♮			0.55*	0.17*	0.94**	0.07
	(Hausman test p-value)			*(0.09)*	*(0.11)*	*(0.07)*	*(0.80)*

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

MGEN sample: 43,111 individuals with at least one specialist consultation
$log(BB/Q2)$: subsample of 19,949 individuals with at least one S2 specialist consultation
Other regressors: 2012, income, CD, GP, specialist population ratio, exp.phy.
Instruments: ♮ = Retired before 55; † = moved out
Hausman test: H0: $QUIT$ may be treated as exogenous

SPR1: S1 Specialist:population ratio ; *SPR2:* S2 Specialist:population ratio
High SPR2: départements where SPR2 is above 29 per 100,000 inhabitants (last quartile of SPR2)
Low SPR2: départements where SPR2 is under 12 per 100,000 inhabitants (first quartile of SPR2)
High SPR1: départements where SPR1 is above 56 per 100,000 inhabitants (last quartile of SPR1)
Medium SPR1: départements where SPR1 ranges from 40 to 56 per 100,000 inhabitants (2nd & 3rd quartiles of SPR1)
Low SPR1: départements where SPR1 is under 40 per 100,000 inhabitants (first quartile of SPR1)

Table 4: Effect of demand and supply side drivers on visits to a specialist, recourse to Sector 2 specialists and average amounts of balance billing

Estimation 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**	0.05***
Chronic Disease	0.19***	-0.01	-0.01	-0.00
GP	-0.04***	0.02***	0.11***	0.01
log(Income)	0.16***	0.01	0.07	-0.00
log(SPR1)	0.16	0.04	0.43	0.55**
log(SPR2)	0.18	0.17*	1.07**	0.75***
log(SPR1)*log(SPR2)	-0.05	-0.03	-0.23**	-0.17***
Exp.phy.	0.26***	0.13***	0.79***	0.19***
Estimated fixed effect				
Stayer	ref.	ref.	ref.	ref.
Switcher	0.06***	0.03***	0.18***	0.07***
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

$log(BB/Q2)$: subsample of 19,949 individuals with at least one S2 specialist consultation

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 and among regions

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

Figure 5: Number of MGEN enrollees who retired in 2010, 2011 and 2012, by age